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**HIGHLIGHTS OF PRESCRIBING INFORMATION**
**These highlights do not include all the information needed to use YERVOY safely and effectively. See full prescribing information for YERVOY.**

**YERVOY® (ipilimumab) injection, for intravenous use**
**Initial U.S. Approval: 2011**

**WARNING: IMMUNE-MEDIATED ADVERSE REACTIONS**
***See full prescribing information for complete boxed warning.***

**YERVOY can result in severe and fatal immune-mediated adverse reactions. These immune-mediated reactions may involve any organ system; however, the most common severe immune-mediated adverse reactions are enterocolitis, hepatitis, dermatitis (including toxic epidermal necrolysis), neuropathy, and endocrinopathy. The majority of these immune-mediated reactions initially manifested during treatment; however, a minority occurred weeks to months after discontinuation of YERVOY.**

**Permanently discontinue YERVOY and initiate systemic high-dose corticosteroid therapy for severe immune-mediated reactions. (2.8)**

**Assess patients for signs and symptoms of enterocolitis, dermatitis, neuropathy, and endocrinopathy and evaluate clinical chemistries including liver function tests, adrenocorticotropic hormone (ACTH) level, and thyroid function tests at baseline and before each dose. (5.1, 5.2, 5.3, 5.4, 5.5)**

**----------RECENT MAJOR CHANGES----------**

| | |
|---|---|
| Indications and Usage (1) | 5/2020 |
| Dosage and Administration (2) | 5/2020 |
| Warnings and Precautions (5) | 5/2020 |

**----------INDICATIONS AND USAGE----------**

YERVOY is a human cytotoxic T-lymphocyte antigen 4 (CTLA-4)-blocking antibody indicated for:

Melanoma

- Treatment of unresectable or metastatic melanoma in adults and pediatric patients (12 years and older). (1.1)
- Adjuvant treatment of patients with cutaneous melanoma with pathologic involvement of regional lymph nodes of more than 1 mm who have undergone complete resection, including total lymphadenectomy. (1.2)

Renal Cell Carcinoma (RCC)

- Treatment of patients with intermediate or poor-risk, previously untreated advanced renal cell carcinoma, in combination with nivolumab. (1.3)

Colorectal Cancer

- Treatment of adult and pediatric patients 12 years of age and older with microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR) metastatic colorectal cancer that has progressed following treatment with a fluoropyrimidine, oxaliplatin, and irinotecan, in combination with nivolumab. This indication is approved under accelerated approval based on overall response rate and duration of response. Continued approval for this indication may be contingent upon verification and description of clinical benefit in confirmatory trials. (1.4)

Hepatocellular Carcinoma

- Treatment of patients with hepatocellular carcinoma who have been previously treated with sorafenib, in combination with nivolumab. This indication is approved under accelerated approval based on overall response rate and duration of response. Continued approval for this indication may be contingent upon verification and description of clinical benefit in confirmatory trials. (1.5)

Non-Small Cell Lung Cancer (NSCLC)

- Treatment of adult patients with metastatic non-small cell lung cancer expressing PD-L1 (≥1%) as determined by an FDA-approved test, with no EGFR or ALK genomic tumor aberrations, as first-line treatment in combination with nivolumab. (1.6)
- Treatment of adult patients with metastatic or recurrent non-small cell lung cancer with no EGFR or ALK genomic tumor aberrations as first-line treatment, in combination with ipilimumab and 2 cycles of platinum-doublet chemotherapy (1.6)

**----------DOSAGE AND ADMINISTRATION----------**

- Administer by intravenous infusion based upon recommended infusion rate for each indication. (2)
- Unresectable or metastatic melanoma:
  - o YERVOY 3 mg/kg every 3 weeks for a total of 4 doses. (2.2)
- Adjuvant melanoma:
  - o YERVOY 10 mg/kg every 3 weeks for 4 doses, followed by 10 mg/kg every 12 weeks for up to 3 years or until documented disease recurrence or unacceptable toxicity. (2.3)
- Advanced renal cell carcinoma:
  - o Nivolumab 3 mg/kg followed by YERVOY 1 mg/kg on the same day, every 3 weeks for 4 doses, then nivolumab 240 mg every 2 weeks or 480 mg every 4 weeks. (2.4)
- Microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR) metastatic colorectal cancer:
  - o Nivolumab 3 mg/kg followed by YERVOY 1 mg/kg on the same day every 3 weeks for 4 doses, then nivolumab 240 mg every 2 weeks or 480 mg every 4 weeks. (2.5)
- Hepatocellular carcinoma:
  - o Nivolumab 1 mg/kg followed by YERVOY 3 mg/kg on the same day every 3 weeks for 4 doses, then nivolumab 240 mg every 2 weeks or 480 mg every 4 weeks. (2.6)
- Metastatic non-small cell lung cancer
  - o Nivolumab 3 mg/kg every 2 weeks with YERVOY 1 mg/kg every 6 weeks. (2.7)
  - o Nivolumab 360 mg every 3 weeks with YERVOY 1 mg/kg every 6 weeks and 2 cycles of platinum-doublet chemotherapy. (2.7)
- Permanently discontinue for severe adverse reactions. (2.8)

**----------DOSAGE FORMS AND STRENGTHS----------**

Injection: 50 mg/10 mL (5 mg/mL) and 200 mg/40 mL (5 mg/mL) in a single-use vial. (3)

**----------CONTRAINDICATIONS----------**

None. (4)

**----------WARNINGS AND PRECAUTIONS----------**

Immune-mediated adverse reactions: Permanently discontinue for severe reactions. Withhold dose for moderate immune-mediated adverse reactions until return to baseline, improvement to mild severity, or complete resolution, and patient is receiving less than 7.5 mg prednisone or equivalent per day. Administer systemic high-dose corticosteroids for severe, persistent, or recurring immune-mediated reactions. (5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 5.9, 5.10)

