

HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use LYNPARZA safely and effectively. See full prescribing information for LYNPARZA.

LYNPARZA® (olaparib) tablets, for oral use
Initial U.S. Approval: 2014

RECENT MAJOR CHANGES

Indications and Usage (1.1, 1.4)	12/2018
Dosage and Administration (2.1, 2.2)	12/2018
Warnings and Precautions (5)	12/2018

INDICATIONS AND USAGE

Lynparza is a poly (ADP-ribose) polymerase (PARP) inhibitor indicated: Ovarian cancer

- for the maintenance treatment of adult patients with deleterious or suspected deleterious germline or somatic *BRCA*-mutated (*gBRCAm* or *sBRCAm*) advanced epithelial ovarian, fallopian tube or primary peritoneal cancer who are in complete or partial response to first-line platinum-based chemotherapy. Select patients with *gBRCAm* advanced epithelial ovarian, fallopian tube or primary peritoneal cancer for therapy based on an FDA-approved companion diagnostic for Lynparza. (1.1, 2.1)
- for the maintenance treatment of adult patients with recurrent epithelial ovarian, fallopian tube or primary peritoneal cancer, who are in complete or partial response to platinum-based chemotherapy. (1.2)
- for the treatment of adult patients with deleterious or suspected deleterious germline *BRCA*-mutated (*gBRCAm*) advanced ovarian cancer who have been treated with three or more prior lines of chemotherapy. Select patients for therapy based on an FDA-approved companion diagnostic for Lynparza. (1.3, 2.1)

Breast cancer

- in patients with deleterious or suspected deleterious *gBRCAm*, human epidermal growth factor receptor 2 (HER2)-negative metastatic breast cancer who have been treated with chemotherapy in the neoadjuvant, adjuvant or metastatic setting. Patients with hormone receptor (HR)-positive breast cancer should have been treated with a prior endocrine therapy or be considered inappropriate for endocrine therapy. Select patients for therapy based on an FDA-approved companion diagnostic for Lynparza. (1.4, 2.1)

DOSAGE AND ADMINISTRATION

- Recommended tablet dose is 300 mg taken orally twice daily with or without food. (2.2)
- For adverse reactions, consider dose interruption or dose reduction. (2.3)

- For moderate renal impairment (CL_{cr} 31-50 mL/min), reduce dose to 200 mg twice daily. (2.5)

DOSAGE FORMS AND STRENGTHS

Tablets: 150 mg, 100 mg (3)

CONTRAINDICATIONS

None. (4)

WARNINGS AND PRECAUTIONS

- Myelodysplastic Syndrome/Acute Myeloid Leukemia (MDS/AML): Occurred in <1.5% of patients exposed to Lynparza monotherapy and the majority of events had a fatal outcome. Monitor patients for hematological toxicity at baseline and monthly thereafter. Discontinue if MDS/AML is confirmed. (5.1)
- Pneumonitis: Occurred in <1% of patients exposed to Lynparza, and some cases were fatal. Interrupt treatment if pneumonitis is suspected. Discontinue if pneumonitis is confirmed. (5.2)
- Embryo-Fetal Toxicity: Lynparza can cause fetal harm. Advise of the potential risk to a fetus and to use effective contraception. (5.3, 8.1, 8.3)

ADVERSE REACTIONS

- Most common adverse reactions (≥10%) in clinical trials were nausea, fatigue (including asthenia), anemia, vomiting, abdominal pain, dizziness, diarrhea, neutropenia, leukopenia, nasopharyngitis/upper respiratory tract infection/fluenza, respiratory tract infection, arthralgia/myalgia, dysgeusia, headache, dyspepsia, decreased appetite, constipation and stomatitis. (6.1)
- Most common laboratory abnormalities (≥25%) were decrease in hemoglobin, increase in mean corpuscular volume, decrease in lymphocytes, decrease in leukocytes, decrease in absolute neutrophil count, increase in serum creatinine and decrease in platelets. (6.1)

To report SUSPECTED ADVERSE REACTIONS, contact AstraZeneca at 1-800-236-9933 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

DRUG INTERACTIONS

- CYP3A Inhibitors: Avoid concomitant use of strong or moderate CYP3A inhibitors. If the inhibitor cannot be avoided, reduce the olaparib dose. (2.4, 7.2, 12.3)
- CYP3A Inducers: Avoid concomitant use of strong or moderate CYP3A inducers as decreased efficacy can occur. (7.3, 12.3)

USE IN SPECIFIC POPULATIONS

Lactation: Advise women not to breastfeed. (8.2)

See 17 for PATIENT COUNSELING INFORMATION and MEDICATION GUIDE.

Revised: 12/2018

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FULL PRESCRIBING INFORMATION

1 INDICATIONS AND USAGE

1.1 First-Line Maintenance Treatment of *BRCA*-mutated Advanced Ovarian Cancer

Lynparza is indicated for the maintenance treatment of adult patients with deleterious or suspected deleterious germline or somatic *BRCA*-mutated (*gBRCAm* or *sBRCAm*) advanced epithelial ovarian, fallopian tube or primary peritoneal cancer who are in complete or partial response to first-line platinum-based chemotherapy. Select patients with *gBRCAm* advanced epithelial ovarian, fallopian tube or primary peritoneal cancer for therapy based on an FDA-approved companion diagnostic for Lynparza [see [Dosage and Administration \(2.1\)](#)].

1.2 Maintenance Treatment of Recurrent Ovarian Cancer

Lynparza is indicated for the maintenance treatment of adult patients with recurrent epithelial ovarian, fallopian tube or primary peritoneal cancer, who are in complete or partial response to platinum-based chemotherapy.

1.3 Advanced *gBRCA*-mutated Ovarian Cancer After 3 or More Lines of Chemotherapy

Lynparza is indicated for the treatment of adult patients with deleterious or suspected deleterious *gBRCAm* advanced ovarian cancer who have been treated with three or more prior lines of chemotherapy. Select patients for therapy based on an FDA-approved companion diagnostic for Lynparza. [see [Dosage and Administration \(2.1\)](#)].

1.4 Germline *BRCA*-mutated HER2-negative Metastatic Breast Cancer

Lynparza is indicated in patients with deleterious or suspected deleterious *gBRCAm*, HER2-negative metastatic breast cancer, who have been treated with chemotherapy in the neoadjuvant, adjuvant, or metastatic setting. Patients with hormone receptor (HR)-positive breast cancer should have been treated with a prior endocrine therapy or be considered inappropriate for endocrine therapy. Select patients for therapy based on an FDA-approved companion diagnostic for Lynparza [see [Dosage and Administration \(2.1\)](#)].

2 DOSAGE AND ADMINISTRATION

2.1 Patient Selection

Information on FDA-approved tests for the detection of *BRCA*-mutations is available at <http://www.fda.gov/companiondiagnostics>.

*First-Line Maintenance Treatment of *BRCA*-mutated Advanced Ovarian Cancer*

Select patients with advanced ovarian cancer who are in complete or partial response to first-line platinum-based chemotherapy for maintenance treatment with Lynparza based on the presence of deleterious or suspected deleterious *gBRCAm* or *sBRCAm* [see [Indications and Usage \(1.1\)](#) and [Clinical](#)

[Studies \(14.2\)](#). An FDA-approved test for the detection of tumor *BRCA* gene mutation for the first-line maintenance treatment of advanced ovarian cancer is not currently available.

Advanced gBRCAm Ovarian Cancer

Select patients with advanced ovarian cancer with Lynparza based on the presence of deleterious or suspected deleterious gBRCA-mutation [see [Indications and Usage \(1.3\)](#) and [Clinical Studies \(14.2\)](#)].

gBRCAm HER2-negative Metastatic Breast Cancer

Select patients for the treatment of HER2-negative metastatic breast cancer with Lynparza based on the presence of deleterious or suspected deleterious gBRCA-mutation [see [Indications and Usage \(1.4\)](#) and [Clinical Studies \(14.3\)](#)].

2.2 Recommended Dosing

The recommended dose of Lynparza is 300 mg (two 150 mg tablets) taken orally twice daily, with or without food, for a total daily dose of 600 mg. The 100 mg tablet is available for dose reduction.

If a patient misses a dose of Lynparza, instruct patient to take their next dose at its scheduled time.

Instruct patients to swallow tablets whole. Do not chew, crush, dissolve, or divide tablet [see [How Supplied/Storage and Handling \(16.2\)](#)].

First-Line Maintenance Treatment of BRCA-mutated Advanced Ovarian Cancer

Continue treatment until disease progression, unacceptable toxicity, or completion of 2 years of treatment. Patients with a complete response (no radiological evidence of disease) at 2 years should stop treatment. Patients with evidence of disease at 2 years, who in the opinion of the treating healthcare provider can derive further benefit from continuous treatment, can be treated beyond 2 years.

Maintenance Treatment of Recurrent Ovarian Cancer

Continue treatment until disease progression or unacceptable toxicity.

Advanced gBRCA-mutated Ovarian Cancer

Continue treatment until disease progression or unacceptable toxicity.

Germline BRCA-mutated HER2-negative Metastatic Breast Cancer

Continue treatment until disease progression or unacceptable toxicity.

2.3 Dose Adjustments for Adverse Reactions

To manage adverse reactions, consider interruption of treatment or dose reduction. The recommended dose reduction is 250 mg (one 150 mg tablet and one 100 mg tablet) taken twice daily, for a total daily dose of 500 mg.

If a further dose reduction is required, then reduce to 200 mg (two 100 mg tablets) taken twice daily, for a total daily dose of 400 mg.

2.4 Dose Modifications for Use with CYP3A Inhibitors

Avoid concomitant use of strong or moderate CYP3A inhibitors and consider alternative agents with less CYP3A inhibition. If a strong CYP3A inhibitor must be co-administered, reduce the Lynparza dose to 100 mg (one 100 mg tablet) taken twice daily (equivalent to a total daily dose of 200 mg). If a moderate CYP3A inhibitor must be co-administered, reduce the Lynparza dose to 150 mg (one 150 mg tablet) taken twice daily (equivalent to a total daily dose of 300 mg) [see [Drug Interactions \(7.2\)](#) and [Clinical Pharmacology \(12.3\)](#)].

2.5 Dose Modifications for Patients with Renal Impairment

Patients with mild renal impairment (CL_{cr} 51-80 mL/min as estimated by Cockcroft-Gault equation) do not require an adjustment in Lynparza dosing. In patients with moderate renal impairment (CL_{cr} 31-50 mL/min) the recommended dose reduction is to 200 mg (two 100 mg tablets) twice daily, for a total daily dose of 400 mg. The pharmacokinetics of Lynparza have not been evaluated in patients with severe renal impairment or end-stage renal disease (CL_{cr} ≤30 mL/min) [see [Use in Specific Populations \(8.7\)](#) and [Clinical Pharmacology \(12.3\)](#)].

