

**HIGHLIGHTS OF PRESCRIBING INFORMATION**

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

ZYTIGA® (abiraterone acetate) tablets  
for oral use  
Initial U.S. Approval: 2011

**RECENT MAJOR CHANGES**

Indications and Usage (1)	02/2018
Dosage and Administration (2)	02/2018
Warnings and Precautions (5)	02/2018

**INDICATIONS AND USAGE**

ZYTIGA is a CYP17 inhibitor indicated in combination with prednisone for the treatment of patients with

- metastatic castration-resistant prostate cancer (CRPC). (1)
- metastatic high-risk castration-sensitive prostate cancer (CSPC). (1)

**DOSAGE AND ADMINISTRATION**

Metastatic castration-resistant prostate cancer:

- ZYTIGA 1,000 mg orally once daily with prednisone 5 mg orally **twice** daily. (2.1)

Metastatic castration-sensitive prostate cancer:

- ZYTIGA 1,000 mg orally once daily with prednisone 5 mg orally **once** daily. (2.2)

Patients receiving ZYTIGA should also receive a gonadotropin-releasing hormone (GnRH) analog concurrently or should have had bilateral orchiectomy. ZYTIGA must be taken on an empty stomach with water at least 1 hour before or 2 hours after a meal. Do not crush or chew tablets. (2.3)

Dose Modification:

- For patients with baseline moderate hepatic impairment (Child-Pugh Class B), reduce the ZYTIGA starting dose to 250 mg once daily. (2.4)
- For patients who develop hepatotoxicity during treatment, hold ZYTIGA until recovery. Retreatment may be initiated at a reduced dose. ZYTIGA should be discontinued if patients develop severe hepatotoxicity. (2.4)

**DOSAGE FORMS AND STRENGTHS**

- Film-Coated Tablet 500 mg (3)
- Film-Coated Tablet 250 mg (3)
- Uncoated Tablet 250 mg (3)

**CONTRAINDICATIONS**

- Pregnancy. (4, 8.1)

**WARNINGS AND PRECAUTIONS**

- Mineralocorticoid excess: Closely monitor patients with cardiovascular disease. Control hypertension and correct hypokalemia before treatment. Monitor blood pressure, serum potassium and symptoms of fluid retention at least monthly. (5.1)
- Adrenocortical insufficiency: Monitor for symptoms and signs of adrenocortical insufficiency. Increased dosage of corticosteroids may be indicated before, during and after stressful situations. (5.2)
- Hepatotoxicity: Can be severe and fatal. Monitor liver function and modify, interrupt, or discontinue ZYTIGA dosing as recommended. (5.3)

**ADVERSE REACTIONS**

The most common adverse reactions (≥10%) are fatigue, arthralgia, hypertension, nausea, edema, hypokalemia, hot flush, diarrhea, vomiting, upper respiratory infection, cough, and headache. (6.1)

The most common laboratory abnormalities (>20%) are anemia, elevated alkaline phosphatase, hypertriglyceridemia, lymphopenia, hypercholesterolemia, hyperglycemia, and hypokalemia. (6.1)

To report SUSPECTED ADVERSE REACTIONS, contact Janssen Biotech, Inc. at 1-800-526-7736 (1-800-JANSSEN) or FDA at 1-800-FDA-1088 or [www.fda.gov/medwatch](http://www.fda.gov/medwatch).

**DRUG INTERACTIONS**

- CYP3A4 Inducers: Avoid concomitant strong CYP3A4 inducers during ZYTIGA treatment. If a strong CYP3A4 inducer must be co-administered, increase the ZYTIGA dosing frequency. (2.5, 7.1)
- CYP2D6 Substrates: Avoid co-administration of ZYTIGA with CYP2D6 substrates that have a narrow therapeutic index. If an alternative treatment cannot be used, exercise caution and consider a dose reduction of the concomitant CYP2D6 substrate. (7.2)

**USE IN SPECIFIC POPULATIONS**

- Females and Males of Reproductive Potential: Advise males with female partners of reproductive potential to use effective contraception. (8.3)
- Do not use ZYTIGA in patients with baseline severe hepatic impairment (Child-Pugh Class C). (8.6)

See 17 for PATIENT COUNSELING INFORMATION and FDA-approved patient labeling.

Revised: 02/2018

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## FULL PRESCRIBING INFORMATION

### 1 INDICATIONS AND USAGE

ZYTIGA is indicated in combination with prednisone for the treatment of patients with

- Metastatic castration-resistant prostate cancer (CRPC)
- Metastatic high-risk castration-sensitive prostate cancer (CSPC)

### 2 DOSAGE AND ADMINISTRATION

#### 2.1 Recommended Dose for metastatic CRPC

The recommended dose of ZYTIGA is 1,000 mg (two 500 mg tablets or four 250 mg tablets) orally once daily with prednisone 5 mg orally **twice** daily.

#### 2.2 Recommended Dose for metastatic high-risk CSPC

The recommended dose of ZYTIGA is 1,000 mg (two 500 mg tablets or four 250 mg tablets) orally once daily with prednisone 5 mg administered orally **once** daily.

#### 2.3 Important Administration Instructions

Patients receiving ZYTIGA should also receive a gonadotropin-releasing hormone (GnRH) analog concurrently or should have had bilateral orchiectomy. ZYTIGA must be taken on an empty stomach, either one hour before or two hours after a meal [*see Clinical Pharmacology (12.3)*]. The tablets should be swallowed whole with water. Do not crush or chew tablets.

#### 2.4 Dose Modification Guidelines in Hepatic Impairment and Hepatotoxicity

##### Hepatic Impairment

In patients with baseline moderate hepatic impairment (Child-Pugh Class B), reduce the recommended dose of ZYTIGA to 250 mg once daily. In patients with moderate hepatic impairment monitor ALT, AST, and bilirubin prior to the start of treatment, every week for the first month, every two weeks for the following two months of treatment and monthly thereafter. If elevations in ALT and/or AST greater than 5X upper limit of normal (ULN) or total bilirubin greater than 3X ULN occur in patients with baseline moderate hepatic impairment, discontinue ZYTIGA and do not re-treat patients with ZYTIGA [*see Use in Specific Populations (8.6)* and *Clinical Pharmacology (12.3)*].

Do not use ZYTIGA in patients with baseline severe hepatic impairment (Child-Pugh Class C).

##### Hepatotoxicity

For patients who develop hepatotoxicity during treatment with ZYTIGA (ALT and/or AST greater than 5X ULN or total bilirubin greater than 3X ULN), interrupt treatment with ZYTIGA [*see Warnings and Precautions (5.3)*]. Treatment may be restarted at a reduced dose of 750 mg once daily following return of liver function tests to the patient's baseline or to AST and ALT

less than or equal to 2.5X ULN and total bilirubin less than or equal to 1.5X ULN. For patients who resume treatment, monitor serum transaminases and bilirubin at a minimum of every two weeks for three months and monthly thereafter.

If hepatotoxicity recurs at the dose of 750 mg once daily, re-treatment may be restarted at a reduced dose of 500 mg once daily following return of liver function tests to the patient's baseline or to AST and ALT less than or equal to 2.5X ULN and total bilirubin less than or equal to 1.5X ULN.

If hepatotoxicity recurs at the reduced dose of 500 mg once daily, discontinue treatment with ZYTIGA.

Permanently discontinue ZYTIGA for patients who develop a concurrent elevation of ALT greater than 3 x ULN and total bilirubin greater than 2 x ULN in the absence of biliary obstruction or other causes responsible for the concurrent elevation [see *Warnings and Precautions (5.3)*].

## 2.5 Dose Modification Guidelines for Strong CYP3A4 Inducers

Avoid concomitant strong CYP3A4 inducers (e.g., phenytoin, carbamazepine, rifampin, rifabutin, rifapentine, phenobarbital) during ZYTIGA treatment.

If a strong CYP3A4 inducer must be co-administered, increase the ZYTIGA dosing frequency to twice a day only during the co-administration period (e.g., from 1,000 mg once daily to 1,000 mg twice a day). Reduce the dose back to the previous dose and frequency, if the concomitant strong CYP3A4 inducer is discontinued [see *Drug Interactions (7.1)* and *Clinical Pharmacology (12.3)*].

## 3 DOSAGE FORMS AND STRENGTHS

Tablets (500 mg): purple, oval-shaped, film-coated tablets debossed with "AA" one side and "500" on the other side.

Tablets (250 mg): pink, oval-shaped, film-coated tablets debossed with "AA250" on one side.

Tablets (250 mg): white to off-white, oval-shaped tablets debossed with "AA250" on one side.

## 4 CONTRAINDICATIONS

### Pregnancy

ZYTIGA can cause fetal harm and potential loss of pregnancy [see *Use in Specific Populations (8.1)*].

## **5 WARNINGS AND PRECAUTIONS**

### **5.1 Hypertension, Hypokalemia and Fluid Retention Due to Mineralocorticoid Excess**

ZYTIGA may cause hypertension, hypokalemia, and fluid retention as a consequence of increased mineralocorticoid levels resulting from CYP17 inhibition [*see Clinical Pharmacology (12.1)*]. Monitor patients for hypertension, hypokalemia, and fluid retention at least once a month. Control hypertension and correct hypokalemia before and during treatment with ZYTIGA.

In the combined data from 4 placebo-controlled trials using prednisone 5 mg twice daily in combination with 1000 mg abiraterone acetate daily, grades 3-4 hypokalemia were detected in 4% of patients on the ZYTIGA arm and 2% of patients on the placebo arm. Grades 3-4 hypertension were observed in 2% of patients each arm and grades 3-4 fluid retention in 1% of patients each arm.

In LATITUDE (a randomized placebo-controlled, multicenter clinical trial), which used prednisone 5 mg daily in combination with 1000 mg abiraterone acetate daily, grades 3-4 hypokalemia were detected in 10% of patients on the ZYTIGA arm and 1% of patients on the placebo arm, grades 3-4 hypertension were observed in 20% of patients on the ZYTIGA arm and 10% of patients on the placebo arm. Grades 3-4 fluid retention occurred in 1% of patients each arm [*see Adverse Reactions (6)*].

Closely monitor patients whose underlying medical conditions might be compromised by increases in blood pressure, hypokalemia or fluid retention, such as those with heart failure, recent myocardial infarction, cardiovascular disease, or ventricular arrhythmia. The safety of ZYTIGA in patients with left ventricular ejection fraction <50% or New York Heart Association (NYHA) Class III or IV heart failure (in COU-AA-301) or NYHA Class II to IV heart failure (in COU-AA-302 and LATITUDE) has not been established because these patients were excluded from these randomized clinical trials [*see Clinical Studies (14)*].