- Immune-mediated hepatitis: Evaluate liver function tests before each dose of YERVOY. (5.2) Withhold for moderate and permanently discontinue for severe or life-threatening transaminase or total bilirubin elevation. (5.2)
- Immune-mediated endocrinopathies: Monitor clinical chemistries, ACTH level, and thyroid function tests prior to each dose. Evaluate at each visit for signs and symptoms of endocrinopathy. Institute hormone replacement therapy as needed. (5.5)
- Immune-mediated pneumonitis: Withhold for moderate and permanently discontinue for severe or life-threatening pneumonitis. (5.6)
- Immune-mediated nephritis and renal dysfunction: Monitor for changes in renal function. Withhold for moderate or severe and permanently discontinue for life-threatening serum creatinine elevation. (5.7)
- Immune-mediated encephalitis: Monitor for changes in neurologic function. Withhold for new-onset moderate to severe neurological signs or symptoms and permanently discontinue for immune-mediated encephalitis. (5.8)
- Infusion reactions: Discontinue for severe and life-threatening infusion reactions. Interrupt or slow the rate of infusion in patients with mild or moderate infusion reactions. (5.9)
- Embryo-Fetal toxicity: Can cause fetal harm. Advise of potential risk to a fetus and use of effective contraception. (5.11, 8.1, 8.3)

**----------ADVERSE REACTIONS----------**

Most common adverse reactions (≥5%) with YERVOY as a single agent are fatigue, diarrhea, pruritus, rash, and colitis. Additional common adverse reactions at the 10 mg/kg dose (≥5%) include nausea, vomiting, headache, weight loss, pyrexia, decreased appetite, and insomnia. (6.1)

Most common adverse reactions (≥20%) with YERVOY in combination with nivolumab are fatigue, rash, pruritus, diarrhea, musculoskeletal pain, cough,



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pyrexia, decreased appetite, nausea, abdominal pain, arthralgia, headache, vomiting, dyspnea, dizziness, hypothyroidism, and decreased weight. (6.1)

Most common adverse reactions (≥20%) with YERVOY in combination with nivolumab and platinum-doublet chemotherapy are fatigue, musculoskeletal pain, nausea, diarrhea, rash, decreased appetite, constipation, and pruritus. (6.1)

**To report SUSPECTED ADVERSE REACTIONS, contact Bristol-Myers Squibb at 1-800-721-5072 or FDA at 1-800-FDA-1088 or *www.fda.gov/medwatch*.**

**----------USE IN SPECIFIC POPULATIONS----------**

- Lactation: Discontinue breastfeeding during treatment with YERVOY. (8.2)

**See 17 for PATIENT COUNSELING INFORMATION and Medication Guide.**

**Revised: 5/2020**

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# FULL PRESCRIBING INFORMATION

## WARNING: IMMUNE-MEDIATED ADVERSE REACTIONS

**YERVOY can result in severe and fatal immune-mediated adverse reactions. These immune-mediated reactions may involve any organ system; however, the most common severe immune-mediated adverse reactions are enterocolitis, hepatitis, dermatitis (including toxic epidermal necrolysis), neuropathy, and endocrinopathy. The majority of these immune-mediated reactions initially manifested during treatment; however, a minority occurred weeks to months after discontinuation of YERVOY.**

**Permanently discontinue YERVOY and initiate systemic high-dose corticosteroid therapy for severe immune-mediated reactions *[see Dosage and Administration (2.8)]*.**

**Assess patients for signs and symptoms of enterocolitis, dermatitis, neuropathy, and endocrinopathy, and evaluate clinical chemistries including liver function tests, adrenocorticotropic hormone (ACTH) level, and thyroid function tests, at baseline and before each dose *[see Warnings and Precautions (5.1, 5.2, 5.3, 5.4, 5.5)]*.**

## 1 INDICATIONS AND USAGE

### 1.1 Unresectable or Metastatic Melanoma

YERVOY is indicated for the treatment of unresectable or metastatic melanoma in adults and pediatric patients (12 years and older) *[see Clinical Studies (14.1)]*.

### 1.2 Adjuvant Treatment of Melanoma

YERVOY is indicated for the adjuvant treatment of patients with cutaneous melanoma with pathologic involvement of regional lymph nodes of more than 1 mm who have undergone complete resection, including total lymphadenectomy *[see Clinical Studies (14.2)]*.

### 1.3 Advanced Renal Cell Carcinoma

YERVOY, in combination with nivolumab, is indicated for the treatment of patients with intermediate or poor-risk, previously untreated advanced renal cell carcinoma (RCC) *[see Clinical Studies (14.3)]*.

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### 1.4 Microsatellite Instability-High (MSI-H) or Mismatch Repair Deficient (dMMR) Metastatic Colorectal Cancer

YERVOY, in combination with nivolumab, is indicated for the treatment of adult and pediatric patients 12 years of age and older with microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR) metastatic colorectal cancer (CRC) that has progressed following treatment with a fluoropyrimidine, oxaliplatin, and irinotecan *[see Clinical Studies (14.4)]*. This indication is approved under accelerated approval based on overall response rate and duration of response. Continued approval for this indication may be contingent upon verification and description of clinical benefit in confirmatory trials.

### 1.5 Hepatocellular Carcinoma

YERVOY, in combination with nivolumab, is indicated for the treatment of patients with hepatocellular carcinoma (HCC) who have been previously treated with sorafenib. This indication is approved under accelerated approval based on overall response rate and duration of response *[see Clinical Studies (14.5)]*. Continued approval for this indication may be contingent upon verification and description of clinical benefit in the confirmatory trials.

### 1.6 Metastatic Non-Small Cell Lung Cancer

YERVOY, in combination with nivolumab, is indicated for the first-line treatment of adult patients with metastatic non-small cell lung cancer (NSCLC) whose tumors express PD-L1 (≥1%) as determined by an FDA-approved test *[see Dosage and Administration (2.1)]*, with no EGFR or ALK genomic tumor aberrations.

YERVOY, in combination with nivolumab and 2 cycles of platinum-doublet chemotherapy, is indicated for the first-line treatment of adult patients with metastatic or recurrent NSCLC, with no EGFR or ALK genomic tumor aberrations.

## 2 DOSAGE AND ADMINISTRATION

### 2.1 Patient Selection

Select patients with metastatic NSCLC for treatment with YERVOY in combination with nivolumab based on PD-L1 expression *[see Clinical Studies (14.6)]*.

Information on FDA-approved tests for the determination of PD-L1 expression in NSCLC is available at: http://www.fda.gov/CompanionDiagnostics.