3 DOSAGE FORMS AND STRENGTHS

Tablets:

- 150 mg: green to green/grey, oval, bi-convex, film-coated, with debossment ‘OP150’ on one side and plain on the reverse side.
- 100 mg: yellow to dark yellow, oval, bi-convex, film-coated, with debossment ‘OP100’ on one side and plain on the reverse side.

4 CONTRAINDICATIONS

None.

5 WARNINGS AND PRECAUTIONS

5.1 Myelodysplastic Syndrome/Acute Myeloid Leukemia

Overall, the incidence of Myelodysplastic Syndrome/Acute Myeloid Leukemia (MDS/AML) in patients treated with Lynparza monotherapy in clinical trials, including long-term follow up, was <1.5% (26/2258) and the majority of events had a fatal outcome. Of these, 22/26 patients had a documented *BRCA* mutation, 2 patients had *gBRCA* wildtype and in 2 patients the *BRCA* mutation status was unknown. Additional cases of MDS/AML have been documented in patients treated with Lynparza in combination studies and in postmarketing reports. The duration of therapy with Lynparza in patients who developed secondary MDS/cancer-therapy related AML varied from <6 months to >2 years. All of these patients had received previous chemotherapy with platinum agents and/or other DNA damaging agents including radiotherapy. Some of these patients also had a history of more than one primary malignancy or of bone marrow dysplasia.

Do not start Lynparza until patients have recovered from hematological toxicity caused by previous chemotherapy (\leq Grade 1). Monitor complete blood count for cytopenia at baseline and monthly thereafter for clinically significant changes during treatment. For prolonged hematological toxicities, interrupt Lynparza and monitor blood counts weekly until recovery. If the levels have not recovered to Grade 1 or less after 4 weeks, refer the patient to a hematologist for further investigations, including bone marrow analysis and blood sample for cytogenetics. If MDS/AML is confirmed, discontinue Lynparza.

5.2 Pneumonitis

Pneumonitis, including fatal cases, occurred in $<1\%$ of patients treated with Lynparza. If patients present with new or worsening respiratory symptoms such as dyspnea, cough and fever, or a radiological abnormality occurs, interrupt Lynparza treatment and promptly assess the source of the symptoms. If pneumonitis is confirmed, discontinue Lynparza treatment and treat the patient appropriately.

5.3 Embryo-Fetal Toxicity

Lynparza can cause fetal harm when administered to a pregnant woman based on its mechanism of action and findings in animals. In an animal reproduction study, administration of olaparib to pregnant rats during the period of organogenesis caused teratogenicity and embryo-fetal toxicity at exposures below those in patients receiving the recommended human dose of 300 mg twice daily. Apprise pregnant women of the potential hazard to a fetus. Advise females of reproductive potential to use effective contraception during treatment and for 6 months following the last dose of Lynparza [see [Use in Specific Populations \(8.1, 8.3\)](#) and [Clinical Pharmacology \(12.1\)](#)].

Based on findings from genetic toxicity and animal reproduction studies, advise male patients with female partners of reproductive potential or who are pregnant to use effective contraception during treatment and for 3 months following the last dose of Lynparza [see [Use in Specific Populations \(8.1, 8.3\)](#)].

6 ADVERSE REACTIONS

The following adverse reactions are discussed elsewhere in the labeling:

- Myelodysplastic Syndrome/Acute Myeloid Leukemia [see [Warnings and Precautions \(5.1\)](#)]
- Pneumonitis [see [Warnings and Precautions \(5.2\)](#)]

6.1 Clinical Trial Experience

Because clinical trials are conducted under widely varying conditions, adverse reaction rates observed in the clinical trials of a drug cannot be directly compared to rates in the clinical trials of another drug and may not reflect the rates observed in practice.

Adverse reactions presented below were reported from clinical trials in 1467 patients with ovarian or breast cancer (1019 received Lynparza, 448 received placebo or active comparator). The safety profile of olaparib was consistent across these clinical trials.

First-Line Maintenance Treatment of *BRCA*-mutated Advanced Ovarian Cancer

SOLO-1

The safety of Lynparza for the maintenance treatment of patients with *BRCA*-mutated advanced ovarian cancer following first-line treatment with platinum-based chemotherapy was investigated in SOLO-1, a placebo-controlled, double-blind study in which 390 patients received either Lynparza 300 mg BID (n=260) or placebo tablets (n=130) until disease progression or unacceptable toxicity. The median duration of study treatment was 25 months for patients who received Lynparza and 14 months for patients who received placebo.

Dose interruptions due to an adverse reaction of any grade occurred in 52% of patients receiving Lynparza and 17% of those receiving placebo; dose reductions due to an adverse reaction occurred in 28% of Lynparza patients and 3% of placebo patients. The most frequent adverse reactions leading to dose interruption or reduction of Lynparza were anemia (23%), nausea (14%), and vomiting (10%). Discontinuation due to adverse reactions occurred in 12% of Lynparza patients and 2% in placebo patients. Specific adverse reactions that most frequently led to discontinuation in patients treated with Lynparza were fatigue (3.1%), anemia (2.3%), and nausea (2.3%).

Table 1 Adverse Reactions^a Occurring in ≥10% of Patients Treated with Lynparza versus Placebo in SOLO-1

Adverse Reaction	Lynparza (n=260)		Placebo (n=130)	
	All Grades (%)	Grades 3 – 4 (%)	All Grades (%)	Grades 3 – 4 (%)
General Disorders and Administration Site Conditions				
Fatigue ^b	67	4	42	2
Blood and Lymphatic System Disorders				
Anemia	38	21	9	2
Neutropenia ^c	17	6	7	3
Leukopenia ^d	13	3	8	0
Thrombocytopenia ^e	11	1	4	2
Gastrointestinal Disorders				
Nausea	77	1	38	0
Vomiting	40	0	15	1
Abdominal pain ^f	45	2	35	1
Diarrhea ^g	37	3	26	0
Dyspepsia	17	0	12	0
Constipation	28	0	19	0
Stomatitis ^h	11	0	2	0
Infections and Infestations				

Adverse Reaction	Lynparza (n=260)		Placebo (n=130)	
	All Grades (%)	Grades 3 – 4 (%)	All Grades (%)	Grades 3 – 4 (%)
Upper respiratory tract infection/influenza/nasopharyngitis/bronchitis	28	0	23	0
UTI ⁱ	13	1	7	0
Metabolism and Nutrition Disorders				
Decreased appetite	20	0	10	0
Respiratory, Thoracic and Mediastinal Disorders				
Dyspnea ^j	15	0	6	0
Nervous System Disorders				
Dysgeusia	26	0	4	0
Dizziness	20	0	15	1

a. Graded according to the National Cancer Institute Common Terminology Criteria for Adverse Events (NCI CTCAE), version 4.0.

b. Includes asthenia, fatigue, lethargy, malaise

c. Includes neutropenia, febrile neutropenia

d. Includes leukopenia, white blood cell count decreased

e. Includes: platelet count decreased, thrombocytopenia

f. Includes abdominal pain, abdominal pain lower, abdominal pain upper, abdominal distension, abdominal discomfort, abdominal tenderness

g. Includes colitis, diarrhea, gastroenteritis

h. Includes stomatitis, aphthous ulcer; mouth ulceration

i. Includes: urosepsis, urinary tract infection, urinary tract pain, pyuria

j. Includes dyspnea and dyspnea exertional

In addition, the adverse reactions observed in SOLO-1 that occurred in <10% of patients receiving Lynparza were blood creatinine increased (8%), lymphopenia (6%), hypersensitivity (2%), dermatitis (1%), and mean cell volume increased (0.4%).

Table 2 Laboratory Abnormalities Reported in ≥25% of Patients in SOLO-1

Laboratory Parameter ^a	Lynparza tablets n ^b =260		Placebo n ^b =130	
	Grades 1-4 %	Grades 3-4 %	Grades 1-4 %	Grades 3-4 %
Decrease in hemoglobin	87	19	63	2
Increase in Mean corpuscular volume	87	0	43	0
Decrease in leukocytes	70	7	52	1

Decrease in lymphocytes	67	14	29	5
Decrease in absolute neutrophil count	51	9	38	6
Increase in serum creatinine	34	0	18	0
Decrease in platelets	35	1	20	2

a. Patients were allowed to enter clinical studies with laboratory values of CTCAE Grade 1.

b. This number represents the safety population. The derived values in the table are based on the total number of evaluable patients for each laboratory parameter.

Maintenance Treatment of Recurrent Ovarian Cancer

SOLO-2

The safety of Lynparza for the maintenance treatment of patients with platinum sensitive *gBRCAm* ovarian cancer was investigated in SOLO-2. This study was a placebo-controlled, double-blind study in which 294 patients received either Lynparza 300 mg (2 x 150 mg tablets) twice daily (n=195) or placebo tablets twice daily (n=99) until disease progression or unacceptable toxicity. The median duration of study treatment was 19.4 months for patients who received Lynparza and 5.6 months for patients who received placebo. Dose interruptions due to an adverse reaction of any grade occurred in 45% of patients receiving Lynparza and 18% of those receiving placebo; dose reductions due to an adverse reaction occurred in 27% of Lynparza patients and 3% of placebo patients. The most frequent adverse reactions leading to dose interruption or reduction of Lynparza were anemia (22%), neutropenia (9%), and fatigue/asthenia (8%). Discontinuation occurred in 11% of Lynparza patients and 2% in placebo patients.

Table 3 summarizes the adverse reactions that occurred in at least 20% of patients who received Lynparza in SOLO-2. Table 4 presents the laboratory abnormalities that occurred in at least 25% of patients who received Lynparza in SOLO-2.

Table 3 Adverse Reactions^a in SOLO-2 (≥20% of Patients Who Received Lynparza)

Adverse Reactions	Lynparza tablets n=195		Placebo n=99	
	Grades 1-4 %	Grades 3-4 %	Grades 1-4 %	Grades 3-4 %
Blood and lymphatic disorders				
Anemia ^b	44	20	9	2
Gastrointestinal disorders				
Nausea	76	3	33	0
Vomiting	37	3	19	1
Diarrhea	33	2	22	0
Stomatitis ^c	20	1	16	0
Infections and Infestations				
Nasopharyngitis/URI/sinusitis/ rhinitis/influenza	36	0	29	0
General disorders and administration site conditions				
Fatigue including asthenia	66	4	39	2

Metabolism and nutrition disorders				
Decreased appetite	22	0	11	0
Musculoskeletal and connective tissue disorder				
Arthralgia/myalgia	30	0	28	0
Nervous system disorders				
Dysgeusia	27	0	7	0
Headache	26	1	14	0

- a. Graded according to the National Cancer Institute Common Terminology Criteria for Adverse Events (NCI CTCAE), version 4.0.
- b. Represents grouped term consisting of anemia, hematocrit decreased, hemoglobin decreased, iron deficiency, mean cell volume increased and red blood cell count decreased.
- c. Represents grouped term consisting of abscess oral, aphthous ulcer, gingival abscess, gingival disorder, gingival pain, gingivitis, mouth ulceration, mucosal infection, mucosal inflammation, oral candidiasis, oral discomfort, oral herpes, oral infection, oral mucosal erythema, oral pain, oropharyngeal discomfort, and oropharyngeal pain.