### **5.2 Adrenocortical Insufficiency**

Adrenal insufficiency occurred in 0.3% of 2230 patients taking ZYTIGA and in 0.1% of 1763 patients taking placebo in the combined data of the 5 randomized, placebo-controlled clinical studies. Adrenocortical insufficiency was reported in patients receiving ZYTIGA in combination with prednisone, following interruption of daily steroids and/or with concurrent infection or stress.

Monitor patients for symptoms and signs of adrenocortical insufficiency, particularly if patients are withdrawn from prednisone, have prednisone dose reductions, or experience unusual stress.

Symptoms and signs of adrenocortical insufficiency may be masked by adverse reactions associated with mineralocorticoid excess seen in patients treated with ZYTIGA. If clinically indicated, perform appropriate tests to confirm the diagnosis of adrenocortical insufficiency. Increased dosage of corticosteroids may be indicated before, during and after stressful situations [see *Warnings and Precautions (5.1)*].

### **5.3 Hepatotoxicity**

In postmarketing experience, there have been ZYTIGA-associated severe hepatic toxicity, including fulminant hepatitis, acute liver failure and deaths [see *Adverse Reactions (6.2)*].

In the combined data of 5 randomized clinical trials, grade 3-4 ALT or AST increases (at least 5X ULN) were reported in 6% of 2230 patients who received ZYTIGA, typically during the first 3 months after starting treatment. Patients whose baseline ALT or AST were elevated were more likely to experience liver test elevation than those beginning with normal values. Treatment discontinuation due to ALT and AST increases or abnormal hepatic function occurred in 1.1% of 2230 patients taking ZYTIGA. In these clinical trials, no deaths clearly related to ZYTIGA were reported due to hepatotoxicity events.

Measure serum transaminases (ALT and AST) and bilirubin levels prior to starting treatment with ZYTIGA, every two weeks for the first three months of treatment and monthly thereafter. In patients with baseline moderate hepatic impairment receiving a reduced ZYTIGA dose of 250 mg, measure ALT, AST, and bilirubin prior to the start of treatment, every week for the first month, every two weeks for the following two months of treatment and monthly thereafter. Promptly measure serum total bilirubin, AST, and ALT if clinical symptoms or signs suggestive of hepatotoxicity develop. Elevations of AST, ALT, or bilirubin from the patient's baseline should prompt more frequent monitoring. If at any time AST or ALT rise above five times the ULN, or the bilirubin rises above three times the ULN, interrupt ZYTIGA treatment and closely monitor liver function.

Re-treatment with ZYTIGA at a reduced dose level may take place only after return of liver function tests to the patient's baseline or to AST and ALT less than or equal to 2.5X ULN and total bilirubin less than or equal to 1.5X ULN [see *Dosage and Administration (2.4)*].

Permanently discontinue ZYTIGA for patients who develop a concurrent elevation of ALT greater than 3 x ULN and total bilirubin greater than 2 x ULN in the absence of biliary obstruction or other causes responsible for the concurrent elevation [see *Dosage and Administration (2.4)*].

The safety of ZYTIGA re-treatment of patients who develop AST or ALT greater than or equal to 20X ULN and/or bilirubin greater than or equal to 10X ULN is unknown.

## 6 ADVERSE REACTIONS

The following are discussed in more detail in other sections of the labeling:

- Hypertension, Hypokalemia, and Fluid Retention due to Mineralocorticoid Excess [*see Warnings and Precautions (5.1)*].
- Adrenocortical Insufficiency [*see Warnings and Precautions (5.2)*].
- Hepatotoxicity [*see Warnings and Precautions (5.3)*].

### 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 clinical practice.

Two randomized placebo-controlled, multicenter clinical trials (COU-AA-301 and COU-AA-302) enrolled patients who had metastatic CRPC in which ZYTIGA was administered orally at a dose of 1,000 mg daily in combination with prednisone 5 mg twice daily in the active treatment arms. Placebo plus prednisone 5 mg twice daily was given to patients on the control arm. A third randomized placebo-controlled, multicenter clinical trial (LATITUDE) enrolled patients who had metastatic high-risk CSPC in which ZYTIGA was administered at a dose of 1,000 mg daily in combination with prednisone 5 mg once daily. Placebos were administered to patients in the control arm. Additionally, two other randomized, placebo-controlled trials were conducted in patients with metastatic CRPC. The safety data pooled from 2230 patients in the 5 randomized controlled trials constitute the basis for the data presented in the Warnings and Precautions, Grade 1-4 adverse reactions, and Grade 1-4 laboratory abnormalities. In all trials, a gonadotropin-releasing hormone (GnRH) analog or prior orchiectomy was required in both arms.

In the pooled data, median treatment duration was 11 months (0.1, 43) for ZYTIGA-treated patients and 7.2 months (0.1, 43) for placebo-treated patients. The most common adverse reactions ( $\geq 10\%$ ) that occurred more commonly ( $>2\%$ ) in the ZYTIGA arm were fatigue, arthralgia, hypertension, nausea, edema, hypokalemia, hot flush, diarrhea, vomiting, upper respiratory infection, cough, and headache. The most common laboratory abnormalities ( $>20\%$ ) that occurred more commonly ( $\geq 2\%$ ) in the ZYTIGA arm were anemia, elevated alkaline phosphatase, hypertriglyceridemia, lymphopenia, hypercholesterolemia, hyperglycemia, and hypokalemia. Grades 3-4 adverse events were reported for 53% of patients in the ZYTIGA arm and 46% of patients in the placebo arm. Treatment discontinuation was reported in 14% of patients in the ZYTIGA arm and 13% of patients in the placebo arm. The common adverse

events ( $\geq 1\%$ ) resulting in discontinuation of ZYTIGA and prednisone were hepatotoxicity and cardiac disorders.

Deaths associated with treatment-emergent adverse events were reported for 7.5% of patients in the ZYTIGA arm and 6.6% of patients in the placebo arm. Of the patients in the ZYTIGA arm, the most common cause of death was disease progression (3.3%). Other reported causes of death in  $\geq 5$  patients included pneumonia, cardio-respiratory arrest, death (no additional information), and general physical health deterioration.

### **COU-AA-301: Metastatic CRPC Following Chemotherapy**

COU-AA-301 enrolled 1195 patients with metastatic CRPC who had received prior docetaxel chemotherapy. Patients were not eligible if AST and/or ALT  $\geq 2.5X$  ULN in the absence of liver metastases. Patients with liver metastases were excluded if AST and/or ALT  $> 5X$  ULN.

Table 1 shows adverse reactions on the ZYTIGA arm in COU-AA-301 that occurred with a  $\geq 2\%$  absolute increase in frequency compared to placebo or were events of special interest. The median duration of treatment with ZYTIGA with prednisone was 8 months.

**Table 1: Adverse Reactions due to ZYTIGA in COU-AA-301**

System/Organ Class Adverse reaction	ZYTIGA with Prednisone (N=791)		Placebo with Prednisone (N=394)	
	All Grades <sup>1</sup> %	Grade 3-4 %	All Grades %	Grade 3-4 %
<b>Musculoskeletal and connective tissue disorders</b>				
Joint swelling/discomfort <sup>2</sup>	30	4.2	23	4.1

Muscle discomfort <sup>3</sup>	26	3.0	23	2.3
<b>General disorders</b>				
Edema <sup>4</sup>	27	1.9	18	0.8
<b>Vascular disorders</b>				
Hot flush	19	0.3	17	0.3
Hypertension	8.5	1.3	6.9	0.3
<b>Gastrointestinal disorders</b>				
Diarrhea	18	0.6	14	1.3
Dyspepsia	6.1	0	3.3	0
<b>Infections and infestations</b>				
Urinary tract infection	12	2.1	7.1	0.5
Upper respiratory tract infection	5.4	0	2.5	0
<b>Respiratory, thoracic and mediastinal disorders</b>				
Cough	11	0	7.6	0
<b>Renal and urinary disorders</b>				
Urinary frequency	7.2	0.3	5.1	0.3
Nocturia	6.2	0	4.1	0
<b>Injury, poisoning and procedural complications</b>				
Fractures <sup>5</sup>	5.9	1.4	2.3	0
<b>Cardiac disorders</b>				
Arrhythmia <sup>6</sup>	7.2	1.1	4.6	1.0
Chest pain or chest discomfort <sup>7</sup>	3.8	0.5	2.8	0
Cardiac failure <sup>8</sup>	2.3	1.9	1.0	0.3

<sup>1</sup> Adverse events graded according to CTCAE version 3.0.

<sup>2</sup> Includes terms Arthritis, Arthralgia, Joint swelling, and Joint stiffness.

<sup>3</sup> Includes terms Muscle spasms, Musculoskeletal pain, Myalgia, Musculoskeletal discomfort, and Musculoskeletal stiffness.

<sup>4</sup> Includes terms Edema, Edema peripheral, Pitting edema, and Generalized edema.

<sup>5</sup> Includes all fractures with the exception of pathological fracture.

<sup>6</sup> Includes terms Arrhythmia, Tachycardia, Atrial fibrillation, Supraventricular tachycardia, Atrial tachycardia, Ventricular tachycardia, Atrial flutter, Bradycardia, Atrioventricular block complete, Conduction disorder, and Bradyarrhythmia.

<sup>7</sup> Includes terms Angina pectoris, Chest pain, and Angina unstable. Myocardial infarction or ischemia occurred more commonly in the placebo arm than in the ZYTIGA arm (1.3% vs. 1.1% respectively).

<sup>8</sup> Includes terms Cardiac failure, Cardiac failure congestive, Left ventricular dysfunction, Cardiogenic shock, Cardiomegaly, Cardiomyopathy, and Ejection fraction decreased.

Table 2 shows laboratory abnormalities of interest from COU-AA-301.

**Table 2: Laboratory Abnormalities of Interest in COU-AA-301**

Laboratory Abnormality	ZYTIGA with Prednisone (N=791)		Placebo with Prednisone (N=394)	
	All Grades (%)	Grade 3-4 (%)	All Grades (%)	Grade 3-4 (%)
Hypertriglyceridemia	63	0.4	53	0
High AST	31	2.1	36	1.5
Hypokalemia	28	5.3	20	1.0
Hypophosphatemia	24	7.2	16	5.8
High ALT	11	1.4	10	0.8
High Total Bilirubin	6.6	0.1	4.6	0



### **COU-AA-302: Metastatic CRPC Prior to Chemotherapy**

COU-AA-302 enrolled 1088 patients with metastatic CRPC who had not received prior cytotoxic chemotherapy. Patients were ineligible if AST and/or ALT  $\geq 2.5X$  ULN and patients were excluded if they had liver metastases.