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## 2.2 Recommended Dosing for Unresectable or Metastatic Melanoma

The recommended dose of YERVOY is 3 mg/kg administered as an intravenous infusion over 90 minutes every 3 weeks for a maximum of 4 doses. In the event of toxicity, doses may be delayed, but all treatment must be administered within 16 weeks of the first dose *[see Clinical Studies (14.1)]*.

## 2.3 Recommended Dosing for Adjuvant Treatment of Melanoma

The recommended dose of YERVOY is 10 mg/kg administered as an intravenous infusion over 90 minutes every 3 weeks for 4 doses followed by 10 mg/kg every 12 weeks for up to 3 years *[see Clinical Studies (14.2)]*. In the event of toxicity, doses are omitted, not delayed.

## 2.4 Recommended Dosing for Renal Cell Carcinoma

The recommended dosage is YERVOY 1 mg/kg administered as an intravenous infusion over 30 minutes, immediately following nivolumab administered on the same day, every 3 weeks for up to 4 doses or until intolerable toxicity or disease progression *[see Clinical Studies (14.3)]*. After completing 4 doses of the combination, administer nivolumab as a single agent. Review the Prescribing Information for nivolumab for full dosing and schedule information.

## 2.5 Recommended Dosing for Colorectal Cancer

The recommended dosage is YERVOY 1 mg/kg administered as an intravenous infusion over 30 minutes, immediately following nivolumab administered on the same day, every 3 weeks for up to 4 doses or until intolerable toxicity or disease progression *[see Clinical Studies (14.4)]*. After completing 4 doses of the combination, administer nivolumab as a single agent. Review the Prescribing Information for nivolumab for full dosing and schedule information.

## 2.6 Recommended Dosing for Hepatocellular Carcinoma

The recommended dosage is YERVOY 3 mg/kg administered as an intravenous infusion over 30 minutes, immediately following nivolumab administered on the same day, every 3 weeks for up to 4 doses or until intolerable toxicity or disease progression *[see Clinical Studies (14.5)]*. After completing 4 doses of the combination, administer nivolumab as a single agent. Review the Prescribing Information for nivolumab for full dosing and schedule information.

## 2.7 Recommended Dosing for Metastatic NSCLC

The recommended dose of YERVOY in combination with nivolumab is nivolumab 3 mg/kg administered as an intravenous infusion over 30 minutes every 2 weeks and YERVOY 1 mg/kg administered as an intravenous infusion over 30 minutes every 6 weeks until disease progression,

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unacceptable toxicity, or for up to 2 years in patients without disease progression *[see Clinical Studies (14.6)]*. Review the Prescribing Information for nivolumab for recommended dosing information.

The recommended dose of YERVOY in combination with nivolumab and platinum-doublet chemotherapy is nivolumab 360 mg administered as an intravenous infusion over 30 minutes every 3 weeks and YERVOY 1 mg/kg administered as an intravenous infusion over 30 minutes every 6 weeks and **histology-based platinum-doublet chemotherapy every 3 weeks for 2 cycles** until disease progression, unacceptable toxicity, or up to 2 years in patients without disease progression *[see Clinical Studies (14.6)]*. Review the Prescribing Information for nivolumab and platinum-based chemotherapy for recommended dosing information.

## 2.8 Recommended Dose Modifications

Recommendations for YERVOY modifications are provided in Table 1. When YERVOY is administered in combination with nivolumab, if YERVOY is withheld, nivolumab should also be withheld. Review the Prescribing Information for nivolumab for recommended dose modifications.

Interrupt or slow the rate of infusion in patients with mild or moderate infusion reactions. Discontinue in patients with severe or life-threatening infusion reactions.

**Table 1: Recommended Treatment Modifications for Immune-Mediated Adverse Reactions of YERVOY**

| Target/Organ System | Adverse Reaction (CTCAE v4) | Treatment Modification |
|---|---|---|
| Endocrine | Symptomatic endocrinopathy | Withhold YERVOY<br>Resume YERVOY in patients with complete or partial resolution of adverse reactions (Grade 0 to 1) and who are receiving less than 7.5 mg prednisone or equivalent per day. |
| | • Symptomatic reactions lasting 6 weeks or longer<br>• Inability to reduce corticosteroid dose to 7.5 mg prednisone or equivalent per day | Permanently discontinue YERVOY |
| Ophthalmologic | Grade 2 through 4 reactions<br>• not improving to Grade 1 within 2 weeks while receiving topical therapy or<br>• requiring systemic treatment | Permanently discontinue YERVOY |

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**Table 1: Recommended Treatment Modifications for Immune-Mediated Adverse Reactions of YERVOY**

| Target/Organ System | Adverse Reaction (CTCAE v4) | Treatment Modification |
|---|---|---|
| All Other | Grade 2 | Withhold YERVOY<br>Resume YERVOY in patients with complete or partial resolution of adverse reactions (Grade 0 to 1) and who are receiving less than 7.5 mg prednisone or equivalent per day. |
| | • Grade 2 reactions lasting 6 weeks or longer<br>• Inability to reduce corticosteroid dose to 7.5 mg prednisone or equivalent per day<br>• Grade 3 or 4 | Permanently discontinue YERVOY |

## 2.9 Preparation and Administration

- Do not shake product.
- Inspect parenteral drug products visually for particulate matter and discoloration prior to administration. Discard vial if solution is cloudy, there is pronounced discoloration (solution may have pale-yellow color), or there is foreign particulate matter other than translucent-to-white, amorphous particles.

### Preparation of Solution

- Allow the vials to stand at room temperature for approximately 5 minutes prior to preparation of infusion.
- Withdraw the required volume of YERVOY and transfer into an intravenous bag.
- Dilute with 0.9% Sodium Chloride Injection, USP or 5% Dextrose Injection, USP to prepare a diluted solution with a final concentration ranging from 1 mg/mL to 2 mg/mL. Mix diluted solution by gentle inversion.
- Store the diluted solution for no more than 24 hours under refrigeration (2°C to 8°C, 36°F to 46°F) or at room temperature (20°C to 25°C, 68°F to 77°F).
- Discard partially used vials or empty vials of YERVOY.