In addition, the adverse reactions observed in SOLO-2 that occurred in <20% of patients receiving Lynparza were neutropenia (19%), cough (18%), leukopenia (16%), hypomagnesemia (14%), thrombocytopenia (14%), dizziness (13%), dyspepsia (11%), increase in creatinine (11%), edema (8%), rash (6%), and lymphopenia (1%).

Table 4 Laboratory Abnormalities Reported in ≥25% of Patients in SOLO-2

Laboratory Parameter ^a	Lynparza tablets n ^b =195		Placebo n ^b =99	
	Grades 1-4 %	Grades 3-4 %	Grades 1-4 %	Grades 3-4 %
Increase in mean corpuscular volume ^c	89	-	52	-
Decrease in hemoglobin	83	17	69	0
Decrease in leukocytes	69	5	48	1
Decrease in lymphocytes	67	11	37	1
Decrease in absolute neutrophil count	51	7	34	3
Increase in serum creatinine	44	0	29	0
Decrease in platelets	42	2	22	1

- a. Patients were allowed to enter clinical studies with laboratory values of CTCAE Grade 1.
- b. This number represents the safety population. The derived values in the table are based on the total number of evaluable patients for each laboratory parameter.
- c. Represents the proportion of subjects whose mean corpuscular volume was > upper limit of normal (ULN).

Study 19

The safety of Lynparza capsules as maintenance monotherapy was also evaluated in patients with platinum sensitive ovarian cancer who had received 2 or more previous platinum containing regimens in Study 19, a randomized, placebo-controlled, double-blind, multi-center study in which 264 patients received Lynparza 400 mg twice daily (n=136) or placebo (n=128). At the time of final analysis, the

median duration of exposure was 8.7 months in patients who received Lynparza and 4.6 months in patients who received placebo.

Adverse reactions led to dose interruptions in 35% of those receiving Lynparza and 10% of those receiving placebo; dose reductions in 26% of Lynparza and 4% of placebo; and discontinuation in 6% of Lynparza and 2% in placebo.

Table 5 summarizes the adverse reactions that occurred in at least 20% of patients who received Lynparza in Study 19. Table 6 presents the laboratory abnormalities that occurred in at least 25% of patients from Study 19.

Table 5 Adverse Reactions^a in Study 19 (≥20% of Patients Who Received Lynparza)

Adverse Reactions	Lynparza capsules n=136		Placebo n=128	
	Grades 1-4 %	Grades 3-4 %	Grades 1-4 %	Grades 3-4 %
Blood and lymphatic disorders				
Anemia ^b	23	7	7	1
Gastrointestinal disorders				
Nausea	71	2	36	0
Vomiting	35	2	14	1
Diarrhea	28	2	25	2
Constipation	22	1	12	0
Dyspepsia	20	0	9	0
General disorders and administration site conditions				
Fatigue (including asthenia)	63	9	46	3
Infections and infestations				
Respiratory tract infection	22	2	11	0
Metabolism and nutrition disorders				
Decreased appetite	21	0	13	0
Nervous system disorders				
Headache	21	0	13	1

^a Graded according to NCI CTCAE v4.0.

^b Represents grouped terms of related terms that reflect the medical concept of the adverse reaction.

In addition, the adverse reactions in Study 19 that occurred in <20% of patients receiving Lynparza were dysgeusia (16%), dizziness (15%), dyspnea (13%), pyrexia (10%), stomatitis (9%), edema (9%), increase in creatinine (7%), neutropenia (5%), thrombocytopenia (4%), leukopenia (2%), and lymphopenia (1%).

Table 6 Laboratory Abnormalities Reported in ≥25% of Patients in Study 19

Laboratory Parameter ^a	Lynparza capsules n ^b =136		Placebo n ^b =129	
	Grades 1-4 %	Grades 3-4 %	Grades 1-4 %	Grades 3-4 %
Decrease in hemoglobin	82	8	58	1
Increase in mean corpuscular volume ^c	82	-	51	-
Decrease in leukocytes	58	4	37	2
Decrease in lymphocytes	52	10	32	3
Decrease in absolute neutrophil count	47	7	40	2
Increase in serum creatinine	45	0	14	0
Decrease in platelets	36	4	18	0

^a Patients were allowed to enter clinical studies with laboratory values of CTCAE Grade 1.

- b. This number represents the safety population. The derived values in the table are based on the total number of evaluable patients for each laboratory parameter.
- c. Represents the proportion of subjects whose mean corpuscular volume was > ULN.

Treatment of Advanced *gBRCAm* Ovarian Cancer After 3 or More Lines of Chemotherapy

Pooled data

Treatment with Lynparza (capsule formulation) as monotherapy was studied in 223 patients (pooled from 6 studies) with *gBRCAm* advanced ovarian cancer who had received 3 or more prior lines of chemotherapy. Adverse reactions led to dose interruption in 40% of patients, dose reduction in 4% of patients, and discontinuation in 7% of patients. There were 8 (4%) patients with adverse reactions leading to death, two were attributed to acute leukemia, and one each was attributed to COPD, cerebrovascular accident, intestinal perforation, pulmonary embolism, sepsis, and suture rupture. The median exposure to Lynparza capsules in these patients was 5.2 months.

Table 7 presents adverse reactions reported in $\geq 20\%$ of patients and Table 8 presents laboratory abnormalities that occurred in at least 25% of patients from the pooled studies.

Table 7 Adverse Reactions Reported in Pooled Data ($\geq 20\%$ of Patients Who Received Lynparza)

Adverse Reactions	3 or more lines of prior Chemotherapy	
	Grades 1-4 n=223 (%)	Grades 3-4 n=223 (%)
Blood and Lymphatic disorders		
Anemia	34	18
Gastrointestinal disorders		
Decreased appetite	22	1
Nausea	64	3
Vomiting	43	4
Diarrhea	31	1
Dyspepsia	25	0
General disorders		
Fatigue/asthenia	66	8
Infections and infestations		
Nasopharyngitis/URI	26	0
Musculoskeletal and Connective Tissue disorders		
Arthralgia/musculoskeletal pain	21	0
Myalgia	22	0

Table 8 Laboratory Abnormalities Reported ≥25% of Patients in Pooled Data

Laboratory Parameter ^a	3 or more lines of prior Chemotherapy	
	Grades 1-4 n ^b =223 (%)	Grades 3-4 n ^b =223 (%)
Decrease in hemoglobin	90	15
Decrease in absolute neutrophil count	25	7
Decrease in platelets	30	3
Decrease in lymphocytes	56	17
Mean corpuscular volume elevation	57	-
Increase in creatinine	30	2

^{a.} Patients were allowed to enter clinical studies with laboratory values of CTCAE Grade 1.

^{b.} This number represents the safety population. The derived values in the table are based on the total number of evaluable patients for each laboratory parameter.

The following adverse reactions and laboratory abnormalities have been identified in ≥10 to <20% of the 223 patients receiving Lynparza and not included in the table: cough (16%), constipation (16%), dysgeusia (16%), headache (15%), peripheral edema (14%), back pain (14%), urinary tract infection (14%), dyspnea (13%) and dizziness (11%).

The following adverse reactions and laboratory abnormalities have been identified in <10% of the 223 patients receiving Lynparza and not included in the table: leukopenia (9%), pyrexia (8%), peripheral neuropathy (5%), hypomagnesemia (5%), rash (5%), stomatitis (4%) and venous thrombosis (including pulmonary embolism) (1%).

Treatment of gBRCAm HER2-negative Metastatic Breast Cancer

OlympiAD

The safety of Lynparza tablets as monotherapy was also evaluated in gBRCAm patients with HER2-negative metastatic breast cancer who had previously received up to two lines of chemotherapy for the treatment of metastatic disease in OlympiAD. This study was a randomized, open-label, multi-center study in which 296 patients received either Lynparza 300 mg twice daily (n=205) or a chemotherapy (capecitabine, eribulin, or vinorelbine) of the healthcare provider's choice (n=91) until disease progression or unacceptable toxicity. The median duration of study treatment was 8.2 months in patients who received Lynparza and 3.4 months in patients who received chemotherapy. Dose interruptions due to an adverse reaction of any grade occurred in 35% of patients receiving Lynparza and 28% of those receiving chemotherapy; dose reductions due to an adverse reaction occurred in 25% of Lynparza patients and 31% of chemotherapy patients. Discontinuation occurred in 5% of Lynparza patients and 8% in chemotherapy patients.

Table 9 summarizes the adverse reactions that occurred in at least 20% of patients who received Lynparza in OlympiAD. Table 10 presents the laboratory abnormalities that occurred in at least 25% of patients who received Lynparza in OlympiAD.

Table 9 Adverse Reactions^a in OlympiAD (≥20% of Patients Who received Lynparza)

Adverse Reactions	Lynparza tablets n=205		Chemotherapy n=91	
	Grades 1-4 %	Grades 3-4 %	Grades 1-4 %	Grades 3-4 %
Blood and lymphatic disorders				
Anemia ^b	40	16	26	4
Leukopenia ^c	25	5	31	13
Neutropenia ^d	27	9	50	26
Gastrointestinal disorders				
Nausea	58	0	35	1
Vomiting	30	0	15	1
Diarrhea	21	1	22	0
Infections and infestations				
Respiratory tract infection ^e	27	1	22	0
General disorders and administration site conditions				
Fatigue (including asthenia)	37	4	36	1
Nervous system disorders				
Headache	20	1	15	2

a. Graded according to NCI CTCAE v4.0.

b. Represents grouped terms consisting of anemia (anemia erythropenia, hematocrit decreased, hemoglobin decreased and red blood cell count decreased).

c. Represents grouped terms consisting of leukopenia (leukopenia and white blood cell count decreased).

d. Represents grouped terms consisting of neutropenia (febrile neutropenia, granulocyte count decreased, granulocytopenia, neutropenia, neutropenic infection, neutropenic sepsis, neutrophil count decreased).

e. Represents grouped terms consisting of bronchitis, influenza, lower respiratory tract infection, nasopharyngitis, pharyngitis, respiratory tract infection, rhinitis, sinusitis, upper respiratory tract infection, and upper respiratory tract infection bacterial.