Table 3 shows adverse reactions on the ZYTIGA arm in COU-AA-302 that occurred in  $\geq 5\%$  of patients with a  $\geq 2\%$  absolute increase in frequency compared to placebo. The median duration of treatment with ZYTIGA with prednisone was 13.8 months.

**Table 3: Adverse Reactions in  $\geq 5\%$  of Patients on the ZYTIGA Arm in COU-AA-302**

System/Organ Class Adverse reaction	ZYTIGA with Prednisone (N=542)		Placebo with Prednisone (N=540)	
	All Grades <sup>1</sup> %	Grade 3-4 %	All Grades %	Grade 3-4 %
<b>General disorders</b>				
Fatigue	39	2.2	34	1.7
Edema <sup>2</sup>	25	0.4	21	1.1
Pyrexia	8.7	0.6	5.9	0.2
<b>Musculoskeletal and connective tissue disorders</b>				
Joint swelling/discomfort <sup>3</sup>	30	2.0	25	2.0
Groin pain	6.6	0.4	4.1	0.7
<b>Gastrointestinal disorders</b>				
Constipation	23	0.4	19	0.6
Diarrhea	22	0.9	18	0.9
Dyspepsia	11	0.0	5.0	0.2
<b>Vascular disorders</b>				
Hot flush	22	0.2	18	0.0
Hypertension	22	3.9	13	3.0
<b>Respiratory, thoracic and mediastinal disorders</b>				
Cough	17	0.0	14	0.2
Dyspnea	12	2.4	9.6	0.9
<b>Psychiatric disorders</b>				
Insomnia	14	0.2	11	0.0
<b>Injury, poisoning and procedural complications</b>				
Contusion	13	0.0	9.1	0.0
Falls	5.9	0.0	3.3	0.0
<b>Infections and infestations</b>				
Upper respiratory tract infection	13	0.0	8.0	0.0
Nasopharyngitis	11	0.0	8.1	0.0
<b>Renal and urinary disorders</b>				
Hematuria	10	1.3	5.6	0.6
<b>Skin and subcutaneous tissue disorders</b>				
Rash	8.1	0.0	3.7	0.0

<sup>1</sup> Adverse events graded according to CTCAE version 3.0.

<sup>2</sup> Includes terms Edema peripheral, Pitting edema, and Generalized edema.

<sup>3</sup> Includes terms Arthritis, Arthralgia, Joint swelling, and Joint stiffness.

Table 4 shows laboratory abnormalities that occurred in greater than 15% of patients, and more frequently ( $>5\%$ ) in the ZYTIGA arm compared to placebo in COU-AA-302.

**Table 4: Laboratory Abnormalities in >15% of Patients in the ZYTIGA Arm of COU-AA-302**

Laboratory Abnormality	ZYTIGA with Prednisone (N=542)		Placebo with Prednisone (N=540)	
	Grade 1-4 %	Grade 3-4 %	Grade 1-4 %	Grade 3-4 %
Hematology				
Lymphopenia	38	8.7	32	7.4
Chemistry				
Hyperglycemia <sup>1</sup>	57	6.5	51	5.2
High ALT	42	6.1	29	0.7
High AST	37	3.1	29	1.1
Hypnatremia	33	0.4	25	0.2
Hypokalemia	17	2.8	10	1.7

<sup>1</sup> Based on non-fasting blood draws

### **LATITUDE: Patients with Metastatic High-risk CSPC**

LATITUDE enrolled 1199 patients with newly-diagnosed metastatic, high-risk CSPC who had not received prior cytotoxic chemotherapy. Patients were ineligible if AST and/or ALT  $\geq 2.5X$  ULN or if they had liver metastases. All the patients received GnRH analogs or had prior bilateral orchiectomy during the trial. The median duration of treatment with ZYTIGA and prednisone was 24 months.

Table 5 shows adverse reactions on the ZYTIGA arm that occurred in  $\geq 5\%$  of patients with a  $\geq 2\%$  absolute increase in frequency compared to those on the placebos arm.

**Table 5: Adverse Reactions in ≥5% of Patients on the ZYTIGA Arm in LATITUDE<sup>1</sup>**

System/Organ Class Adverse reaction	ZYTIGA with Prednisone (N=597)		Placebos (N=602)	
	All Grades <sup>2</sup> %	Grade 3-4 %	All Grades %	Grade 3-4 %
<b>Vascular disorders</b>				
Hypertension	37	20	13	10
Hot flush	15	0.0	13	0.2
<b>Metabolism and nutrition disorders</b>				
Hypokalemia	20	10	3.7	1.3
<b>Investigations</b>				
Alanine aminotransferase increased <sup>3</sup>	16	5.5	13	1.3
Aspartate aminotransferase increased <sup>3</sup>	15	4.4	11	1.5
<b>Infections and infestations</b>				
Urinary tract infection	7.0	1.0	3.7	0.8
Upper respiratory tract infection	6.7	0.2	4.7	0.2
<b>Nervous system disorders</b>				
Headache	7.5	0.3	5.0	0.2
<b>Respiratory, Thoracic and Mediastinal Disorders</b>				
Cough <sup>4</sup>	6.5	0.0	3.2	0

<sup>1</sup> All patients were receiving an GnRH agonist or had undergone orchiectomy.

<sup>2</sup> Adverse events graded according to CTCAE version 4.0

<sup>3</sup> Reported as an adverse event or reaction

<sup>4</sup> Including cough, productive cough, upper airway cough syndrome

Table 6 shows laboratory abnormalities that occurred in >15% of patients, and more frequently (>5%) in the ZYTIGA arm compared to placebos.

**Table 6: Laboratory Abnormalities in >15% of Patients in the ZYTIGA Arm of LATITUDE**

Laboratory Abnormality	ZYTIGA with Prednisone (N=597)		Placebos (N=602)	
	Grade 1-4 %	Grade 3-4 %	Grade 1-4 %	Grade 3-4 %
<b>Hematology</b>				
Lymphopenia	20	4.1	14	1.8
<b>Chemistry</b>				
Hypokalemia	30	9.6	6.7	1.3
Elevated ALT	46	6.4	45	1.3
Elevated total bilirubin	16	0.2	6.2	0.2

### Cardiovascular Adverse Reactions

In the combined data of 5 randomized, placebo-controlled clinical studies, cardiac failure occurred more commonly in patients on the ZYTIGA arm compared to patients on the placebo arm (2.6% versus 0.9%). Grade 3-4 cardiac failure occurred in 1.3% of patients taking ZYTIGA and led to 5 treatment discontinuations and 4 deaths. Grade 3-4 cardiac failure occurred in 0.2%

of patients taking placebo. There were no treatment discontinuations and two deaths due to cardiac failure in the placebo group.

In the same combined data, the majority of arrhythmias were grade 1 or 2. There was one death associated with arrhythmia and three patients with sudden death in the ZYTIGA arms and five deaths in the placebo arms. There were 7 (0.3%) deaths due to cardiorespiratory arrest in the ZYTIGA arms and 2 (0.1%) deaths in the placebo arms. Myocardial ischemia or myocardial infarction led to death in 3 patients in the placebo arms and 3 deaths in the ZYTIGA arms.

## 6.2 Postmarketing Experience

The following additional adverse reactions have been identified during post approval use of ZYTIGA with prednisone. 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.

*Respiratory, Thoracic and Mediastinal Disorders:* non-infectious pneumonitis.

*Musculoskeletal and Connective Tissue Disorders:* myopathy, including rhabdomyolysis.

*Hepatobiliary Disorders:* fulminant hepatitis, including acute hepatic failure and death.

## 7 DRUG INTERACTIONS

### 7.1 Drugs that Inhibit or Induce CYP3A4 Enzymes

Based on *in vitro* data, ZYTIGA is a substrate of CYP3A4.

In a dedicated drug interaction trial, co-administration of rifampin, a strong CYP3A4 inducer, decreased exposure of abiraterone by 55%. Avoid concomitant strong CYP3A4 inducers during ZYTIGA treatment. If a strong CYP3A4 inducer must be co-administered, increase the ZYTIGA dosing frequency [*see Dosage and Administration (2.5) and Clinical Pharmacology (12.3)*].

In a dedicated drug interaction trial, co-administration of ketoconazole, a strong inhibitor of CYP3A4, had no clinically meaningful effect on the pharmacokinetics of abiraterone [*see Clinical Pharmacology (12.3)*].

### 7.2 Effects of Abiraterone on Drug Metabolizing Enzymes

ZYTIGA is an inhibitor of the hepatic drug-metabolizing enzymes CYP2D6 and CYP2C8. In a CYP2D6 drug-drug interaction trial, the  $C_{max}$  and AUC of dextromethorphan (CYP2D6 substrate) were increased 2.8- and 2.9-fold, respectively, when dextromethorphan was given with abiraterone acetate 1,000 mg daily and prednisone 5 mg twice daily. Avoid co-administration of abiraterone acetate with substrates of CYP2D6 with a narrow therapeutic index (e.g.,

thioridazine). If alternative treatments cannot be used, consider a dose reduction of the concomitant CYP2D6 substrate drug [see *Clinical Pharmacology (12.3)*].

In a CYP2C8 drug-drug interaction trial in healthy subjects, the AUC of pioglitazone (CYP2C8 substrate) was increased by 46% when pioglitazone was given together with a single dose of 1,000 mg abiraterone acetate. Therefore, patients should be monitored closely for signs of toxicity related to a CYP2C8 substrate with a narrow therapeutic index if used concomitantly with ZYTIGA [see *Clinical Pharmacology (12.3)*].

## **8 USE IN SPECIFIC POPULATIONS**

### **8.1 Pregnancy**

#### Risk Summary

Based on findings from animal studies and the mechanism of action, ZYTIGA is contraindicated for use in pregnant women because the drug can cause fetal harm and potential loss of pregnancy. ZYTIGA is not indicated for use in females.

There are no human data on the use of ZYTIGA in pregnant women. In animal reproduction studies, oral administration of abiraterone acetate to pregnant rats during organogenesis caused adverse developmental effects at maternal exposures approximately  $\geq 0.03$  times the human exposure (AUC) at the recommended dose (*see Data*).