### Administration Instructions

- Do not mix YERVOY with, or administer as an infusion with, other medicinal products.
- Flush the intravenous line with 0.9% Sodium Chloride Injection, USP or 5% Dextrose Injection, USP after each dose.
- Administer diluted solution over 90 minutes through an intravenous line containing a sterile, non-pyrogenic, low-protein-binding in-line filter.

When administered in combination with nivolumab, infuse nivolumab first followed by YERVOY on the same day. When administered with nivolumab and platinum-doublet chemotherapy, infuse

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nivolumab first followed by YERVOY and then platinum-doublet chemotherapy on the same day. Use separate infusion bags and filters for each infusion.

# 3 DOSAGE FORMS AND STRENGTHS

Injection: 50 mg/10 mL (5 mg/mL) and 200 mg/40 mL (5 mg/mL) as a clear to slightly opalescent, colorless to pale-yellow solution in a single-use vial.

# 4 CONTRAINDICATIONS

None.

# 5 WARNINGS AND PRECAUTIONS

YERVOY can result in severe and fatal immune-mediated reactions *[see Boxed Warning]*.

## 5.1 Immune-Mediated Enterocolitis/Colitis

Immune-mediated enterocolitis, including fatal cases, can occur with YERVOY.

Monitor patients for signs and symptoms of enterocolitis (such as diarrhea, abdominal pain, mucus or blood in stool, with or without fever) and of bowel perforation (such as peritoneal signs and ileus). In symptomatic patients, rule out infectious etiologies and consider endoscopic evaluation for persistent or severe symptoms. Cytomegalovirus (CMV) infection/reactivation has been reported in patients with corticosteroid-refractory immune-mediated colitis. In cases of corticosteroid-refractory colitis, consider repeating an infectious workup to exclude alternative etiologies. Addition of an alternative immunosuppressive agent to the corticosteroid therapy, or replacement of the corticosteroid therapy should be considered in corticosteroid-refractory immune-mediated colitis if other causes are excluded.

Permanently discontinue YERVOY in patients with severe enterocolitis and initiate systemic corticosteroids at a dose of 1 to 2 mg/kg/day of prednisone or equivalent. Upon improvement to Grade 1 or less, initiate corticosteroid taper and continue to taper over at least 1 month. In clinical trials, rapid corticosteroid tapering resulted in recurrence or worsening symptoms of enterocolitis in some patients. Consider adding anti-TNF or other immunosuppressant agents for management of immune-mediated enterocolitis unresponsive to systemic corticosteroids within 3 to 5 days or recurring after symptom improvement, if other causes are excluded.

Withhold YERVOY dosing for moderate enterocolitis; administer anti-diarrheal treatment and, if persistent for more than 1 week, initiate systemic corticosteroids at a dose of 0.5 mg/kg/day prednisone or equivalent *[see Dosage and Administration (2.8)]*.

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### *YERVOY as a Single Agent*

#### Metastatic Melanoma

In patients receiving YERVOY 3 mg/kg in MDX010-20, severe, life-threatening, or fatal (diarrhea of 7 or more stools above baseline, fever, ileus, peritoneal signs; Grade 3 to 5) immune-mediated enterocolitis occurred in 34 YERVOY-treated patients (7%), and moderate (diarrhea with up to 6 stools above baseline, abdominal pain, mucus or blood in stool; Grade 2) enterocolitis occurred in 28 YERVOY-treated patients (5%). Across all YERVOY-treated patients (n=511), 5 patients (1%) developed intestinal perforation, 4 patients (0.8%) died as a result of complications, and 26 patients (5%) were hospitalized for severe enterocolitis.

The median time to onset of Grade 3 to 5 enterocolitis was 1.7 months (range: 11 days to 3.1 months) and for Grade 2 enterocolitis was 1.4 months (range: 2 days to 4.3 months).

Twenty-nine patients (85%) with Grade 3 to 5 enterocolitis were treated with high-dose (≥40 mg prednisone equivalent per day) corticosteroids, with a median dose of 80 mg/day of prednisone or equivalent; the median duration of treatment was 16 days (ranging up to 3.2 months) followed by corticosteroid taper. Of the 28 patients with moderate enterocolitis, 46% were not treated with systemic corticosteroids, 29% were treated with <40 mg prednisone or equivalent per day for a median duration of 1.2 months, and 25% were treated with high-dose corticosteroids for a median duration of 10 days prior to corticosteroid taper. Infliximab was administered to 5 (8%) of the 62 patients with moderate, severe, or life-threatening immune-mediated enterocolitis following inadequate response to corticosteroids.

Of the 34 patients with Grade 3 to 5 enterocolitis, 74% experienced complete resolution, 3% experienced improvement to Grade 2 severity, and 24% did not improve. Among the 28 patients with Grade 2 enterocolitis, 79% experienced complete resolution, 11% improved, and 11% did not improve.

#### Adjuvant Treatment of Melanoma

In patients receiving YERVOY 10 mg/kg in CA184-029, Grade 3 to 5 immune-mediated enterocolitis occurred in 76 patients (16%) and Grade 2 enterocolitis occurred in 68 patients (14%). Seven patients (1.5%) developed intestinal perforation and 3 patients (0.6%) died as a result of complications *[see Adverse Reactions (6.1)]*.

The median time to onset for Grade 3 to 4 enterocolitis was 1.1 months (range: 1 day to 33.1 months) and for Grade 2 enterocolitis was 1.1 months (range: 1 day to 20.6 months).

Seventy-one patients (95%) with Grade 3 to 4 enterocolitis were treated with systemic corticosteroids. The median duration of treatment was 4.7 months (ranging up to 52.3 months).

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Of the 68 patients with moderate enterocolitis, 51 patients (75%) were treated with systemic corticosteroids with a median duration of treatment of 3.5 months (ranging up to 52.2 months). Non-corticosteroids immunosuppression, consisting almost exclusively of infliximab, was used to treat 36% of patients with Grade 3 to 4 enterocolitis and 15% of patients with a Grade 2 event.

Of the 75 patients with Grade 3 to 4 immune-mediated enterocolitis, 86% experienced complete resolution, 3% experienced improvement to Grade 1, and 11% did not improve. Among the 68 patients with Grade 2 enterocolitis, 94% experienced complete resolution, 3% experienced improvement to Grade 1, and 3% did not improve.