In addition, adverse reactions in OlympiAD that occurred in <20% of patients receiving Lynparza were cough (18%), decreased appetite (16%), thrombocytopenia (11%), dysgeusia (9%), lymphopenia (8%), dyspepsia (8%), dizziness (7%), stomatitis (7%), upper abdominal pain (7%), rash (5%), increase in serum creatinine (3%) and dermatitis (1%).

Table 10 Laboratory Abnormalities Reported ≥25% of Patients in OlympiAD

Laboratory Parameter ^a	Lynparza tablets n ^b = 205		Chemotherapy n ^b = 91	
	Grades 1-4 %	Grades 3-4 %	Grades 1-4 %	Grades 3-4 %
Increase in mean corpuscular volume ^c	71	-	33	-
Decrease in hemoglobin	82	17	66	3
Decrease in leukocytes	71	8	70	23
Decrease in lymphocytes	73	21	63	3
Decrease in absolute neutrophil count	46	11	65	38
Decrease in platelets	33	3	28	0

- a. Patients were allowed to enter clinical studies with laboratory values of CTCAE Grade 1.
- b. This number represents the safety population. The derived values in the table are based on the total number of evaluable patients for each laboratory parameter.
- c. Represents the proportion of subjects whose mean corpuscular volume was > ULN.

6.2 Postmarketing Experience

The following adverse reactions have been identified during post-approval use of Lynparza. 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.

Immune System Disorders: Hypersensitivity (rash/dermatitis).

7 DRUG INTERACTIONS

7.1 Anticancer Agents

Clinical studies of Lynparza in combination with other myelosuppressive anticancer agents, including DNA damaging agents, indicate a potentiation and prolongation of myelosuppressive toxicity.

7.2 Drugs That May Increase Olaparib Plasma Concentrations

Olaparib is primarily metabolized by CYP3A. In patients (n=57), co-administration of itraconazole, a strong CYP3A inhibitor, increased AUC of olaparib by 170%. A moderate CYP3A inhibitor, fluconazole, is predicted to increase the AUC of olaparib by 121%.

Avoid concomitant use of strong CYP3A inhibitors such as itraconazole, telithromycin, clarithromycin, ketoconazole, voriconazole, nefazodone, posaconazole, ritonavir, lopinavir/ritonavir, indinavir, saquinavir, nelfinavir, boceprevir, telaprevir or moderate CYP3A inhibitors such as amprenavir, aprepitant, atazanavir, ciprofloxacin, crizotinib, darunavir/ritonavir, diltiazem, erythromycin, fluconazole, fosamprenavir, imatinib, verapamil. If the strong or moderate CYP3A inhibitors must be co-administered, reduce the dose of Lynparza [*see [Dosage and Administration \(2.5\)](#)*].

Avoid grapefruit, grapefruit juice, Seville oranges, and Seville orange juice during Lynparza treatment since they are CYP3A inhibitors [*see [Dosage and Administration \(2.5\)](#) and [Clinical Pharmacology \(12.3\)](#)*].

7.3 Drugs That May Decrease Olaparib Plasma Concentrations

In patients (n=22), co-administration of rifampicin, a strong CYP3A inducer, decreased AUC of olaparib by 87%. A moderate CYP3A inducer, efavirenz, is predicted to decrease the AUC of olaparib by approximately 60%.

Avoid concomitant use of strong CYP3A inducers such as phenytoin, rifampicin, carbamazepine, and St. John's Wort or moderate CYP3A4 inducers such as bosentan, efavirenz, etravirine, modafinil, and nafcillin. If a moderate CYP3A inducer cannot be avoided, there is a potential for decreased efficacy of Lynparza [*see [Clinical Pharmacology \(12.3\)](#)*].

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Risk Summary

Based on findings in animals and its mechanism of action [see [Clinical Pharmacology \(12.1\)](#)], Lynparza can cause fetal harm when administered to a pregnant woman. There are no available data on Lynparza use in pregnant women to inform the drug-associated risk. In an animal reproduction study, the administration of olaparib to pregnant rats during the period of organogenesis caused teratogenicity and embryo-fetal toxicity at exposures below those in patients receiving the recommended human dose of 300 mg twice daily [see *Data*]. Apprise pregnant women of the potential hazard to the fetus and the potential risk for loss of the pregnancy.

The estimated background risk of major birth defects and miscarriage for the indicated population is unknown. The estimated background risk in the U.S. general population of major birth defects is 2-4%; and the risk for spontaneous abortion is approximately 15-20% in clinically recognized pregnancies.

Data

Animal Data

In a fertility and early embryonic development study in female rats, olaparib was administered orally for 14 days before mating through to Day 6 of pregnancy, which resulted in increased post-implantation loss at a dose level of 15 mg/kg/day (with maternal systemic exposures approximately 7% of the human exposure (AUC_{0-24h}) at the recommended dose).

In an embryo-fetal development study, pregnant rats received oral doses of 0.05 and 0.5 mg/kg/day olaparib during the period of organogenesis. A dose of 0.5 mg/kg/day (with maternal systemic exposures approximately 0.18% of human exposure (AUC_{0-24h}) at the recommended dose) caused embryo-fetal toxicities including increased post-implantation loss and major malformations of the eyes (anophthalmia, microphthalmia), vertebrae/ribs (extra rib or ossification center; fused or absent neural arches, ribs, and sternbrae), skull (fused exoccipital) and diaphragm (hernia). Additional abnormalities or variants included incomplete or absent ossification (vertebrae/sternbrae, ribs, limbs) and other findings in the vertebrae/sternbrae, pelvic girdle, lung, thymus, liver, ureter and umbilical artery. Some findings noted above in the eyes, ribs and ureter were observed at a dose of 0.05 mg/kg/day olaparib at lower incidence.

8.2 Lactation

Risk Summary

No data are available regarding the presence of olaparib in human milk, or on its effects on the breastfed infant or on milk production. Because of the potential for serious adverse reactions in the breastfed infants from Lynparza, advise a lactating woman not to breastfeed during treatment with Lynparza and for one month after receiving the last dose.

8.3 Females and Males of Reproductive Potential

Pregnancy Testing

Pregnancy testing is recommended for females of reproductive potential prior to initiating treatment with Lynparza.

Contraception

Females

Lynparza can cause fetal harm when administered to a pregnant woman [see [Use in Specific Populations \(8.1\)](#)]. Advise females of reproductive potential to use effective contraception during treatment with Lynparza and for at least 6 months following the last dose.

Males

Based on findings in genetic toxicity and animal reproduction studies, advise male patients with female partners of reproductive potential or who are pregnant to use effective contraception during treatment and for 3 months following the last dose of Lynparza. Advise male patients not to donate sperm during therapy and for 3 months following the last dose of Lynparza [see [Use in Specific Populations \(8.1\)](#) and [Nonclinical Toxicology \(13.1\)](#)].

8.4 Pediatric Use

The safety and efficacy of Lynparza have not been established in pediatric patients.

8.5 Geriatric Use

In clinical studies of Lynparza enrolling 687 patients with advanced solid tumors who received Lynparza tablets 300 mg twice daily as monotherapy, 146 (21%) patients were aged ≥ 65 years, and this included 29 (4%) patients who were aged ≥ 75 years. No patients were aged ≥ 85 years. No overall differences in the safety or effectiveness of Lynparza were observed between younger and older patients.

8.6 Hepatic Impairment

No adjustment to the starting dose is required in patients with mild or moderate hepatic impairment. A 15% increase and an 8% increase in mean exposure (AUC), respectively, were observed in patients with mild and moderate hepatic impairment (Child-Pugh classification A and B) compared to patients with normal hepatic function. There are no data in patients with severe hepatic impairment (Child-Pugh classification C) [see [Clinical Pharmacology \(12.3\)](#)].

8.7 Renal Impairment

No adjustment to the starting dose is required in patients with mild renal impairment, but patients should be monitored closely for toxicity. A 24% increase in mean exposure (AUC) was observed in patients with mild renal impairment ($CL_{Cr}=51-80$ mL/min) compared to patients with normal renal function ($CL_{Cr} > 80$ mL/min). A 44% increase in AUC was observed in patients with moderate renal impairment ($CL_{Cr}=31-50$ mL/min) compared to patients with normal renal function ($CL_{Cr} > 80$ mL/min). For patients with moderate renal impairment, reduce the dose of Lynparza to 200 mg twice daily [see [Dosage and Administration \(2.6\)](#)]. There are no data in patients with severe renal impairment or end-stage disease ($CL_{Cr} \leq 30$ mL/min) [see [Clinical Pharmacology \(12.3\)](#)].

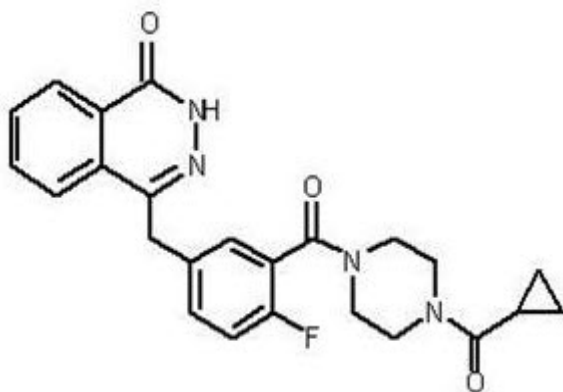
10 OVERDOSAGE

There is no specific treatment in the event of Lynparza overdose, and symptoms of overdose are not established. In the event of an overdose, physicians should follow general supportive measures and should treat the patient symptomatically.

11 DESCRIPTION

Olaparib is an inhibitor of the mammalian polyadenosine 5'-diphosphoribose polymerase (PARP) enzyme.

The chemical name is 4-[(3-{[4-(cyclopropylcarbonyl)piperazin-1-yl]carbonyl}-4-fluorophenyl)methyl]phthalazin-1(2H)-one and it has the following chemical structure:



The empirical molecular formula for Lynparza is $C_{24}H_{23}FN_4O_3$ and the relative molecular mass is 434.46.

Olaparib is a crystalline solid, is non-chiral and shows pH-independent low solubility across the physiological pH range.

Lynparza tablets for oral administration contain 100 mg or 150 mg of olaparib. Inactive ingredients in the tablet core are copovidone, mannitol, colloidal silicon dioxide and sodium stearyl fumarate. The tablet coating consists of hypromellose, polyethylene glycol 400, titanium dioxide, ferric oxide yellow and ferrosoferric oxide (150 mg tablet only).