#### Data

##### *Animal Data*

In an embryo-fetal developmental toxicity study in rats, abiraterone acetate caused developmental toxicity when administered at oral doses of 10, 30 or 100 mg/kg/day throughout the period of organogenesis (gestational days 6-17). Findings included embryo-fetal lethality (increased post implantation loss and resorptions and decreased number of live fetuses), fetal developmental delay (skeletal effects) and urogenital effects (bilateral ureter dilation) at doses  $\geq 10$  mg/kg/day, decreased fetal ano-genital distance at  $\geq 30$  mg/kg/day, and decreased fetal body weight at 100 mg/kg/day. Doses  $\geq 10$  mg/kg/day caused maternal toxicity. The doses tested in rats resulted in systemic exposures (AUC) approximately 0.03, 0.1 and 0.3 times, respectively, the AUC in patients.

### **8.2 Lactation**

#### Risk Summary

ZYTIGA is not indicated for use in women. There is no information available on the presence of abiraterone acetate in human milk, or on the effects on the breastfed child or milk production.

### **8.3 Females and Males of Reproductive Potential**

#### Contraception

##### *Males*

Based on findings in animal reproduction studies and its mechanism of action, advise males with female partners of reproductive potential to use effective contraception during treatment and for 3 weeks after the final dose of ZYTIGA [see *Use in Specific Populations (8.1)*].

#### Infertility

Based on animal studies, ZYTIGA may impair reproductive function and fertility in males of reproductive potential [see *Nonclinical Toxicology (13.1)*].

### **8.4 Pediatric Use**

Safety and effectiveness of ZYTIGA in pediatric patients have not been established.

### **8.5 Geriatric Use**

Of the total number of patients receiving ZYTIGA in randomized clinical trials, 70% of patients were 65 years and over and 27% were 75 years and over. No overall differences in safety or effectiveness were observed between these elderly patients and younger patients. Other reported clinical experience has not identified differences in responses between the elderly and younger patients, but greater sensitivity of some older individuals cannot be ruled out.

### **8.6 Patients with Hepatic Impairment**

The pharmacokinetics of abiraterone were examined in subjects with baseline mild (N=8) or moderate (N=8) hepatic impairment (Child-Pugh Class A and B, respectively) and in 8 healthy control subjects with normal hepatic function. The systemic exposure (AUC) of abiraterone after a single oral 1,000 mg dose of ZYTIGA increased by approximately 1.1-fold and 3.6-fold in subjects with mild and moderate baseline hepatic impairment, respectively compared to subjects with normal hepatic function.

In another trial, the pharmacokinetics of abiraterone were examined in subjects with baseline severe (N=8) hepatic impairment (Child-Pugh Class C) and in 8 healthy control subjects with normal hepatic function. The systemic exposure (AUC) of abiraterone increased by approximately 7-fold and the fraction of free drug increased 2-fold in subjects with severe baseline hepatic impairment compared to subjects with normal hepatic function.

No dosage adjustment is necessary for patients with baseline mild hepatic impairment. In patients with baseline moderate hepatic impairment (Child-Pugh Class B), reduce the recommended dose of ZYTIGA to 250 mg once daily. Do not use ZYTIGA in patients with baseline severe hepatic impairment (Child-Pugh Class C). If elevations in ALT or AST >5X

ULN or total bilirubin >3X ULN occur in patients with baseline moderate hepatic impairment, discontinue ZYTIGA treatment [see *Dosage and Administration* (2.4) and *Clinical Pharmacology* (12.3)].

For patients who develop hepatotoxicity during treatment, interruption of treatment and dosage adjustment may be required [see *Dosage and Administration* (2.4), *Warnings and Precautions* (5.3), and *Clinical Pharmacology* (12.3)].

### 8.7 Patients with Renal Impairment

No dosage adjustment is necessary for patients with renal impairment [see *Clinical Pharmacology* (12.3)].

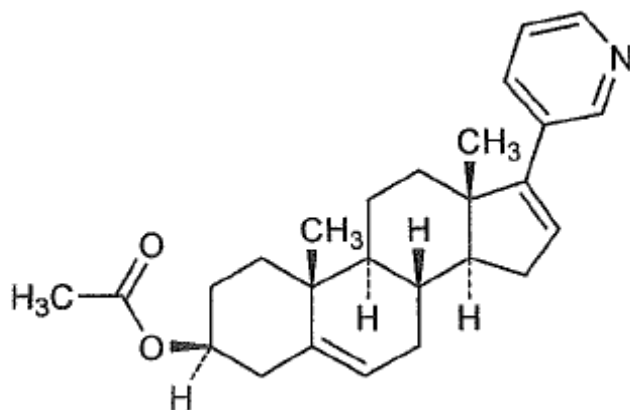
## 10 OVERDOSAGE

Human experience of overdose with ZYTIGA is limited.

There is no specific antidote. In the event of an overdose, stop ZYTIGA, undertake general supportive measures, including monitoring for arrhythmias and cardiac failure and assess liver function.

## 11 DESCRIPTION

Abiraterone acetate, the active ingredient of ZYTIGA is the acetyl ester of abiraterone. Abiraterone is an inhibitor of CYP17 (17 $\alpha$ -hydroxylase/C17,20-lyase). Each ZYTIGA tablet contains either 250 mg or 500 mg of abiraterone acetate. Abiraterone acetate is designated chemically as (3 $\beta$ )-17-(3-pyridinyl) androsta-5,16-dien-3-yl acetate and its structure is:



Abiraterone acetate is a white to off-white, non-hygroscopic, crystalline powder. Its molecular formula is C<sub>26</sub>H<sub>33</sub>NO<sub>2</sub> and it has a molecular weight of 391.55. Abiraterone acetate is a lipophilic compound with an octanol-water partition coefficient of 5.12 (Log P) and is practically insoluble in water. The pK<sub>a</sub> of the aromatic nitrogen is 5.19.



ZYTIGA tablets are available in 500 mg film-coated tablets, 250 mg film-coated tablets and 250 mg uncoated tablets with the following inactive ingredients:

- 500 mg film-coated tablets: colloidal silicon dioxide, croscarmellose sodium, hypromellose, lactose monohydrate, magnesium stearate, silicified microcrystalline cellulose, and sodium lauryl sulfate. The coating, Opadry® II Purple, contains iron oxide black, iron oxide red, polyethylene glycol, polyvinyl alcohol, talc, and titanium dioxide.
- 250 mg film-coated tablets: colloidal silicon dioxide, croscarmellose sodium, lactose monohydrate, magnesium stearate, microcrystalline cellulose, povidone, and sodium lauryl sulfate. The coating, Opadry® II Beige, contains iron oxide red, iron oxide yellow, polyethylene glycol, polyvinyl alcohol, talc, and titanium dioxide.
- 250 mg uncoated tablets: colloidal silicon dioxide, croscarmellose sodium, lactose monohydrate, magnesium stearate, microcrystalline cellulose, povidone, and sodium lauryl sulfate.

## 12 CLINICAL PHARMACOLOGY

### 12.1 Mechanism of Action

Abiraterone acetate (ZYTIGA) is converted *in vivo* to abiraterone, an androgen biosynthesis inhibitor, that inhibits 17  $\alpha$ -hydroxylase/C17,20-lyase (CYP17). This enzyme is expressed in testicular, adrenal, and prostatic tumor tissues and is required for androgen biosynthesis.

CYP17 catalyzes two sequential reactions: 1) the conversion of pregnenolone and progesterone to their 17 $\alpha$ -hydroxy derivatives by 17 $\alpha$ -hydroxylase activity and 2) the subsequent formation of dehydroepiandrosterone (DHEA) and androstenedione, respectively, by C17, 20 lyase activity. DHEA and androstenedione are androgens and are precursors of testosterone. Inhibition of CYP17 by abiraterone can also result in increased mineralocorticoid production by the adrenals [*see Warnings and Precautions (5.1)*].

Androgen sensitive prostatic carcinoma responds to treatment that decreases androgen levels. Androgen deprivation therapies, such as treatment with GnRH agonists or orchiectomy, decrease androgen production in the testes but do not affect androgen production by the adrenals or in the tumor.

ZYTIGA decreased serum testosterone and other androgens in patients in the placebo-controlled clinical trial. It is not necessary to monitor the effect of ZYTIGA on serum testosterone levels.

Changes in serum prostate specific antigen (PSA) levels may be observed but have not been shown to correlate with clinical benefit in individual patients.

### 12.3 Pharmacokinetics

Following administration of abiraterone acetate, the pharmacokinetics of abiraterone and abiraterone acetate have been studied in healthy subjects and in patients with metastatic CRPC. *In vivo*, abiraterone acetate is converted to abiraterone. In clinical studies, abiraterone acetate plasma concentrations were below detectable levels (<0.2 ng/mL) in >99% of the analyzed samples.

#### Absorption

Following oral administration of abiraterone acetate to patients with metastatic CRPC, the median time to reach maximum plasma abiraterone concentrations is 2 hours. Abiraterone accumulation is observed at steady-state, with a 2-fold higher exposure (steady-state AUC) compared to a single 1,000 mg dose of abiraterone acetate.

At the dose of 1,000 mg daily in patients with metastatic CRPC, steady-state values (mean  $\pm$  SD) of  $C_{\max}$  were  $226 \pm 178$  ng/mL and of AUC were  $993 \pm 639$  ng.hr/mL. No major deviation from dose proportionality was observed in the dose range of 250 mg to 1,000 mg. However, the exposure was not significantly increased when the dose was doubled from 1,000 to 2,000 mg (8% increase in the mean AUC).

Systemic exposure of abiraterone is increased when abiraterone acetate is administered with food. In healthy subjects abiraterone  $C_{\max}$  and  $AUC_{0-\infty}$  were approximately 7- and 5-fold higher, respectively, when a single dose of abiraterone acetate was administered with a low-fat meal (7% fat, 300 calories) and approximately 17- and 10-fold higher, respectively, when a single dose of abiraterone acetate was administered with a high-fat (57% fat, 825 calories) meal compared to overnight fasting. Abiraterone  $AUC_{0-\infty}$  was approximately 7-fold or 1.6-fold higher, respectively, when a single dose of abiraterone acetate was administered 2 hours after or 1 hour before a medium fat meal (25% fat, 491 calories) compared to overnight fasting.

Systemic exposures of abiraterone in patients with metastatic CRPC, after repeated dosing of abiraterone acetate were similar when abiraterone acetate was taken with low-fat meals for 7 days and increased approximately 2-fold when taken with high-fat meals for 7 days compared to when taken at least 2 hours after a meal and at least 1 hour before a meal for 7 days.