#### *YERVOY 1 mg/kg administered with nivolumab 3 mg/kg*

Immune-mediated colitis occurred in 10% (52/547) of patients with RCC and 7% (8/119) of patients with CRC. Median time to onset of immune-mediated colitis was 1.7 months (range: 2 days to 19.2 months) in patients with RCC and 2.4 months (range: 22 days to 5.2 months) in patients with CRC.

Immune-mediated colitis led to permanent discontinuation of YERVOY and nivolumab in 3.2% of patients with RCC or CRC (n=666) and withholding of both YERVOY and nivolumab in 3.9% *[see Dosage and Administration (2.8)]*. All patients with colitis required systemic corticosteroids, including 80% who received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 21 days (range: 1 day to 27 months). Approximately 23% of patients with immune-mediated colitis required addition of infliximab to high-dose corticosteroids. Complete resolution occurred in 88% of patients. Two patients with RCC had recurrence of colitis after re-initiation of nivolumab with YERVOY.

#### *YERVOY 3 mg/kg administered with nivolumab 1 mg/kg*

Immune-mediated colitis occurred in 10% (5/49) of patients with HCC. Median time to onset was 2 months (range: 1.1 to 19 months). Immune-mediated colitis led to permanent discontinuation or withholding of treatment in 4.1% and 6% of patients, respectively. Sixty percent (60%) of patients with colitis received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 15 days (range: 9 days to 1.1 months). Complete resolution occurred in 80% of patients. Of the 3 patients in whom YERVOY or nivolumab was withheld for colitis, 2 reinitiated treatment after symptom improvement, and none had recurrence of colitis.

## 5.2 Immune-Mediated Hepatitis

Immune-mediated hepatitis, including fatal cases, can occur with YERVOY.

Monitor liver function tests (hepatic transaminase and bilirubin levels) and assess patients for signs and symptoms of hepatotoxicity before each dose of YERVOY. In patients with hepatotoxicity,



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rule out infectious or malignant causes and increase frequency of liver function test monitoring until resolution.

Permanently discontinue YERVOY in patients with Grade 3 to 4 hepatotoxicity and administer systemic corticosteroids at a dose of 1 to 2 mg/kg/day of prednisone or equivalent. When liver function tests show sustained improvement or return to baseline, initiate corticosteroid tapering and continue to taper over 1 month. Across the clinical development program for YERVOY, mycophenolate treatment has been administered in patients who have persistent severe hepatitis despite high-dose corticosteroids. Withhold YERVOY in patients with Grade 2 hepatotoxicity *[see Dosage and Administration (2.8)]*.

### *YERVOY as a Single Agent*

#### Metastatic Melanoma

In patients receiving YERVOY 3 mg/kg in MDX010-20, severe, life-threatening, or fatal hepatotoxicity (AST or ALT elevations of more than 5 times the upper limit of normal or total bilirubin elevations more than 3 times the upper limit of normal; Grade 3 to 5) occurred in 8 YERVOY-treated patients (2%), with fatal hepatic failure in 0.2% and hospitalization in 0.4% of YERVOY-treated patients. An additional 13 patients (2.5%) experienced moderate hepatotoxicity manifested by liver function test abnormalities (AST or ALT elevations of more than 2.5 times but not more than 5 times the upper limit of normal or total bilirubin elevation of more than 1.5 times but not more than 3 times the upper limit of normal; Grade 2). The underlying pathology was not ascertained in all patients but in some instances included immune-mediated hepatitis. There were insufficient numbers of patients with biopsy-proven hepatitis to characterize the clinical course of this event.

#### Adjuvant Treatment of Melanoma

In patients receiving YERVOY 10 mg/kg in CA184-029, Grade 3 to 4 immune-mediated hepatitis occurred in 51 patients (11%) and moderate Grade 2 immune-mediated hepatitis occurred in 22 patients (5%). Liver biopsy performed in 6 patients with Grade 3 to 4 hepatitis showed evidence of toxic or autoimmune hepatitis. The median time to onset for Grade 3 to 4 hepatitis was 2.0 months (range: 1 day to 4.2 months) and for Grade 2 hepatitis was 1.4 months (range: 13 days to 6.5 months). Of the 51 patients with Grade 3 to 4 immune-mediated hepatitis, 94% experienced complete resolution, 4% experienced improvement to Grade 1, and 2% did not improve. Of the 22 patients with Grade 2 immune-mediated hepatitis, 91% experienced complete resolution and 9% did not improve.

Forty-six patients (90%) with Grade 3 to 4 hepatitis were treated with systemic corticosteroids. The median duration of treatment was 4.4 months (ranging up to 56.1 months). Sixteen patients

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(73%) with moderate hepatitis were treated with systemic corticosteroids. The median duration of treatment was 2.6 months (ranging up to 41.4 months).

Concurrent Administration with Vemurafenib

In a dose-finding trial, Grade 3 increases in transaminases with or without concomitant increases in total bilirubin occurred in 6 of 10 patients who received concurrent YERVOY (3 mg/kg) and vemurafenib (960 mg BID or 720 mg BID).

***YERVOY 1 mg/kg administered with nivolumab 3 mg/kg***

Immune-mediated hepatitis occurred in 7% (38/547) of patients with RCC and 8% (10/119) with CRC. Median time to onset was 2 months (range: 14 days to 26.8 months) in patients with RCC and 2.2 months (range: 22 days to 10.5 months) in patients with CRC.

Immune-mediated hepatitis led to permanent discontinuation of YERVOY and nivolumab in 3.6% of patients with RCC or CRC (n=666) and withholding of both YERVOY and nivolumab in 3.5% *[see Dosage and Administration (2.8)]*. All patients with hepatitis required systemic corticosteroids, including 94% who received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 1 month (range: 1 day to 7 months). Approximately 19% of patients with immune-mediated hepatitis required addition of mycophenolic acid to high-dose corticosteroids. Complete resolution occurred in 83% of patients. No patients had recurrence of hepatitis after re-initiation of nivolumab with YERVOY or nivolumab alone.