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

Lynparza is an inhibitor of poly (ADP-ribose) polymerase (PARP) enzymes, including PARP1, PARP2, and PARP3. PARP enzymes are involved in normal cellular functions, such as DNA transcription and DNA repair. Olaparib has been shown to inhibit growth of select tumor cell lines *in vitro* and decrease tumor growth in mouse xenograft models of human cancer, both as monotherapy or following platinum-based chemotherapy. Increased cytotoxicity and anti-tumor activity following treatment with olaparib were noted in cell lines and mouse tumor models with deficiencies in BRCA and non-BRCA proteins involved in the homologous recombination repair (HRR) of DNA damage and correlated with platinum

response. *In vitro* studies have shown that olaparib-induced cytotoxicity may involve inhibition of PARP enzymatic activity and increased formation of PARP-DNA complexes, resulting in DNA damage and cancer cell death.

12.2 Pharmacodynamics

Cardiac Electrophysiology

The effect of olaparib on cardiac repolarization was assessed in 119 patients following a single dose of 300 mg and in 109 patients following multiple dosing of 300 mg twice daily. No clinically relevant effect of olaparib on QT interval was observed.

12.3 Pharmacokinetics

The oral bioavailability of the tablet formulation is higher than the capsule formulation. Population pharmacokinetic analyses have shown that the steady state exposure (AUC) following 300 mg tablet twice daily was 77% higher compared to that following 400 mg capsule twice daily. The olaparib geometric mean AUC and C_{max} following a single 300 mg tablet dose were 42.0 $\mu\text{g}\cdot\text{h}/\text{mL}$ (n=204) and 5.8 $\mu\text{g}/\text{mL}$ (n=204), respectively, and the steady state geometric mean AUC and C_{max} following 300 mg tablet twice daily were 49.0 $\mu\text{g}\cdot\text{h}/\text{mL}$ (n=227) and 7.7 $\mu\text{g}/\text{mL}$ (n=227), respectively. Olaparib showed time-dependent PK that the steady state clearance decreased by 15% after multiple dosing.

Absorption

Following oral administration of olaparib, absorption is rapid with median peak plasma concentrations typically achieved 1.5 hours after dosing. An AUC mean accumulation ratio of 1.8 is observed at steady state following multiple dosing of 300 mg tablets twice daily.

Systemic exposure (single dose AUC) to olaparib increases approximately proportionally with doses over the dose range of 25 mg to 450 mg, C_{max} increased slightly less than proportionally for the same dose range.

Co-administration of a high fat meal with olaparib slowed the rate (t_{max} delayed by 2.5 hours) of absorption, but did not significantly alter the extent of olaparib absorption (mean AUC increased by approximately 8%).

Distribution

Olaparib had a mean (\pm standard deviation) apparent volume of distribution of 158 ± 136 L after a single 300 mg dose of olaparib. The *in vitro* protein binding of olaparib is approximately 82%.

Metabolism

In vitro, CYP3A4/5 were shown to be the enzymes primarily responsible for the metabolism of olaparib.

Following oral dosing of ^{14}C -olaparib to female patients, unchanged olaparib accounted for the majority of the circulating radioactivity in plasma (70%). It was extensively metabolized with unchanged drug accounting for 15% and 6% of radioactivity in urine and feces, respectively. The majority of the

metabolism is attributable to oxidation reactions with a number of the components produced undergoing subsequent glucuronide or sulfate conjugation.

Excretion

A mean (\pm standard deviation) terminal plasma half-life of 14.9 ± 8.2 hours and apparent plasma clearance of 7.4 ± 3.9 L/h were observed after a single 300 mg dose of olaparib.

Following a single dose of ^{14}C -olaparib, 86% of the dosed radioactivity was recovered within a 7-day collection period, 44% via the urine and 42% via the feces. The majority of the material was excreted as metabolites.

Drug Interactions

Based on the data from a drug-interaction trial (n=57), the AUC and C_{max} of olaparib increased by 170% and 42%, respectively, when olaparib was administered in combination with itraconazole, a strong CYP3A inhibitor. Simulations suggested that a moderate CYP3A inhibitor (fluconazole) may increase the AUC and C_{max} of olaparib by 121% and 14%, respectively.

Based on the data from a drug-interaction trial (n=22), the AUC and C_{max} of olaparib decreased by 87% and 71%, respectively, when olaparib was administered in combination with rifampicin, a strong CYP3A inducer. Simulations suggested that a moderate CYP3A inducer (efavirenz) may decrease the AUC and C_{max} of olaparib by approximately 60% and 31%, respectively.

In vitro studies have shown that olaparib is both an inhibitor and inducer of CYP3A and an inducer of CYP2B6. Olaparib is predicted to be a weak CYP3A inhibitor in humans. *In vitro* studies also indicated that olaparib is an inhibitor of UGT1A1, BCRP, OATP1B1, OCT1, OCT2, OAT3, MATE1 and MATE2K. The clinical relevance of these findings is unknown. *In vitro*, olaparib is a substrate of, and inhibits, the efflux transporter P-gp. The potential for olaparib to induce P-gp has not been evaluated.

Pharmacokinetics in Specific Populations

Hepatic Impairment

In a hepatic impairment trial, the mean AUC increased by 15% and the mean C_{max} increased by 13% when olaparib was dosed in patients with mild hepatic impairment (Child-Pugh classification A; n=10) and the mean AUC increased by 8% and the mean C_{max} decreased by 13% when olaparib was dosed in patients with moderate hepatic impairment (Child-Pugh classification B; n=8), compared to patients with normal hepatic function (n=13). Hepatic impairment had no effect on the protein binding of olaparib and, therefore, total plasma exposure was representative of free drug. There are no data in patients with severe hepatic impairment (Child-Pugh classification C).

Renal Impairment

In a renal impairment trial, the mean AUC increased by 24% and C_{max} by 15%, when olaparib was dosed in patients with mild renal impairment ($\text{CL}_{\text{cr}}=51\text{-}80$ mL/min defined by the Cockcroft-Gault equation; n=13) and by 44% and 26%, respectively, when olaparib was dosed in patients with moderate renal impairment ($\text{CL}_{\text{cr}}=31\text{-}50$ mL/min; n=13), compared to those with normal renal function ($\text{CL}_{\text{cr}} \geq 81$ mL/min; n=12). There was no evidence of a relationship between the extent of plasma protein binding of

olaparib and creatinine clearance. There are no data in patients with severe renal impairment or end-stage renal disease ($CL_{Cr} \leq 30$ mL/min).

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

Carcinogenicity studies have not been conducted with olaparib.

Olaparib was clastogenic in an *in vitro* chromosomal aberration assay in mammalian Chinese hamster ovary (CHO) cells and in an *in vivo* rat bone marrow micronucleus assay. This clastogenicity is consistent with genomic instability resulting from the primary pharmacology of olaparib and indicates potential for genotoxicity in humans. Olaparib was not mutagenic in a bacterial reverse mutation (Ames) test.

In a fertility study, female rats received oral olaparib at doses of 0.05, 0.5, and 15 mg/kg/day for at least 14 days before mating through the first week of pregnancy. There were no adverse effects on mating and fertility rates at doses up to 15 mg/kg/day (maternal systemic exposures approximately 7% of the human exposure (AUC_{0-24h}) at the recommended dose).

In a male fertility study, olaparib had no effect on mating and fertility in rats at oral doses up to 40 mg/kg/day following at least 70 days of olaparib treatment (with systemic exposures of approximately 5% of the human exposure (AUC_{0-24h}) at the recommended dose).

14 CLINICAL STUDIES

14.1 First-Line Maintenance Treatment of *BRCA*-mutated Advanced Ovarian Cancer

SOLO-1

SOLO-1 (NCT01844986) was a randomized, double-blind, placebo-controlled, multi-center trial that compared the efficacy of Lynparza with placebo in patients with *BRCA*-mutated (*BRCAm*) advanced ovarian, fallopian tube, or primary peritoneal cancer following first-line platinum-based chemotherapy in which 391 patients were randomized (2:1) to receive Lynparza tablets 300 mg orally twice daily ($n=260$) or placebo ($n=131$). Treatment was continued for up to 2 years or until disease progression or unacceptable toxicity; however, patients with evidence of disease at 2 years, who in the opinion of the treating healthcare provider could derive further benefit from continuous treatment, could be treated beyond 2 years. Randomization was stratified by response to first-line platinum-based chemotherapy (complete or partial response). The major efficacy outcome was investigator-assessed progression-free survival (PFS) evaluated according to Response Evaluation Criteria in Solid Tumors (RECIST), version 1.1.

The median age of patients treated with Lynparza was 53 years (range: 29 to 82) and 53 years (range: 31 to 84) among patients on placebo. The ECOG performance score was 0 in 77% of patients receiving Lynparza and 80% of patients receiving placebo. Of all patients, 82% were White, 36% were enrolled in the U.S. or Canada, and 82% were in complete response to their most recent platinum-based regimen. The majority of patients ($n=389$) had germline *BRCA* mutation (*gBRCAm*), and 2 patients had somatic *BRCAm* (*sBRCAm*).

Of the 391 patients randomized in SOLO-1, 386 were retrospectively or prospectively tested with BRACAnalysis Test and 383 patients were confirmed to have deleterious or suspected deleterious *gBRCAm* status; 253 were randomized to the Lynparza arm and 130 to the placebo arm. Two out of 391 patients randomized in SOLO-1 were confirmed to have *sBRCAm* only based on an investigational tissue assay.

SOLO-1 demonstrated a statistically significant improvement in investigator-assessed PFS for Lynparza compared to placebo. Results from a blinded independent review were consistent. At the time of the analysis of PFS, overall survival (OS) data were not mature (21% of patients had died).