Given the normal variation in the content and composition of meals, taking ZYTIGA with meals has the potential to result in increased and highly variable exposures. Therefore, no food should be consumed for at least two hours before the dose of ZYTIGA is taken and for at least one hour

after the dose of ZYTIGA is taken. The tablets should be swallowed whole with water [*see Dosage and Administration (2.3)*].

### Distribution and Protein Binding

Abiraterone is highly bound (>99%) to the human plasma proteins, albumin and alpha-1 acid glycoprotein. The apparent steady-state volume of distribution (mean  $\pm$  SD) is  $19,669 \pm 13,358$  L. *In vitro* studies show that at clinically relevant concentrations, abiraterone acetate and abiraterone are not substrates of P-glycoprotein (P-gp) and that abiraterone acetate is an inhibitor of P-gp.

### Metabolism

Following oral administration of  $^{14}\text{C}$ -abiraterone acetate as capsules, abiraterone acetate is hydrolyzed to abiraterone (active metabolite). The conversion is likely through esterase activity (the esterases have not been identified) and is not CYP mediated. The two main circulating metabolites of abiraterone in human plasma are abiraterone sulphate (inactive) and N-oxide abiraterone sulphate (inactive), which account for about 43% of exposure each. CYP3A4 and SULT2A1 are the enzymes involved in the formation of N-oxide abiraterone sulphate and SULT2A1 is involved in the formation of abiraterone sulphate.

### Excretion

In patients with metastatic CRPC, the mean terminal half-life of abiraterone in plasma (mean  $\pm$  SD) is  $12 \pm 5$  hours. Following oral administration of  $^{14}\text{C}$ -abiraterone acetate, approximately 88% of the radioactive dose is recovered in feces and approximately 5% in urine. The major compounds present in feces are unchanged abiraterone acetate and abiraterone (approximately 55% and 22% of the administered dose, respectively).

### Patients with Hepatic Impairment

The pharmacokinetics of abiraterone was examined in subjects with baseline mild (N=8) or moderate (N=8) hepatic impairment (Child-Pugh Class A and B, respectively) and in 8 healthy control subjects with normal hepatic function. Systemic exposure to abiraterone after a single oral 1,000 mg dose given under fasting conditions increased approximately 1.1-fold and 3.6-fold in subjects with mild and moderate baseline hepatic impairment, respectively. The mean half-life of abiraterone is prolonged to approximately 18 hours in subjects with mild hepatic impairment and to approximately 19 hours in subjects with moderate hepatic impairment.

In another trial, the pharmacokinetics of abiraterone were examined in subjects with baseline severe (N=8) hepatic impairment (Child-Pugh Class C) and in 8 healthy control subjects with normal hepatic function. The systemic exposure (AUC) of abiraterone increased by approximately 7-fold in subjects with severe baseline hepatic impairment compared to subjects

with normal hepatic function. In addition, the mean protein binding was found to be lower in the severe hepatic impairment group compared to the normal hepatic function group, which resulted in a two-fold increase in the fraction of free drug in patients with severe hepatic impairment [*see Dosage and Administration (2.4) and Use in Specific Populations (8.6)*].

### Patients with Renal Impairment

The pharmacokinetics of abiraterone were examined in patients with end-stage renal disease (ESRD) on a stable hemodialysis schedule (N=8) and in matched control subjects with normal renal function (N=8). In the ESRD cohort of the trial, a single 1,000 mg ZYTIGA dose was given under fasting conditions 1 hour after dialysis, and samples for pharmacokinetic analysis were collected up to 96 hours post dose. Systemic exposure to abiraterone after a single oral 1,000 mg dose did not increase in subjects with end-stage renal disease on dialysis, compared to subjects with normal renal function [*see Use in Specific Populations (8.7)*].

### Drug Interactions

*In vitro* studies with human hepatic microsomes showed that abiraterone has the potential to inhibit CYP1A2, CYP2D6, CYP2C8 and to a lesser extent CYP2C9, CYP2C19 and CYP3A4/5.

In an *in vivo* drug-drug interaction trial, the  $C_{max}$  and AUC of dextromethorphan (CYP2D6 substrate) were increased 2.8- and 2.9-fold, respectively when dextromethorphan 30 mg was given with abiraterone acetate 1,000 mg daily (plus prednisone 5 mg twice daily). The AUC for dextromethorphan, the active metabolite of dextromethorphan, increased approximately 1.3 fold [*see Drug Interactions (7.2)*].

In a clinical study to determine the effects of abiraterone acetate 1,000 mg daily (plus prednisone 5 mg twice daily) on a single 100 mg dose of the CYP1A2 substrate theophylline, no increase in systemic exposure of theophylline was observed.

Abiraterone is a substrate of CYP3A4, *in vitro*. In a clinical pharmacokinetic interaction study of healthy subjects pretreated with a strong CYP3A4 inducer (rifampin, 600 mg daily for 6 days) followed by a single dose of abiraterone acetate 1,000 mg, the mean plasma  $AUC_{\infty}$  of abiraterone was decreased by 55% [*see Drug Interactions (7.1)*].

In a separate clinical pharmacokinetic interaction study of healthy subjects, co-administration of ketoconazole, a strong inhibitor of CYP3A4, had no clinically meaningful effect on the pharmacokinetics of abiraterone [*see Drug Interactions (7.1)*].

In a CYP2C8 drug-drug interaction trial in healthy subjects, the AUC of pioglitazone was increased by 46% when pioglitazone was given together with a single dose of 1,000 mg abiraterone acetate [*see Drug Interactions (7.2)*].

*In vitro*, abiraterone and its major metabolites were shown to inhibit the hepatic uptake transporter OATP1B1. There are no clinical data available to confirm transporter based interaction.

## 12.6 QT Prolongation

In a multi-center, open-label, single-arm trial, 33 patients with metastatic CRPC received ZYTIGA orally at a dose of 1,000 mg once daily at least 1 hour before or 2 hours after a meal in combination with prednisone 5 mg orally twice daily. Assessments up to Cycle 2 Day 2 showed no large changes in the QTc interval (i.e., >20 ms) from baseline. However, small increases in the QTc interval (i.e., <10 ms) due to abiraterone acetate cannot be excluded due to study design limitations.

## 13 NONCLINICAL TOXICOLOGY

### 13.1 Carcinogenesis, Mutagenesis, and Impairment of Fertility

A two-year carcinogenicity study was conducted in rats at oral abiraterone acetate doses of 5, 15, and 50 mg/kg/day for males and 15, 50, and 150 mg/kg/day for females. Abiraterone acetate increased the combined incidence of interstitial cell adenomas and carcinomas in the testes at all dose levels tested. This finding is considered to be related to the pharmacological activity of abiraterone. Rats are regarded as more sensitive than humans to developing interstitial cell tumors in the testes. Abiraterone acetate was not carcinogenic in female rats at exposure levels up to 0.8 times the human clinical exposure based on AUC. Abiraterone acetate was not carcinogenic in a 6-month study in the transgenic (Tg.rasH2) mouse.

Abiraterone acetate and abiraterone was not mutagenic in an *in vitro* microbial mutagenesis (Ames) assay or clastogenic in an *in vitro* cytogenetic assay using primary human lymphocytes or an *in vivo* rat micronucleus assay.

In repeat-dose toxicity studies in male rats (13- and 26-weeks) and monkeys (39-weeks), atrophy, aspermia/hypospermia, and hyperplasia in the reproductive system were observed at  $\geq 50$  mg/kg/day in rats and  $\geq 250$  mg/kg/day in monkeys and were consistent with the antiandrogenic pharmacological activity of abiraterone. These effects were observed in rats at systemic exposures similar to humans and in monkeys at exposures approximately 0.6 times the AUC in humans.

In a fertility study in male rats, reduced organ weights of the reproductive system, sperm counts, sperm motility, altered sperm morphology and decreased fertility were observed in animals dosed for 4 weeks at  $\geq 30$  mg/kg/day orally. Mating of untreated females with males that received 30 mg/kg/day oral abiraterone acetate resulted in a reduced number of corpora lutea,

implantations and live embryos and an increased incidence of pre-implantation loss. Effects on male rats were reversible after 16 weeks from the last abiraterone acetate administration.

In a fertility study in female rats, animals dosed orally for 2 weeks until day 7 of pregnancy at  $\geq 30$  mg/kg/day had an increased incidence of irregular or extended estrous cycles and pre-implantation loss (300 mg/kg/day). There were no differences in mating, fertility, and litter parameters in female rats that received abiraterone acetate. Effects on female rats were reversible after 4 weeks from the last abiraterone acetate administration.

The dose of 30 mg/kg/day in rats is approximately 0.3 times the recommended dose of 1,000 mg/day based on body surface area.

In 13- and 26-week studies in rats and 13- and 39-week studies in monkeys, a reduction in circulating testosterone levels occurred with abiraterone acetate at approximately one half the human clinical exposure based on AUC. As a result, decreases in organ weights and toxicities were observed in the male and female reproductive system, adrenal glands, liver, pituitary (rats only), and male mammary glands. The changes in the reproductive organs are consistent with the antiandrogenic pharmacological activity of abiraterone acetate.

### **13.2 Animal Toxicology and/or Pharmacology**

A dose-dependent increase in cataracts was observed in rats after daily oral abiraterone acetate administration for 26 weeks starting at  $\geq 50$  mg/kg/day (similar to the human clinical exposure based on AUC). In a 39-week monkey study with daily oral abiraterone acetate administration, no cataracts were observed at higher doses (2 times greater than the clinical exposure based on AUC).

## **14 CLINICAL STUDIES**

The efficacy and safety of ZYTIGA with prednisone was established in three randomized placebo-controlled international clinical studies. All patients in these studies received a GnRH analog or had prior bilateral orchiectomy. Patients with prior ketoconazole treatment for prostate cancer and a history of adrenal gland or pituitary disorders were excluded from these trials. Concurrent use of spironolactone was not allowed during the study period.

### **COU-AA-301 (NCT00638690): Patients with metastatic CRPC who had received prior docetaxel chemotherapy**

A total of 1195 patients were randomized 2:1 to receive either ZYTIGA orally at a dose of 1,000 mg once daily in combination with prednisone 5 mg orally twice daily (N=797) or placebo once daily plus prednisone 5 mg orally twice daily (N=398). Patients randomized to either arm were to continue treatment until disease progression (defined as a 25% increase in PSA over the

patient’s baseline/nadir together with protocol-defined radiographic progression and symptomatic or clinical progression), initiation of new treatment, unacceptable toxicity or withdrawal.