***YERVOY 3 mg/kg administered with nivolumab 1 mg/kg***

Immune-mediated hepatitis occurred in 20% (10/49) of patients with HCC. Median time to onset was 1.3 months (range: 22 days to 4.1 months). Immune-mediated hepatitis led to permanent discontinuation or withholding of treatment in 6.1% and 14.3% of patients, respectively. Seventy percent (70%) of patients with hepatitis received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 14 days (range: 3 days to 34 months). Complete resolution occurred in 70% of patients. Of the 7 patients in whom YERVOY or nivolumab was withheld for hepatitis, 4 reinitiated treatment after symptom improvement, and none had recurrence of hepatitis.

## 5.3 Immune-Mediated Dermatitis/Skin Adverse Reactions

Immune-mediated dermatitis, including fatal cases, can occur with YERVOY.

Monitor patients for signs and symptoms of dermatitis, such as rash and pruritus. Unless an alternate etiology has been identified, signs or symptoms of dermatitis should be considered immune-mediated.

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Permanently discontinue YERVOY in patients with Stevens-Johnson syndrome, toxic epidermal necrolysis, or rash complicated by full thickness dermal ulceration, or necrotic, bullous, or hemorrhagic manifestations. Administer systemic corticosteroids at a dose of 1 to 2 mg/kg/day of prednisone or equivalent. When dermatitis is controlled, corticosteroid tapering should occur over a period of at least 1 month. Withhold YERVOY dosing in patients with moderate to severe signs and symptoms *[see Dosage and Administration (2.8)]*.

For mild to moderate dermatitis, such as localized rash and pruritus, treat symptomatically. Administer topical or systemic corticosteroids if there is no improvement of symptoms within 1 week.

### *YERVOY as a Single Agent*

#### Metastatic Melanoma

In patients receiving YERVOY 3 mg/kg in MDX010-20, severe, life-threatening, or fatal immune-mediated dermatitis (e.g., Stevens-Johnson syndrome, toxic epidermal necrolysis, or rash complicated by full thickness dermal ulceration, or necrotic, bullous, or hemorrhagic manifestations; Grade 3 to 5) occurred in 13 YERVOY-treated patients (2.5%). One patient (0.2%) died as a result of toxic epidermal necrolysis and one additional patient required hospitalization for severe dermatitis. There were 63 patients (12%) with moderate (Grade 2) dermatitis.

The median time to onset of moderate, severe, or life-threatening immune-mediated dermatitis was 22 days and ranged up to 4.0 months from the initiation of YERVOY.

Seven YERVOY-treated patients (54%) with severe dermatitis received high-dose corticosteroids (median dose 60 mg prednisone/day or equivalent) for up to 3.4 months followed by corticosteroid taper. Of these 7 patients, 6 had complete resolution; time to resolution ranged up to 3.6 months.

Of the 63 patients with moderate dermatitis, 25 (40%) were treated with systemic corticosteroids (median of 60 mg/day of prednisone or equivalent) for a median of 15 days, 7 (11%) were treated with only topical corticosteroids, and 31 (49%) did not receive systemic or topical corticosteroids. Forty-four patients (70%) with moderate dermatitis were reported to have complete resolution, 7 (11%) improved to mild (Grade 1) severity, and 12 (19%) had no reported improvement.

#### Adjuvant Treatment of Melanoma

In patients receiving YERVOY 10 mg/kg in CA184-029, Grade 3 to 4 immune-mediated dermatitis occurred in 19 patients (4%). There were 99 patients (21%) with moderate (Grade 2) dermatitis. The median time to onset for Grade 3 to 4 dermatitis was 14 days (range: 5 days to 11.3 months) and for Grade 2 dermatitis was 11 days (range: 1 day to 16.6 months).

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Sixteen patients (84%) with Grade 3 to 4 dermatitis were treated with systemic corticosteroids for a median of 21 days (ranging up to 49.2 months) resulting in complete resolution of dermatitis within a median time of 4.3 months (range up to 44.4 months). Of the 3 patients (16%) not treated with systemic or topical corticosteroids, 2 (11%) had complete resolution and 1 had improvement to Grade 1.

Of the 99 patients with Grade 2 dermatitis, 67 (68%) were treated with systemic corticosteroids for a median of 2.6 months, 16 (16%) were treated with only topical corticosteroids and 16 (16%) did not receive systemic or topical corticosteroids. Seventy-seven patients (78%) had complete resolution, 15 (15%) improved to mild (Grade 1) severity, and 7 (7%) did not improve.

#### *YERVOY 1 mg/kg administered with nivolumab 3 mg/kg*

Immune-mediated rash occurred in 16% (90/547) of patients with RCC and 14% (17/119) of patients with CRC. Median time to onset was 1.5 months (range: 1 day to 20.9 months) in RCC and 26 days (range: 5 days to 9.8 months) in CRC.

Immune-mediated rash led to permanent discontinuation or withholding of YERVOY and nivolumab in 0.5% of patients with RCC or CRC (n=666) and withholding of YERVOY and nivolumab in 2.6% of patients *[see Dosage and Administration (2.8)]*. All patients with immune-mediated rash required systemic corticosteroids, including 19% who received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 22 days (range: 1 day to 23 months). Complete resolution occurred in 66% of patients. Immune-mediated rash recurred in approximately 3% (3/98) of patients who resumed nivolumab.

#### *YERVOY 3 mg/kg administered with nivolumab 1 mg/kg*

Immune-mediated rash occurred in 35% (17/49) of patients with HCC. Median time to onset was 15 days (range: 6 days to 3.1 months). Immune-mediated rash led to withholding of treatment in 6.1% of patients. Twelve percent (12%) of patients with rash received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 8 days (range: 1 to 15 days). Complete resolution occurred in 65% of patients. Of the 3 patients in whom YERVOY or nivolumab was withheld for rash, 1 reinitiated treatment after symptom improvement, and none had recurrence of rash.

## 5.4 Immune-Mediated Neuropathies

Immune-mediated neuropathies, including fatal cases, can occur with YERVOY.

Monitor for symptoms of motor or sensory neuropathy such as unilateral or bilateral weakness, sensory alterations, or paresthesia. Permanently discontinue YERVOY in patients with severe neuropathy (interfering with daily activities) such as Guillain-Barré-like syndromes. Institute medical intervention as appropriate for management of severe neuropathy. Consider initiation of

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systemic corticosteroids at a dose of 1 to 2 mg/kg/day prednisone or equivalent for severe neuropathies. Withhold YERVOY dosing in patients with moderate neuropathy (not interfering with daily activities) *[see Dosage and Administration (2.8)]*.