Table 11 Efficacy Results – SOLO-1 (Investigator Assessment)

	Lynparza tablets (n=260)	Placebo (n=131)
Progression-Free Survival^a		
Number of events (%)	102 (39%)	96 (73%)
Median, months	NR	13.8
Hazard ratio ^b (95% CI)	0.30 (0.23-0.41)	
p-value ^c	<0.0001	

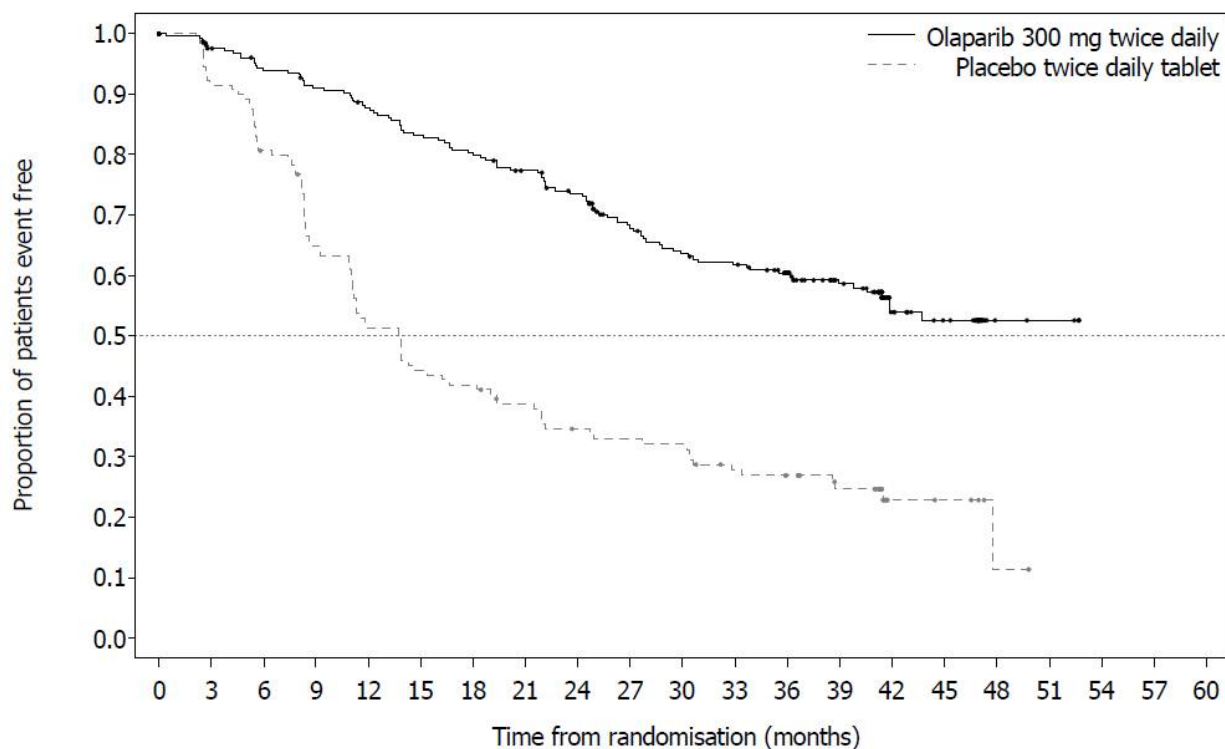
^{a.} Median follow up of 41 months in both treatment arms.

^{b.} A value <1 favors olaparib. Hazard ratio from a Cox proportional hazards model including response to previous platinum chemotherapy (complete response versus partial response) as a covariate.

^{c.} The p-value is derived from a stratified log-rank test.

NR not reached; CI Confidence Interval.

Figure 1 Kaplan-Meier Curves of Investigator-Assessed Progression-Free Survival-SOLO-1



Number of patients at risk:

Olaparib 300 mg twice daily tablet

260 240 229 221 212 201 194 184 172 149 138 133 111 88 45 36 4 3 0 0 0

Placebo twice daily tablet

131 118 103 82 65 56 53 47 41 39 38 31 28 22 6 5 1 0 0 0 0

14.2 Maintenance Treatment of Recurrent Ovarian Cancer

The efficacy of Lynparza was investigated in two randomized, placebo-controlled, double-blind, multi-center studies in patients with recurrent ovarian cancers who were in response to platinum-based therapy.

SOLO-2

SOLO-2 (NCT01874353) was a double-blind, placebo-controlled trial in which patients (n=295) with *gBRCAm* ovarian, fallopian tube, or primary peritoneal cancer were randomized (2:1) to receive Lynparza tablets 300 mg orally twice daily or placebo until unacceptable toxicity or progressive disease.

Randomization was stratified by response to last platinum chemotherapy (complete versus partial) and time to disease progression in the penultimate platinum-based chemotherapy prior to enrollment (6-12 months versus >12 months). All patients had received at least two prior platinum-containing regimens and were in response (complete or partial) to their most recent platinum-based regimen. All patients had a

deleterious or suspected deleterious germline *BRCA*-mutation as detected either by a local test (n=236) or central Myriad CLIA test (n=59), subsequently confirmed by BRACAnalysis CDx[®](n=286).

The major efficacy outcome measure was investigator-assessed PFS evaluated according to RECIST, version 1.1. An additional endpoint included OS.

The median age of patients treated with Lynparza was 56 years (range: 28 to 83) and 56 years (range: 39 to 78) among patients treated with placebo. The ECOG performance score was 0 in 83% of patients receiving Lynparza and 78% of patients receiving placebo. Of all patients, 89% were White, 17% were enrolled in the U.S. or Canada, 47% were in complete response to their most recent platinum-based regimen, and 40% had a progression-free interval of 6-12 months since their penultimate platinum regimen. Prior bevacizumab therapy was reported for 17% of those treated with Lynparza and 20% of those receiving placebo. Approximately 44% of patients on the Lynparza arm and 37% on placebo had received three or more lines of platinum-based treatment.

SOLO-2 demonstrated a statistically significant improvement in investigator-assessed PFS in patients randomized to Lynparza as compared with placebo (Table 12 and Figure 2). Results from a blinded independent review were consistent. At the time of the analysis of PFS, OS data were not mature with 24% of events.

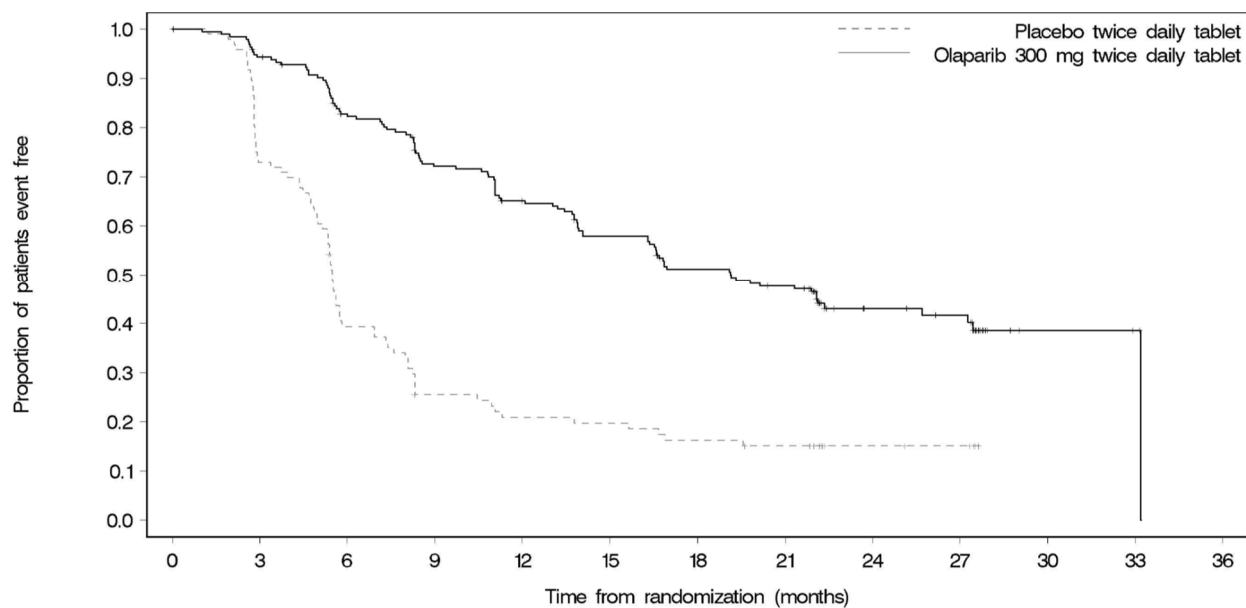
Table 12 Efficacy Results – SOLO-2 (Investigator Assessment)

	Lynparza tablets (n=196)	Placebo (n=99)
Progression-Free Survival		
Number of events (%)	107 (54.6%)	80 (80.8%)
Median, months	19.1	5.5
Hazard ratio ^a (95% CI)	0.30 (0.22, 0.41)	
p-value ^b	<0.0001	

^a. Hazard ratio from a Cox proportional hazards model including response to last platinum chemotherapy (complete response versus partial response) and time to disease progression in the penultimate platinum-based chemotherapy prior to enrollment (6-12 month versus >12 months) as covariates.

^b. The p-value is derived from a stratified log-rank test.

Figure 2 Kaplan-Meier Curves of Investigator-Assessed Progression-Free Survival – SOLO-2



Number of patients at risk:

Time (months)	0	3	6	9	12	15	18	21	24	27	30	33	36
Olaparib 300 mg twice daily tablet	196	182	156	134	118	104	89	82	32	29	3	2	0
Placebo twice daily tablet	99	70	37	22	18	17	14	12	7	6	0	0	0

Study 19

Study 19 (NCT00753545) was a double-blind, placebo-controlled trial in which patients (n=265) with platinum-sensitive ovarian cancer who had received 2 or more previous platinum-containing regimens were randomized (1:1) to receive Lynparza capsules 400 mg orally twice daily or placebo until unacceptable toxicity or progressive disease. Randomization was stratified by response to last platinum chemotherapy (CR versus PR), time to disease progression in the penultimate platinum-based chemotherapy (6-12 months versus >12 months), and descent (Jewish versus non-Jewish). The major efficacy outcome measure of the study was investigator-assessed PFS evaluated according to RECIST, version 1.0.

The median age of patients treated with Lynparza (n=136) was 58 years (range: 21 to 89) and 59 years (range 33 to 84) among patients treated with placebo (n=129). ECOG performance status was 0 in 81% of patients receiving Lynparza and 74% of patients receiving placebo. Of all patients, 97% were White, 19% were enrolled in the US or Canada, 45% were in complete response following their most recent platinum chemotherapy regimen, and 40% had a progression-free interval of 6-12 months since their penultimate platinum. Prior bevacizumab therapy was reported for 13% of patients receiving Lynparza and 16% of patients receiving placebo. A retrospective analysis for germline *BRCA* mutation status, some performed

using the Myriad test, indicated that 36% (n=96) of patients from the ITT population had deleterious *gBRCA* mutation, including 39% (n=53) of patients on Lynparza and 33% (n=43) of patients on placebo.

Study 19 demonstrated a statistically significant improvement in investigator-assessed PFS in patients treated with Lynparza versus placebo (Table 13 and Figure 3).