The following patient demographics and baseline disease characteristics were balanced between the treatment arms. The median age was 69 years (range 39-95) and the racial distribution was 93% Caucasian, 3.6% Black, 1.7% Asian, and 1.6% Other. Eighty-nine percent of patients enrolled had an ECOG performance status score of 0-1 and 45% had a Brief Pain Inventory-Short Form score of  $\geq 4$  (patient’s reported worst pain over the previous 24 hours). Ninety percent of patients had metastases in bone and 30% had visceral involvement. Seventy percent of patients had radiographic evidence of disease progression and 30% had PSA-only progression. Seventy percent of patients had previously received one cytotoxic chemotherapy regimen and 30% received two regimens.

The protocol pre-specified interim analysis was conducted after 552 deaths and showed a statistically significant improvement in overall survival (OS) in patients treated with ZYTIGA with prednisone compared to patients in the placebo with prednisone arm (Table 9 and Figure 1). An updated survival analysis was conducted when 775 deaths (97% of the planned number of deaths for final analysis) were observed. Results from this analysis were consistent with those from the interim analysis (Table 7).

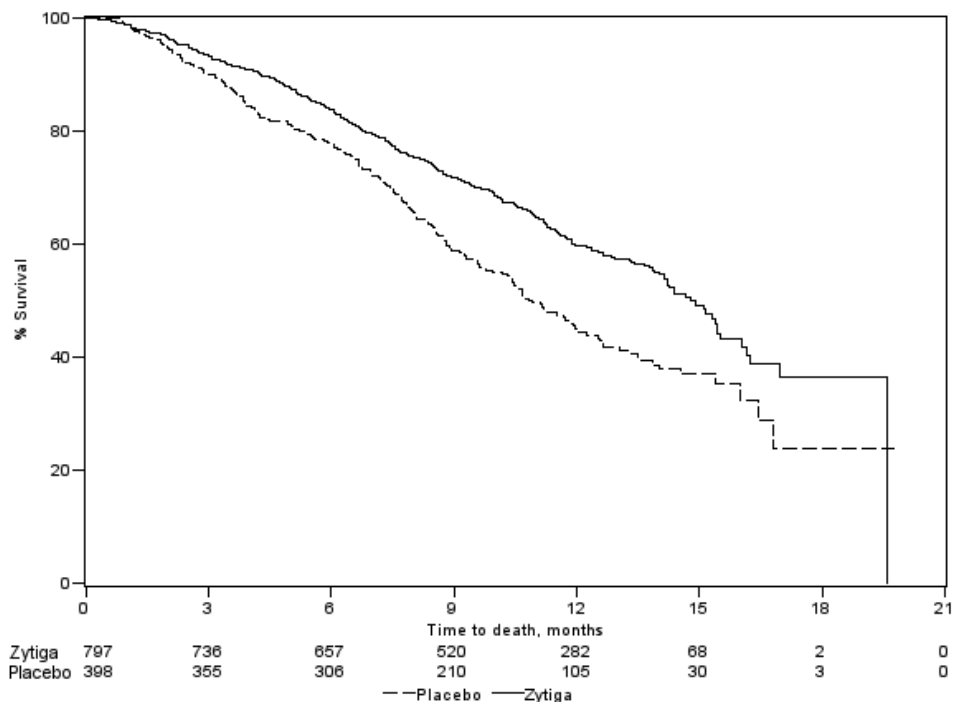
**Table 7: Overall Survival of Patients Treated with Either ZYTIGA or Placebo in Combination with Prednisone in COU-AA-301 (Intent-to-Treat Analysis)**

	ZYTIGA with Prednisone (N=797)	Placebo with Prednisone (N=398)
<b>Primary Survival Analysis</b>		
Deaths (%)	333 (42%)	219 (55%)
Median survival (months) (95% CI)	14.8 (14.1, 15.4)	10.9 (10.2, 12.0)
p-value <sup>1</sup>	<0.0001	
Hazard ratio (95% CI) <sup>2</sup>	0.646 (0.543, 0.768)	
<b>Updated Survival Analysis</b>		
Deaths (%)	501 (63%)	274 (69%)
Median survival (months) (95% CI)	15.8 (14.8, 17.0)	11.2 (10.4, 13.1)
Hazard ratio (95% CI) <sup>2</sup>	0.740 (0.638, 0.859)	

<sup>1</sup> p-value is derived from a log-rank test stratified by ECOG performance status score (0-1 vs. 2), pain score (absent vs. present), number of prior chemotherapy regimens (1 vs. 2), and type of disease progression (PSA only vs. radiographic).

<sup>2</sup> Hazard Ratio is derived from a stratified proportional hazards model. Hazard ratio <1 favors ZYTIGA with prednisone.

**Figure 1: Kaplan-Meier Overall Survival Curves in COU-AA-301 (Intent-to-Treat Analysis)**



**COU-AA-302 (NCT00887198): Patients with metastatic CRPC who had not received prior cytotoxic chemotherapy**

In COU-AA-302, 1088 patients were randomized 1:1 to receive either ZYTIGA orally at a dose of 1,000 mg once daily (N=546) or Placebo orally once daily (N=542). Both arms were given concomitant prednisone 5 mg twice daily. Patients continued treatment until radiographic or clinical (cytotoxic chemotherapy, radiation or surgical treatment for cancer, pain requiring chronic opioids, or ECOG performance status decline to 3 or more) disease progression, unacceptable toxicity or withdrawal. Patients with moderate or severe pain, opiate use for cancer pain, or visceral organ metastases were excluded.

Patient demographics were balanced between the treatment arms. The median age was 70 years. The racial distribution of patients treated with ZYTIGA was 95% Caucasian, 2.8% Black, 0.7% Asian and 1.1% Other. The ECOG performance status was 0 for 76% of patients, and 1 for 24% of patients. Co-primary efficacy endpoints were overall survival and radiographic progression-free survival (rPFS). Baseline pain assessment was 0-1 (asymptomatic) in 66% of patients and 2-3 (mildly symptomatic) in 26% of patients as defined by the Brief Pain Inventory-Short Form (worst pain over the last 24 hours).



Radiographic progression-free survival was assessed with the use of sequential imaging studies and was defined by bone scan identification of 2 or more new bone lesions with confirmation (Prostate Cancer Working Group 2 criteria) and/or modified Response Evaluation Criteria In Solid Tumors (RECIST) criteria for progression of soft tissue lesions. Analysis of rPFS utilized centrally-reviewed radiographic assessment of progression.

The planned final analysis for OS, conducted after 741 deaths (median follow up of 49 months) demonstrated a statistically significant OS improvement in patients treated with ZYTIGA with prednisone compared to those treated with placebo with prednisone (Table 8 and Figure 2). Sixty-five percent of patients on the ZYTIGA arm and 78% of patients on the placebo arm used subsequent therapies that may prolong OS in metastatic CRPC. ZYTIGA was used as a subsequent therapy in 13% of patients on the ZYTIGA arm and 44% of patients on the placebo arm.

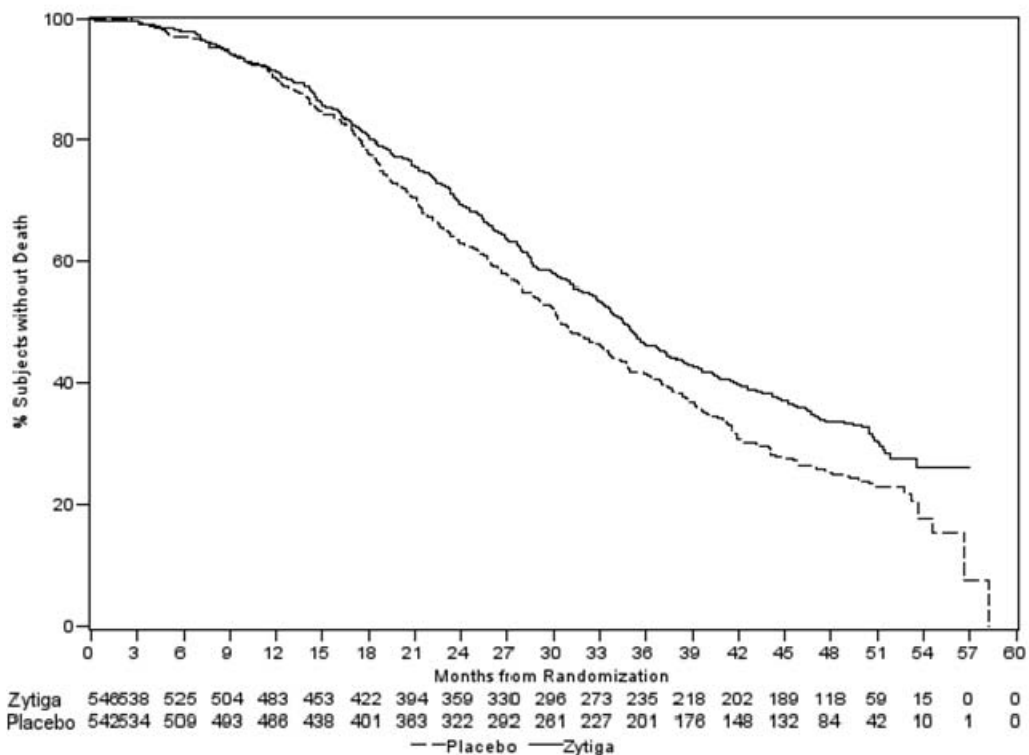
**Table 8: Overall Survival of Patients Treated with Either ZYTIGA or Placebo in Combination with Prednisone in COU-AA-302 (Intent-to-Treat Analysis)**

Overall Survival	ZYTIGA with Prednisone (N=546)	Placebo with Prednisone (N=542)
Deaths	354 (65%)	387 (71%)
Median survival (months) (95% CI)	34.7 (32.7, 36.8)	30.3 (28.7, 33.3)
p-value <sup>1</sup>	0.0033	
Hazard ratio <sup>2</sup> (95% CI)	0.81 (0.70, 0.93)	

<sup>1</sup> p-value is derived from a log-rank test stratified by ECOG performance status score (0 vs. 1).

<sup>2</sup> Hazard Ratio is derived from a stratified proportional hazards model. Hazard ratio <1 favors ZYTIGA with prednisone.

**Figure 2: Kaplan Meier Overall Survival Curves in COU-AA-302**



At the pre-specified rPFS analysis, 150 (28%) patients treated with ZYTIGA with prednisone and 251 (46%) patients treated with placebo with prednisone had radiographic progression. A significant difference in rPFS between treatment groups was observed (Table 9 and Figure 3).