***YERVOY as a Single Agent***

Metastatic Melanoma

In patients receiving YERVOY 3 mg/kg in MDX010-20, 1 case of fatal Guillain-Barré syndrome and 1 case of severe (Grade 3) peripheral motor neuropathy were reported. Across the clinical development program of YERVOY, myasthenia gravis and additional cases of Guillain-Barré syndrome have been reported.

Adjuvant Treatment of Melanoma

In patients receiving YERVOY 10 mg/kg in CA184-029, Grade 3 to 5 immune-mediated neuropathy occurred in 8 patients (2%); the sole fatality was due to complications of Guillain-Barré syndrome *[see Adverse Reactions (6.1)]*. Moderate Grade 2 immune-mediated neuropathy occurred in 1 patient (0.2%).

The time to onset across the 9 patients with Grade 2 to 5 immune-mediated neuropathy ranged from 1.4 to 27.4 months. All 8 patients with Grade 3 to 5 neuropathy were treated with systemic corticosteroids (range: 3 days to 38.3 months) and 3 also received tacrolimus. Four of the 8 patients with Grade 3 to 5 immune-mediated neuropathy experienced complete resolution, 1 improved to Grade 1, and 3 did not improve. The single patient with Grade 2 immune-mediated neuropathy experienced complete resolution without the use of corticosteroids.

***YERVOY 1 mg/kg administered with nivolumab 3 mg/kg***

Among 547 RCC patients, there were 3 cases of Grade 3 paresthesia/hypoesthesia.

## 5.5 Immune-Mediated Endocrinopathies

Immune-mediated endocrinopathies, including life-threatening cases, can occur with YERVOY.

Monitor patients for clinical signs and symptoms of hypophysitis, adrenal insufficiency (including adrenal crisis), and hyper- or hypothyroidism. Patients may present with fatigue, headache, mental status changes, abdominal pain, unusual bowel habits, and hypotension, or nonspecific symptoms which may resemble other causes such as brain metastasis or underlying disease. Unless an alternate etiology has been identified, signs or symptoms of endocrinopathies should be considered immune-mediated.

Monitor clinical chemistries, adrenocorticotropic hormone (ACTH) level, and thyroid function tests at the start of treatment, before each dose, and as clinically indicated based on symptoms. In

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a limited number of patients, hypophysitis was diagnosed by imaging studies through enlargement of the pituitary gland.

Withhold YERVOY dosing in symptomatic patients and consider referral to an endocrinologist. Initiate systemic corticosteroids at a dose of 1 to 2 mg/kg/day of prednisone or equivalent, and initiate appropriate hormone replacement therapy *[see Dosage and Administration (2.8)]*.

### *YERVOY as a Single Agent*

#### Metastatic Melanoma

In patients receiving YERVOY 3 mg/kg in MDX010-20, severe to life-threatening immune-mediated endocrinopathies (requiring hospitalization, urgent medical intervention, or interfering with activities of daily living; Grade 3 to 4) occurred in 9 YERVOY-treated patients (1.8%). All 9 patients had hypopituitarism and some had additional concomitant endocrinopathies such as adrenal insufficiency, hypogonadism, and hypothyroidism. Six of the 9 patients were hospitalized for severe endocrinopathies. Moderate endocrinopathy (requiring hormone replacement or medical intervention; Grade 2) occurred in 12 patients (2.3%) and consisted of hypothyroidism, adrenal insufficiency, hypopituitarism, and 1 case each of hyperthyroidism and Cushing's syndrome. The median time to onset of moderate to severe immune-mediated endocrinopathy was 2.5 months and ranged up to 4.4 months after the initiation of YERVOY.

Of the 21 patients with moderate to life-threatening endocrinopathy, 17 patients required long-term hormone replacement therapy including, most commonly, adrenal hormones (n=10) and thyroid hormones (n=13).

#### Adjuvant Treatment of Melanoma

In patients receiving YERVOY 10 mg/kg in CA184-029, Grade 3 to 4 immune-mediated endocrinopathies occurred in 39 patients (8%) and Grade 2 immune-mediated endocrinopathies in 93 patients (20%). Of the 39 patients with Grade 3 to 4 immune-mediated endocrinopathies, 35 patients had hypopituitarism (associated with one or more secondary endocrinopathies, e.g., adrenal insufficiency, hypogonadism, and hypothyroidism), 3 patients had hyperthyroidism, and 1 had primary hypothyroidism. The median time to onset of Grade 3 to 4 immune-mediated endocrinopathy was 2.2 months (range: 2 days to 8 months). Twenty-seven of the 39 patients (69%) were hospitalized for immune-mediated endocrinopathies, and 4 patients (10%) were reported to have resolution.

Of the 93 patients with Grade 2 immune-mediated endocrinopathy, 74 had primary hypopituitarism (associated with one or more secondary endocrinopathy, e.g., adrenal insufficiency, hypogonadism, and hypothyroidism), 9 had primary hypothyroidism, 3 had hyperthyroidism, 3 had thyroiditis with hypo- or hyperthyroidism, 2 had hypogonadism, 1 had

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both hyperthyroidism and hypopituitarism, and 1 subject developed Graves' ophthalmopathy. The median time to onset of Grade 2 immune-mediated endocrinopathy was 2.1 months (range: 9 days to 19.3 months), and 20% were reported to have resolution.

One hundred twenty-four patients received systemic corticosteroids as immunosuppression and/or adrenal hormone replacement for Grade 2 to 4 immune-mediated endocrinopathy. Of these, 42 (34%) were able to discontinue corticosteroids. Seventy-three patients received thyroid hormones for treatment of Grade 2 to 4 immune-mediated hypothyroidism. Of these, 14 patients (19%) were able to discontinue thyroid replacement therapy.

### *YERVOY 1 mg/kg administered with nivolumab 3 mg/kg*

**Hypophysitis.** Hypophysitis occurred in 4.6% (25/547) of patients with RCC and 3.4% (4/119) of patients with CRC. Median time to onset was 2.8 months (range: 1.3 months to 7.3 months) in patients with RCC and 3.7 months (range: 2.8 to 5.5 months) in patients with CRC.