Table 13 Efficacy Results - Study 19 (Investigator Assessment)

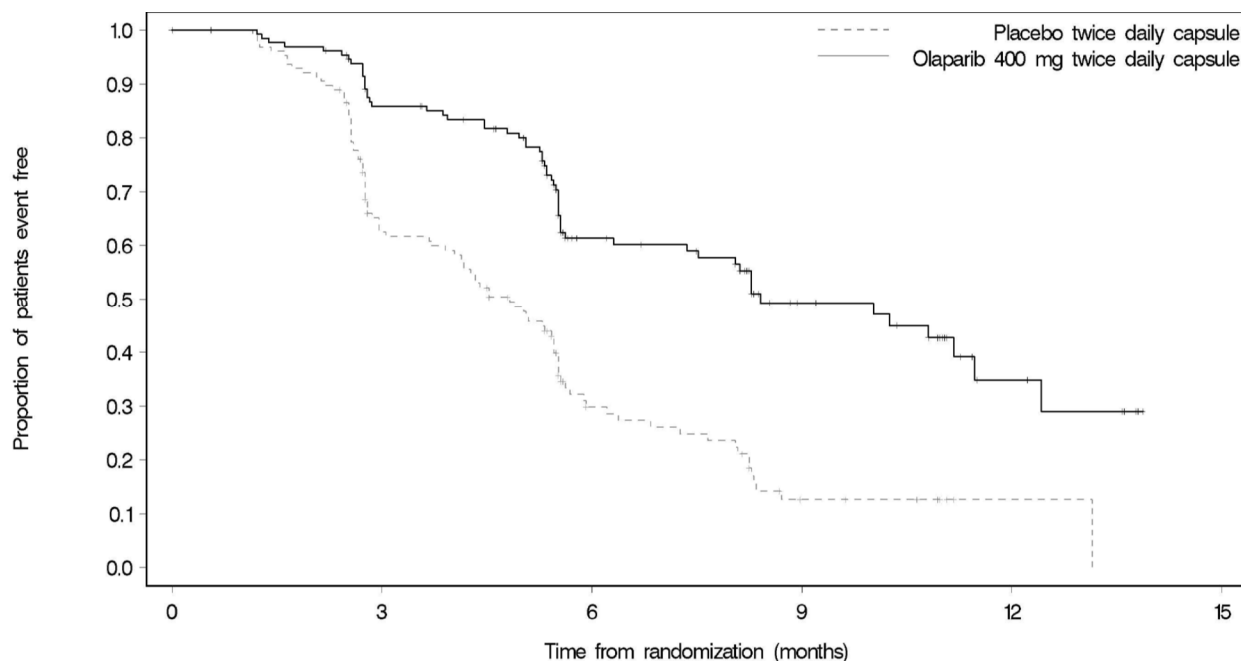
	Lynparza capsules (n=136)	Placebo (n=129)
Progression-Free Survival		
Number of events (%)	60 (44%)	94 (73%)
Median, months	8.4	4.8
Hazard ratio ^a (95% CI)	0.35 (0.25, 0.49)	
p-value ^b	<0.0001	
Overall Survival^c		
Number of events (%)	98 (72%)	112 (87%)
Median, months	29.8	27.8
Hazard ratio (95% CI)	0.73 (0.55, 0.95)	

a. Hazard ratio from a Cox proportional hazards model including response to last platinum chemotherapy (complete response versus partial response), time to disease progression in the penultimate platinum-based chemotherapy (6-12 months versus >12 months) and Jewish descent (yes versus no) as covariates.

b. The p-value is derived from a Cox proportional hazards model.

c. Without adjusting for multiple analyses.

Figure 3: Kaplan-Meier Curves of Investigator-Assessed Progression-Free Survival – Study 19



Number of patients at risk:

Olaparib 400 mg twice daily capsule	136	106	53	24	7	0
Placebo twice daily capsule	129	72	24	7	1	0

14.3 Advanced *gBRCA*-mutated Ovarian Cancer Treated with 3 or More Prior Lines of Chemotherapy

The efficacy of Lynparza was also investigated in a single-arm study of patients with deleterious or suspected deleterious *gBRCAm* advanced cancers. A total of 137 patients with measurable, advanced *gBRCAm* ovarian cancer treated with three or more prior lines of chemotherapy were enrolled. All patients received Lynparza capsules at a dose of 400 mg twice daily as monotherapy until disease progression or intolerable toxicity. Objective response rate (ORR) and duration of response (DOR) were assessed by the investigator according to RECIST, version 1.0.

The median age of the patients was 58 years, the majority were White (94%) and 93% had an ECOG PS of 0 or 1. Deleterious or suspected deleterious *gBRCAm* status was verified retrospectively in 97% (59/61) of the patients for whom blood samples were available by the BRCAanalysis CDx™. Efficacy results are summarized in Table 14.

Table 14 Overall Response and Duration of Response in Patients with gBRCA-mutated Advanced Ovarian Cancer Who Received 3 or More Lines of Chemotherapy

	n=137
Objective Response Rate (95% CI)	34% (26, 42)
Complete Response	2%
Partial Response	32%
Median DOR in months (95% CI)	7.9 (5.6, 9.6)

14.4 Treatment of gBRCAm HER2-negative Metastatic Breast Cancer

OlympiAD

OlympiAD (NCT02000622) was an open-label study in which patients (n=302) with gBRCAm HER2-negative metastatic breast cancer were randomized 2:1 to receive Lynparza 300 mg tablets or healthcare provider’s choice of chemotherapy (capecitabine, eribulin, or vinorelbine, at standard doses) until progression or unacceptable toxicity. Randomization was stratified by prior use of chemotherapy for metastatic disease (yes vs no), hormone receptor status (hormone receptor positive vs triple negative), and previous use of platinum-based chemotherapy (yes vs no). Patients were required to have received treatment with an anthracycline (unless contraindicated) and a taxane, in the neoadjuvant, adjuvant or metastatic setting. Patients with hormone receptor-positive disease must have progressed on at least 1 endocrine therapy (adjuvant or metastatic), or have disease that the treating healthcare provider believed to be inappropriate for endocrine therapy. Patients with prior platinum therapy were required to have no evidence of disease progress during platinum treatment. No prior treatment with a PARP inhibitor was permitted. Of the 302 patients randomized onto OlympiAD, 299 were tested with the BRACAnalysis CDx[®] and 297 were confirmed to have deleterious or suspected deleterious gBRCAm status; 202 were randomized to the Lynparza arm and 95 to the healthcare provider’s choice of chemotherapy arm.

Among the 205 patients treated with Lynparza, the median age was 44 years (range: 22 to 76), 65% were White, 4% were males and all the patients had an ECOG PS of 0 or 1. Approximately 50% of patients had triple-negative tumors and 50% had estrogen receptor and/or progesterone receptor positive tumors and the proportions were balanced across treatment arms. Patients in each treatment arm had received a median of 1 prior chemotherapy regimen for metastatic disease; approximately 30% had not received a prior chemotherapy regimen for metastatic breast cancer. Twenty-one percent of patients in the Lynparza arm and 14% in the chemotherapy arm had received platinum therapy for metastatic disease. Seven percent of patients in each treatment arm had received platinum therapy for localized disease.

The major efficacy outcome measure was PFS assessed by blinded independent central review (BICR) using RECIST version 1.1. A statistically significant improvement in PFS was demonstrated for the Lynparza arm compared to the chemotherapy arm. Efficacy data for OlympiAD are displayed in Table 15 and Figure 4. Consistent results were observed across patient subgroups defined by study stratification factors. An exploratory analysis of investigator-assessed PFS was consistent with the BICR-assessed PFS results.

Table 15 Efficacy Results - OlympiAD (BICR-assessed)

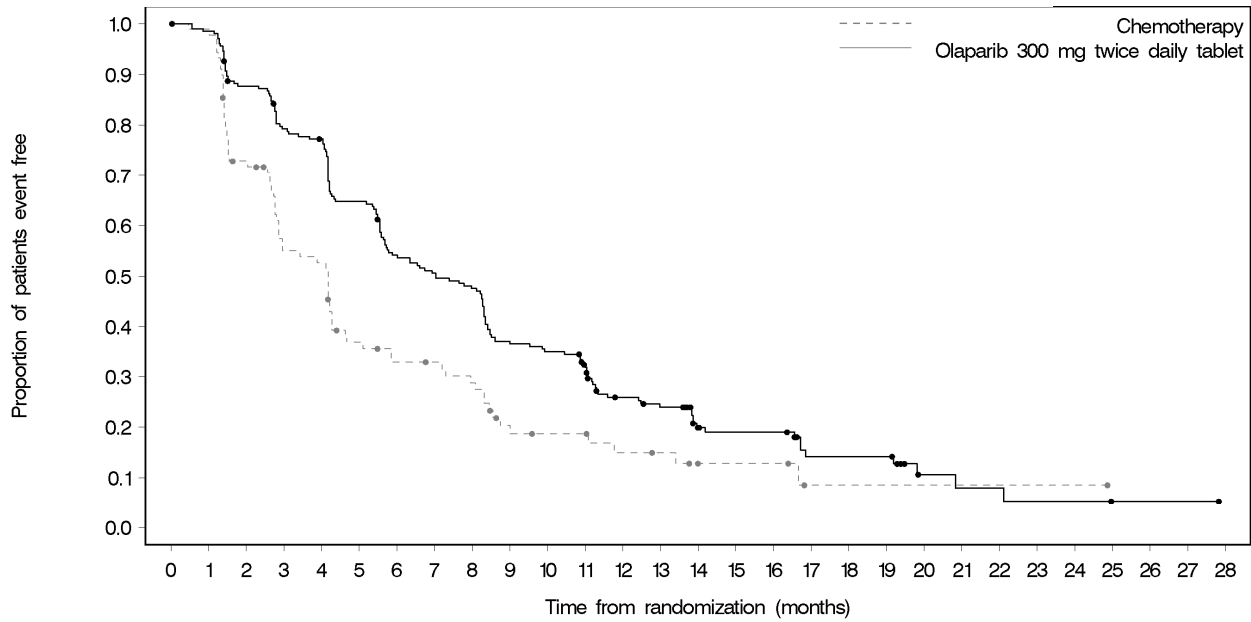
	Lynparza tablets (n=205)	Chemotherapy (n=97)
Progression-Free Survival		
Number of events (%)	163 (80%)	71 (73%)
Median, months	7.0	4.2
Hazard ratio (95% CI) ^a	0.58 (0.43, 0.80)	
p-value ^b	0.0009	
Patients with Measurable Disease	n=167	n=66
Objective Response Rate (95% CI) ^c	52% (44, 60)	23% (13, 35)
Overall Survival		
Number of events (%)	130 (63%)	62 (64%)
Median, months	19.3	17.1
Hazard ratio (95% CI) ^a	0.90 (0.66, 1.23)	

^{a.} Hazard ratio is derived from a stratified log-rank test, stratified by ER, PgR negative versus ER and or PgR positive and prior chemotherapy (yes versus no).

^{b.} For PFS, p-value (2-sided) was compared to 0.05.

^{c.} Response based on confirmed responses. The confirmed complete response rate was 7.8% for Lynparza compared to 1.5% for chemotherapy arm.