**Table 9: Radiographic Progression-free Survival of Patients Treated with Either ZYTIGA or Placebo in Combination with Prednisone in COU-AA-302 (Intent-to-Treat Analysis)**

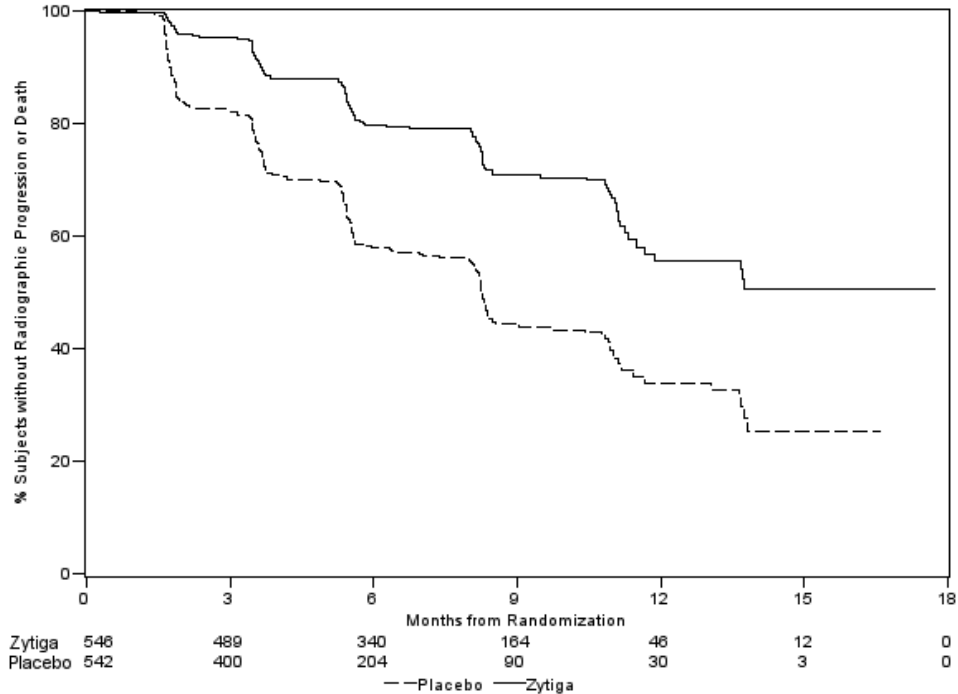
Radiographic Progression-free Survival	ZYTIGA with Prednisone (N=546)	Placebo with Prednisone (N=542)
Progression or death	150 (28%)	251 (46%)
Median rPFS (months) (95% CI)	NR (11.66, NR)	8.28 (8.12, 8.54)
p-value <sup>1</sup>	<0.0001	
Hazard ratio <sup>2</sup> (95% CI)	0.425 (0.347, 0.522)	

NR=Not reached.

<sup>1</sup> p-value is derived from a log-rank test stratified by ECOG performance status score (0 vs. 1).

<sup>2</sup> Hazard Ratio is derived from a stratified proportional hazards model. Hazard ratio <1 favors ZYTIGA with prednisone.

**Figure 3: Kaplan Meier Curves of Radiographic Progression-free Survival in COU-AA-302 (Intent-to-Treat Analysis)**



The primary efficacy analyses are supported by the following prospectively defined endpoints. The median time to initiation of cytotoxic chemotherapy was 25.2 months for patients in the ZYTIGA arm and 16.8 months for patients in the placebo arm (HR=0.580; 95% CI: [0.487, 0.691],  $p < 0.0001$ ).

The median time to opiate use for prostate cancer pain was not reached for patients receiving ZYTIGA and was 23.7 months for patients receiving placebo (HR=0.686; 95% CI: [0.566, 0.833],  $p=0.0001$ ). The time to opiate use result was supported by a delay in patient reported pain progression favoring the ZYTIGA arm.

**LATITUDE (NCT01715285): Patients with metastatic high-risk CSPC**

In LATITUDE, 1199 patients with metastatic high-risk CSPC were randomized 1:1 to receive either ZYTIGA orally at a dose of 1,000 mg once daily with prednisone 5 mg once daily (N=597) or placebos orally once daily (N=602). High-risk disease was defined as having at least two of three risk factors at baseline: a total Gleason score of  $\geq 8$ , presence of  $\geq 3$  lesions on bone scan, and evidence of measurable visceral metastases. Patients with significant cardiac, adrenal, or hepatic dysfunction were excluded. Patients continued treatment until radiographic or clinical disease progression, unacceptable toxicity, withdrawal or death. Clinical progression was defined

as the need for cytotoxic chemotherapy, radiation or surgical treatment for cancer, pain requiring chronic opioids, or ECOG performance status decline  $\geq 3$ .

Patient demographics were balanced between the treatment arms. The median age was 67 years. The racial distribution of patients treated with ZYTIGA was 69% Caucasian, 2.5% Black, 21% Asian, and 8.1% Other. The ECOG performance status was 0 for 55%, 1 for 42%, and 2 for 3.5% of patients. Baseline pain assessment was 0-1 (asymptomatic) in 50% of patients, 2-3 (mildly symptomatic) in 23% of patients, and  $\geq 4$  in 28% of patients as defined by the Brief Pain Inventory-Short Form (worst pain over the last 24 hours).

A major efficacy outcome was overall survival. The pre-specified interim analysis was conducted after 406 deaths and showed a statistically significant improvement in OS in patients on ZYTIGA with prednisone compared to those on placebos (see Table 10 and Figure 4). Twenty-one percent of patients on the ZYTIGA arm and 41% of patients on the placebo arm received subsequent therapies that may prolong OS in metastatic CRPC, including cytotoxic chemotherapy, abiraterone acetate, enzalutamide, and systemic radiotherapy.

**Table 10: Overall Survival of Patients Treated with Either ZYTIGA in Combination with Prednisone or Placebos in LATITUDE (Intent-to-Treat Analysis)**

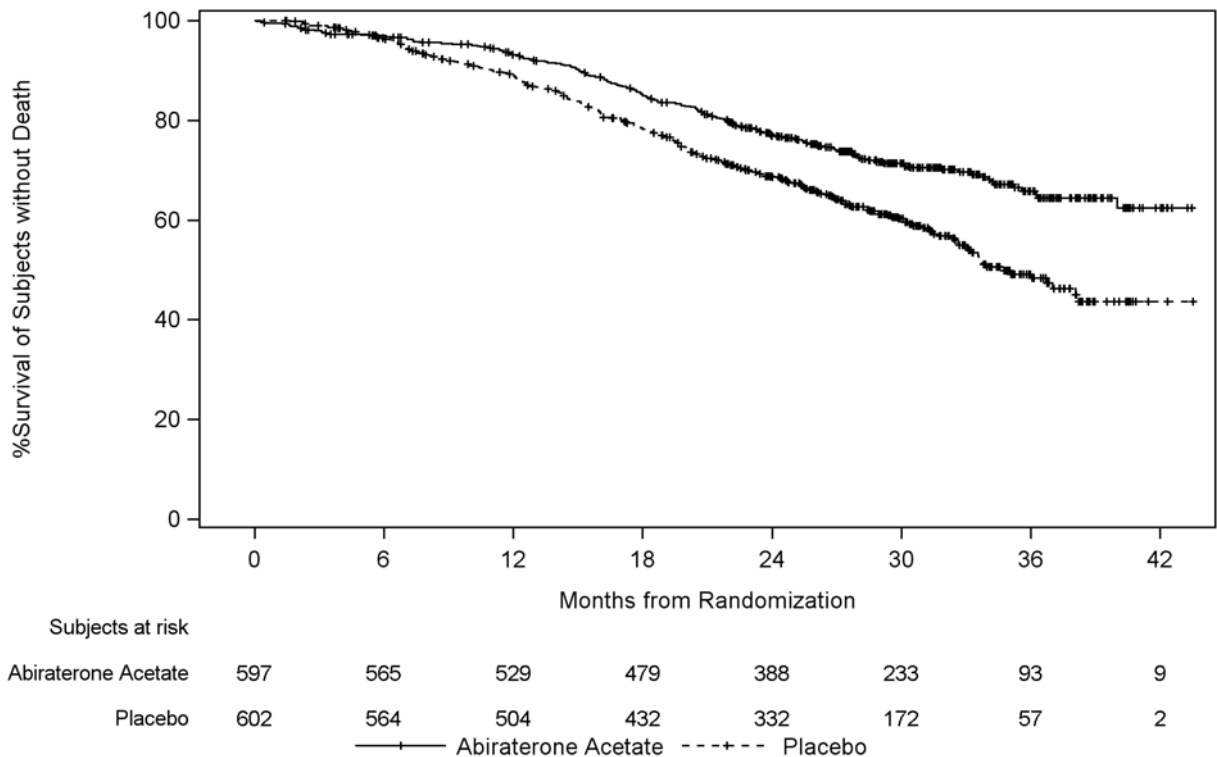
Overall Survival	ZYTIGA with Prednisone (N=597)	Placebos (N=602)
Deaths	169 (28%)	237 (39%)
Median survival (months) (95% CI)	NE	34.7 (33.1, NE)
p-value <sup>1</sup>	< 0.0001	
Hazard ratio <sup>2</sup> (95% CI)	0.621 (0.509, 0.756)	

NE=Not estimable.

<sup>1</sup> p value is from log-rank test stratified by ECOG PS score (0/1 or 2) and visceral (absent or present)

<sup>2</sup> Hazard Ratio is derived from a stratified proportional hazards model. Hazard ratio <1 favors ZYTIGA with prednisone.

Figure 4: Kaplan-Meier Plot of Overall Survival; Intent-to-treat Population in LATITUDE



The major efficacy outcome was supported by a statistically significant delay in time to initiation of chemotherapy for patients in the ZYTIGA arm compared to those in the placebo arm. The median time to initiation of chemotherapy was not reached for patients on ZYTIGA with prednisone and was 38.9 months for patients on placebo (HR = 0.44; 95% CI: [0.35, 0.56],  $p < 0.0001$ ).