Figure 4: Kaplan-Meier Curves of Progression-Free Survival – OlympiAD



Number of patients at risk:

Time (months)	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
Olaparib 300 mg twice daily tablet	205	201	177	159	154	129	107	100	94	73	69	61	40	36	23	21	21	11	11	11	4	3	3	2	2	1	1	1	0
Chemotherapy	97	88	63	46	44	29	25	24	21	13	11	11	8	7	4	4	4	1	1	1	1	1	1	1	1	0	0	0	0

16 HOW SUPPLIED/STORAGE AND HANDLING

16.1 How Supplied

Lynparza is available as 150 mg and 100 mg tablets.

- 150 mg tablets: green to green/grey, oval, bi-convex, film-coated tablet, with debossment ‘OP150’ on one side and plain on the reverse, are available in:
 - Bottles of 60 tablets (NDC 0310-0679-60) and
 - Bottles of 120 tablets (NDC 0310-0679-12).
- 100 mg tablets: yellow to dark yellow, oval, bi-convex, film-coated tablet, with debossment ‘OP100’ on one side and plain on the reverse, are available in:
 - Bottles of 60 tablets (NDC 0310-0668-60) and
 - Bottles of 120 tablets (NDC 0310-0668-12).

16.2 Storage

Store at 20°C to 25°C (68°F to 77°F), excursions permitted to 15°C to 30°C (59°F to 86°F) [see USP Controlled Room Temperature]. Store in original bottle to protect from moisture.

17 PATIENT COUNSELING INFORMATION

Advise the patient to read the FDA-approved patient labeling (Medication Guide).

- **Administration Instructions:** Inform patients that Lynparza should be taken twice daily with or without food. Instruct patients that if they miss a dose of Lynparza, they should take their next normal dose at the usual time. Swallow each tablet whole. Do not chew, crush, dissolve, or divide tablet. Do not take more than 4 tablets daily [see [Dosage and Administration \(2.2\)](#)]. Inform patients to avoid grapefruit, grapefruit juice, Seville oranges, and Seville orange juice while taking Lynparza [see [Drug Interactions \(7.3\)](#)].
- **MDS/AML:** Advise patients to contact their healthcare provider if they experience weakness, feeling tired, fever, weight loss, frequent infections, bruising, bleeding easily, breathlessness, blood in urine or stool, and/or laboratory findings of low blood cell counts, or a need for blood transfusions. This may be a sign of hematological toxicity or a more serious uncommon bone marrow problem called ‘myelodysplastic syndrome’ (MDS) or ‘acute myeloid leukemia’ (AML) which have been reported in patients treated with Lynparza [see [Warnings and Precautions \(5.1\)](#)].
- **Pneumonitis:** Advise patients to contact their healthcare provider if they experience any new or worsening respiratory symptoms including shortness of breath, fever, cough, or wheezing [see [Warnings and Precautions \(5.2\)](#)].
- **Embryo-Fetal Toxicity:** Advise females to inform their healthcare provider if they are pregnant or become pregnant. Inform female patients of the risk to a fetus and potential loss of the pregnancy [see [Use in Specific Populations \(8.1\)](#)]. Advise females of reproductive potential to use effective contraception during treatment with Lynparza and for 6 months after the last dose. Advise male patients with female partners of reproductive potential or who are pregnant to use effective contraception during treatment and for 3 months after receiving the last dose of Lynparza. Advise male patients not to donate sperm during therapy and for 3 months following the last dose of Lynparza [see [Warnings and Precautions \(5.3\)](#) and [Use in Specific Populations \(8.1, 8.3\)](#)].
- **Lactation:** Advise patients not to breastfeed while taking Lynparza and for one month after receiving the last dose [see [Use in Specific Populations \(8.2\)](#)].
- **Nausea/Vomiting:** Advise patients that mild or moderate nausea and/or vomiting is very common in patients receiving Lynparza and that they should contact their healthcare provider who will advise on available antiemetic treatment options.

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Medication Guide
Lynparza® (Lin-par-zah)
(olaparib)
tablets

What is the most important information I should know about Lynparza?

Lynparza may cause serious side effects, including:

Bone marrow problems called Myelodysplastic Syndrome (MDS) or Acute Myeloid Leukemia (AML).

Some people who have ovarian cancer or breast cancer and who have received previous treatment with chemotherapy, radiotherapy or certain other medicines for their cancer have developed MDS or AML during treatment with Lynparza. MDS or AML may lead to death. If you develop MDS or AML, your healthcare provider will stop treatment with Lynparza.

Symptoms of low blood cell counts are common during treatment with Lynparza, but can be a sign of serious bone marrow problems, including MDS or AML. Symptoms may include:

- weakness
- weight loss
- fever
- frequent infections
- blood in urine or stool
- shortness of breath
- feeling very tired
- bruising or bleeding more easily

Your healthcare provider will do blood tests to check your blood cell counts:

- before treatment with Lynparza
- every month during treatment with Lynparza
- weekly if you have low blood cell counts that last a long time. Your healthcare provider may stop treatment with Lynparza until your blood cell counts improve.

Lung problems (pneumonitis). Tell your healthcare provider if you have any new or worsening symptoms of lung problems, including shortness of breath, fever, cough, or wheezing. Your healthcare provider may do a chest x-ray if you have any of these symptoms. Your healthcare provider may temporarily or completely stop treatment if you develop pneumonitis. Pneumonitis may lead to death.

What is Lynparza?

Lynparza is a prescription medicine used to treat adults who have:

- advanced ovarian cancer, fallopian tube cancer, or primary peritoneal cancer with a certain type of inherited (germline) or acquired (somatic) abnormal *BRCA* gene. Lynparza is used as maintenance treatment after the cancer has responded to your first treatment with platinum-based chemotherapy. Your healthcare provider will perform a test to make sure that Lynparza is right for you.
- ovarian cancer, fallopian tube cancer, or primary peritoneal cancer, as maintenance treatment, when the cancer has come back. Lynparza is used after the cancer has responded to treatment with platinum-based chemotherapy.
- advanced ovarian cancer with a certain type of abnormal inherited *BRCA* gene, **and** have received treatment with 3 or more prior types of chemotherapy medicines. Your healthcare provider will perform a test to make sure that Lynparza is right for you.
- a certain type of abnormal inherited *BRCA* gene, human epidermal growth factor receptor 2 (HER2)-negative breast cancer that has spread to other parts of the body (metastatic). You should have received chemotherapy medicines, either before or after your cancer has spread. If you have hormone receptor (HR)-positive disease, you should have been treated with hormonal therapy. Your healthcare provider will perform a test to make sure that Lynparza is right for you.

It is not known if Lynparza is safe and effective in children.

Before taking Lynparza, tell your healthcare provider about all of your medical conditions, including if you:

- have lung or breathing problems
- have kidney problems
- are pregnant, become pregnant, or plan to become pregnant. Lynparza can harm your unborn baby and may cause loss of pregnancy (miscarriage)
 - If you are able to become pregnant, your healthcare provider may do a pregnancy test before you start treatment with Lynparza
 - **Females** who are able to become pregnant should use effective birth control (contraception) during treatment with Lynparza and for 6 months after the last dose of Lynparza. Talk to your healthcare provider about birth control methods that may be right for you. Tell your healthcare provider right away if you become pregnant
 - **Males** with female partners who are pregnant or able to become pregnant should use effective birth control (contraception) during treatment with Lynparza and for 3 months after the last dose of Lynparza
 - Do not donate sperm during treatment with Lynparza and for 3 months after your final dose
- are breastfeeding or plan to breastfeed. It is not known if Lynparza passes into your breast milk. Do not breastfeed during treatment with Lynparza and for 1 month after receiving the last dose of Lynparza. Talk to your healthcare provider about the best way to feed your baby during this time.

Tell your healthcare provider about all the medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements. Taking Lynparza and certain other medicines may affect how Lynparza works and may cause side effects.

How should I take Lynparza?

- Take Lynparza tablets exactly as your healthcare provider tells you.
- Do not change your dose or stop taking Lynparza unless your healthcare provider tells you to. Your healthcare provider may temporarily stop treatment with Lynparza or change your dose of Lynparza if you experience side effects.
- Your healthcare provider will decide how long you stay on treatment.
- **Do not** take more than 4 Lynparza tablets in 1 day. If you have any questions about Lynparza, please talk to your healthcare provider or pharmacist.
- Take Lynparza by mouth 2 times a day.
- Each dose should be taken about 12 hours apart.
- Swallow Lynparza tablets whole. Do not chew, crush, dissolve, or divide the tablets.
- Take Lynparza with or without food.
- If you miss a dose of Lynparza, take your next dose at your usual scheduled time. Do not take an extra dose to make up for a missed dose.
- If you take too much Lynparza, call your healthcare provider or go to the nearest hospital emergency room right away.

What should I avoid while taking Lynparza?

- Avoid grapefruit, grapefruit juice, Seville oranges and Seville orange juice during treatment with Lynparza since they may increase the level of Lynparza in your blood.

What are the possible side effects of Lynparza?

Lynparza may cause serious side effects.

See “What is the most important information I should know about Lynparza?”

The most common side effects of Lynparza are:

- nausea or vomiting. Tell your healthcare provider if you get nausea or vomiting. Your healthcare provider may prescribe medicines to treat these symptoms.

- low number of red or white blood cells
- stomach-area (abdominal) pain
- dizziness
- tiredness or weakness
- sore throat or runny nose
- diarrhea
- joint, muscle, and back pain
- headache
- constipation
- mouth sores
- respiratory tract infections
- changes in kidney function blood test
- changes in the way food tastes
- loss of appetite
- low number of platelets
- indigestion or heartburn

These are not all of the possible side effects of Lynparza.

Call your healthcare provider for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

How should I store Lynparza?

- Store Lynparza at room temperature, between 68°F to 77°F (20°C to 25°C).
- Store Lynparza in the original bottle to protect it from moisture.

Keep Lynparza and all medicines out of the reach of children.

General information about the safe and effective use of Lynparza

Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. Do not use Lynparza for a condition for which it was not prescribed. Do not give Lynparza to other people, even if they have the same symptoms you have. It may **harm** them.

You can ask your healthcare provider or pharmacist for information about Lynparza that is written for health professionals.

What are the ingredients in Lynparza?

Active ingredient: olaparib

Inactive ingredients:

Tablet contains: copovidone, mannitol, colloidal silicon dioxide and sodium stearyl fumarate

Tablet coating contains: hypromellose, polyethylene glycol 400, titanium dioxide, ferric oxide yellow and ferrousferrous oxide (150 mg tablet only)

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For more information, call 1-800-236-9933 or go to www.Lynparza.com.

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