## 16 HOW SUPPLIED/STORAGE AND HANDLING

ZYTIGA<sup>®</sup> (abiraterone acetate) Tablets are available in the strengths and packages listed below:

- ZYTIGA<sup>®</sup> 500 mg film-coated Tablets**  
 Purple, oval-shaped tablets debossed with “AA” one side and “500” on the other side.  
 NDC 57894-195-06 60 tablets available in high-density polyethylene bottles
- ZYTIGA<sup>®</sup> 250 mg film-coated Tablets**  
 Pink, oval-shaped tablets debossed with “AA250” on one side.  
 NDC 57894-184-12 120 tablets available in high-density polyethylene bottles
- ZYTIGA<sup>®</sup> 250 mg uncoated Tablets**  
 White to off-white, oval-shaped tablets debossed with “AA250” on one side.  
 NDC 57894-150-12 120 tablets available in high-density polyethylene bottles

### Storage and Handling

Store at 20°C to 25°C (68°F to 77°F); excursions permitted in the range from 15°C to 30°C (59°F to 86°F) [*see USP Controlled Room Temperature*].

Keep out of reach of children.

Based on its mechanism of action, ZYTIGA may harm a developing fetus. Women who are pregnant or women who may be pregnant should not handle ZYTIGA 250 mg uncoated tablets or other ZYTIGA tablets if broken, crushed, or damaged without protection, e.g., gloves [*see Use in Specific Populations (8.1)*].

## **17 PATIENT COUNSELING INFORMATION**

*Advise the patient to read the FDA-approved patient labeling (Patient Information)*

### Hypertension, Hypokalemia, and Fluid Retention

- Inform patients that ZYTIGA is associated with hypertension, hypokalemia, and peripheral edema. Advise patients to report symptoms of hypertension, hypokalemia, or edema to their healthcare provider [*see Warnings and Precautions (5.1)*].

### Adrenocortical Insufficiency

- Inform patients that ZYTIGA with prednisone is associated with adrenal insufficiency. Advise patients to report symptoms of adrenocortical insufficiency to their healthcare provider [*see Warnings and Precautions (5.2)*].

### Hepatotoxicity

- Inform patients that ZYTIGA is associated with severe hepatotoxicity. Inform patients that their liver function will be monitored using blood tests. Advise patients to immediately report symptoms of hepatotoxicity to their healthcare provider [*see Warnings and Precautions (5.3)*].

### Dosing and Administration

- Inform patients that ZYTIGA is taken once daily with prednisone (once or twice daily according to their healthcare provider's instructions) and to not interrupt or stop either of these medications without consulting their healthcare provider.
- Inform patients receiving GnRH therapy that they need to maintain this treatment during the course of treatment with ZYTIGA.
- Instruct patients to take ZYTIGA on an empty stomach, either one hour before or two hours after a meal. ZYTIGA taken with food causes increased exposure and may result in adverse reactions. Instruct patients to swallow tablets whole with water and not to crush or chew the tablets [*see Dosage and Administration (2.3)*].

- Inform patients that if they miss a dose of ZYTIGA or prednisone, they should take their normal dose the following day. If more than one daily dose is skipped, inform patients to contact their healthcare provider [*see Dosage and Administration (2.3)*].

#### Fetal Toxicity

- Inform patients that ZYTIGA may harm a developing fetus. Advise males with female partners of reproductive potential to use effective contraception during treatment and for 3 weeks after the final dose of ZYTIGA [*see Use in Specific Populations (8.1)*].
- Women who are pregnant or women who may be pregnant should not handle ZYTIGA 250 mg uncoated tablets or other ZYTIGA tablets if broken, crushed, or damaged without protection, e.g., gloves [*see Use in Specific Populations (8.1) and How Supplied/Storage and Handling (16)*].

#### Infertility

- Advise male patients that ZYTIGA may impair fertility [*see Use in Specific Populations (8.3)*].

#### **500 mg Tablets**

##### **Manufactured by:**

Patheon France S.A.S.

Bourgoin Jallieu, France

#### **250 mg Tablets**

##### **Manufactured by:**

Patheon Inc.

Mississauga, Canada

##### **Manufactured for:**

Janssen Biotech, Inc.

Horsham, PA 19044

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Revised: 02/2018

**PATIENT INFORMATION**  
**ZYTIGA® (Zye-tee-ga)**  
**(abiraterone acetate)**  
**Tablets**

Read this Patient Information that comes with ZYTIGA before you start taking it and each time you get a refill. There may be new information. This information does not take the place of talking with your healthcare provider about your medical condition or your treatment.

**What is ZYTIGA?**

ZYTIGA is a prescription medicine that is used along with prednisone. ZYTIGA is used to treat men with prostate cancer that has spread to other parts of the body.

ZYTIGA is not for use in women.

It is not known if ZYTIGA is safe or effective in children.

**Who should not take ZYTIGA?**

**ZYTIGA is not for use in women.**

Do not take ZYTIGA if you are pregnant or may become pregnant. ZYTIGA may harm your unborn baby. Women who are pregnant or who may become pregnant should not touch ZYTIGA 250 mg uncoated tablets or other ZYTIGA tablets if broken, crushed, or damaged without protection, such as gloves.

**What should I tell my healthcare provider before taking ZYTIGA?**

**Before you take ZYTIGA, tell your healthcare provider if you:**

- have heart problems
- have liver problems
- have a history of adrenal problems
- have a history of pituitary problems
- have any other medical conditions
- plan to become pregnant. See **“Who should not take ZYTIGA?”**
- are breastfeeding or plan to breastfeed. It is not known if ZYTIGA passes into your breast milk. You and your healthcare provider should decide if you will take ZYTIGA or breastfeed. You should not do both. See **“Who should not take ZYTIGA?”**

**Tell your healthcare provider about all the medicines you take**, including prescription and over-the-counter medicines, vitamins, and herbal supplements. ZYTIGA can interact with many other medicines. You should not start or stop any medicine before you talk with the healthcare provider that prescribed ZYTIGA.

Know the medicines you take. Keep a list of them with you to show to your healthcare provider and pharmacist when you get a new medicine.

**How should I take ZYTIGA?**

- Take ZYTIGA and prednisone exactly as your healthcare provider tells you.
- Take your prescribed dose of ZYTIGA 1 time a day.
- Your healthcare provider may change your dose if needed.
- Do not stop taking your prescribed dose of ZYTIGA or prednisone without talking with your healthcare provider first.
- Take ZYTIGA on an empty stomach. **Do not take ZYTIGA with food.** Taking ZYTIGA with food may cause more of the medicine to be absorbed by the body than is needed and this may cause side effects.
- No food should be eaten 2 hours before and 1 hour after taking ZYTIGA.



- Swallow ZYTIGA tablets whole. Do not crush or chew tablets.
- Take ZYTIGA tablets with water.
- Men who are sexually active with a pregnant woman must use a condom during and for 1 week after treatment with ZYTIGA. If their female partner may become pregnant, a condom and another form of birth control must be used during and for 1 week after treatment with ZYTIGA. Talk with your healthcare provider if you have questions about birth control.
- If you miss a dose of ZYTIGA or prednisone, take your prescribed dose the following day. If you miss more than 1 dose, tell your healthcare provider right away.
- Your healthcare provider will do blood tests to check for side effects.

#### **What are the possible side effects of ZYTIGA?**

##### **ZYTIGA may cause serious side effects including:**

- **High blood pressure (hypertension), low blood potassium levels (hypokalemia) and fluid retention (edema).** Tell your healthcare provider if you get any of the following symptoms:
  - dizziness
  - fast heartbeats
  - feel faint or lightheaded
  - headache
  - confusion
  - muscle weakness
  - pain in your legs
  - swelling in your legs or feet
- **Adrenal problems** may happen if you stop taking prednisone, get an infection, or are under stress.
- **Liver problems.** You may develop changes in liver function blood test. Your healthcare provider will do blood tests to check your liver before treatment with ZYTIGA and during treatment with ZYTIGA. Liver failure may occur, which can lead to death. Tell your healthcare provider if you notice any of the following changes:
  - yellowing of the skin or eyes
  - darkening of the urine
  - severe nausea or vomiting

##### The most common side effects of ZYTIGA include:

- feeling very tired
- joint pain
- high blood pressure
- nausea
- swelling in your legs or feet
- low blood potassium levels
- hot flushes
- diarrhea
- vomiting
- infected nose, sinuses, or throat (cold)
- cough
- headache
- low red blood cells (anemia)
- high blood cholesterol and triglycerides
- high blood sugar levels
- certain other abnormal blood tests

Tell your healthcare provider if you have any side effect that bothers you or that does not go away.

These are not all the possible side effects of ZYTIGA. For more information, ask your healthcare provider or pharmacist.

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

#### **How should I store ZYTIGA?**

- Store ZYTIGA at room temperature between 68°F to 77°F (20°C to 25°C).

**Keep ZYTIGA and all medicines out of the reach of children.**

#### **General information about ZYTIGA.**

Medicines are sometimes prescribed for purposes other than those listed in a Patient Information leaflet.

Do not use ZYTIGA for a condition for which it was not prescribed. Do not give ZYTIGA to other people, even if they have the same symptoms that you have. It may harm them.

This leaflet summarizes the most important information about ZYTIGA. If you would like more information, talk with your healthcare provider. You can ask your healthcare provider or pharmacist for information about ZYTIGA that is written for health professionals.

For more information, call Janssen Biotech, Inc. at 1-800-526-7736 (1-800-JANSSEN) or go to [www.Zytiga.com](http://www.Zytiga.com).

#### **What are the ingredients of ZYTIGA?**

**Active ingredient:** abiraterone acetate

#### **Inactive ingredients:**

500 mg film-coated tablets: colloidal silicon dioxide, croscarmellose sodium, hypromellose, lactose monohydrate, magnesium stearate, silicified microcrystalline cellulose, and sodium lauryl sulfate. The film-coating contains iron oxide black, iron oxide red, polyethylene glycol, polyvinyl alcohol, talc, and titanium dioxide.

250 mg film-coated tablets: colloidal silicon dioxide, croscarmellose sodium, lactose monohydrate, magnesium stearate, microcrystalline cellulose, povidone, and sodium lauryl sulfate. The film-coating contains iron oxide red, iron oxide yellow, polyethylene glycol, polyvinyl alcohol, talc, and titanium dioxide.

250 mg uncoated tablets: colloidal silicon dioxide, croscarmellose sodium, lactose monohydrate, magnesium stearate, microcrystalline cellulose, povidone, and sodium lauryl sulfate.

#### **500 mg Tablets**

**Manufactured by:** Patheon France S.A.S., Bourgoin Jallieu, France

#### **250 mg Tablets**

**Manufactured by:** Patheon Inc., Mississauga, Canada

**Manufactured for:** Janssen Biotech, Inc., Horsham, PA 19044

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This Patient Information has been approved by the U.S. Food and Drug Administration.

Revised: Feb 2018