Hypophysitis led to permanent discontinuation or withholding of YERVOY and nivolumab in 1.2% and 2.6% of patients with RCC or CRC (n=666), respectively *[see Dosage and Administration (2.8)]*. Approximately 72% of patients with hypophysitis received hormone replacement therapy and 55% received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 13 days (range: 1 day to 1.6 months).

**Adrenal Insufficiency.** Adrenal insufficiency occurred in 7% (41/547) of patients with RCC and 5.9% (7/119) patients with CRC. Median time to onset was 3.4 months (range: 2.0 months to 22.3 months) in RCC and 3.7 months (range: 2.5 to 13.4 months) in CRC.

Adrenal insufficiency led to permanent discontinuation of YERVOY and nivolumab in 1.2% of patients with RCC or CRC (n=666) and withholding of YERVOY and nivolumab in 2.6% *[see Dosage and Administration (2.8)]*. Approximately 94% of patients with adrenal insufficiency received hormone replacement therapy and 27% received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 12 days (range: 2 days to 5.6 months).

**Hypothyroidism and Hyperthyroidism.** Hypothyroidism or thyroiditis resulting in hypothyroidism occurred in 22% (119/547) of patients with RCC and 15% (18/119) of patients with CRC. Median time to onset was 2.2 months (range: 1 day to 21.4 months) in patients with RCC and 2.3 months (range: 22 days to 9.8 months) in patients with CRC. Of the 137 patients with RCC or CRC who developed hypothyroidism, approximately 81% of patients with RCC and 78% with CRC received levothyroxine.

Hyperthyroidism occurred in 12% (66/547) of patients with RCC and 12% (14/119) of patients with CRC. Median time to onset was 1.4 months (range: 6 days to 14.2 months) in RCC and 1.1 months (range: 21 days to 5.4 months) in CRC. Of the 80 patients with RCC or CRC who

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developed hyperthyroidism, approximately 15% received methimazole and 2% received carbimazole.

**Type 1 Diabetes Mellitus.** Diabetes occurred in 2.7% (15/547) of patients with RCC. Median time to onset was 3.2 months (range: 19 days to 16.8 months). Both YERVOY and nivolumab were withheld in 33% of patients and both were permanently discontinued in 20% of patients who developed diabetes *[see Dosage and Administration (2.8)]*.

### *YERVOY 3 mg/kg administered with nivolumab 1 mg/kg*

**Hypophysitis.** Hypophysitis occurred in 4% (2/49) of patients with HCC. Median time to onset was 3.7 months (range: 3 to 4.3 months). Hypophysitis led to withholding of treatment in 2% of patients. One patient with hypophysitis received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for 6 days.

**Adrenal Insufficiency.** Adrenal insufficiency occurred in 18% (9/49) of patients with HCC. Median time to onset was 2.8 months (range: 1.4 to 8 months). Adrenal insufficiency led to withholding of treatment in 4% of patients. One patient with adrenal insufficiency received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for 1.2 months. Complete resolution occurred in 22% of patients.

**Hypothyroidism.** Hypothyroidism or thyroiditis resulting in hypothyroidism occurred in 22% (11/49) of patients with HCC. Median time to onset was 3.3 months (range: 1.4 to 16.2 months). Complete resolution occurred in 46% of patients.

**Hyperthyroidism.** Hyperthyroidism occurred in 10% (5/49) of patients with HCC. Median time to onset was 1.4 months (range: 1.4 to 2.8 months). Complete resolution occurred in 80% of patients.

## 5.6 Immune-Mediated Pneumonitis

Immune-mediated pneumonitis, including fatal cases, can occur with nivolumab with YERVOY. Monitor patients for signs with radiographic imaging and for symptoms of pneumonitis. Administer corticosteroids at a dose of 1 to 2 mg/kg/day prednisone equivalents for moderate (Grade 2) or more severe (Grade 3-4) pneumonitis, followed by corticosteroid taper. Withhold YERVOY dosing in patients with moderate to severe signs and symptoms. Permanently discontinue YERVOY for life-threatening (Grade 4) pneumonitis *[see Dosage and Administration (2.8)]*.

### *YERVOY 1 mg/kg administered with nivolumab 3 mg/kg*

Immune-mediated pneumonitis occurred in 4.4% (24/547) of patients with RCC and 1.7% (2/119) of patients with CRC. Median time to onset of immune-mediated pneumonitis was 2.6 months

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(range: 8 days to 9.2 months) in patients with RCC and 1.9 months (range: 27 days to 3 months) in patients with CRC.

Immune-mediated pneumonitis led to permanent discontinuation of YERVOY and nivolumab in 1.8% of patients with RCC or CRC (n=666) and withholding of YERVOY and nivolumab in 1.7% *[see Dosage and Administration (2.8)]*. All patients with pneumonitis required systemic corticosteroids, including 92% who received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 19 days (range: 4 days to 3.2 months). Approximately 8% required addition of infliximab to high-dose corticosteroids. Complete resolution of pneumonitis occurred in 81% of patients.

In NSCLC, immune-mediated pneumonitis occurred in 9% (50/576) of patients receiving YERVOY 1 mg/kg every 6 weeks with nivolumab 3 mg/kg every 2 weeks, including Grade 4 (0.5%), Grade 3 (3.5%), and Grade 2 (4.0%) immune-mediated pneumonitis. Four patients (0.7%) died due to pneumonitis. The median duration was 1.5 months (range: 5 days to 25+ months). Immune-mediated pneumonitis led to permanent discontinuation of YERVOY with nivolumab in 5% of patients and withholding of YERVOY with nivolumab in 3.6% of patients.

Systemic corticosteroids were required in 100% of patients with pneumonitis followed by a corticosteroid taper. Pneumonitis resolved in 72% of the patients. Approximately 13% (2/16) of patients had recurrence of pneumonitis after re-initiation of YERVOY with nivolumab.

The incidence and severity of immune-mediated pneumonitis in patients with NSCLC treated with YERVOY 1 mg/kg every 6 weeks in combination with nivolumab 360 mg every 3 weeks and 2 cycles of platinum-doublet chemotherapy were comparable to treatment with YERVOY in combination with nivolumab only.

***YERVOY 3 mg/kg administered with nivolumab 1 mg/kg***

Immune-mediated pneumonitis occurred in 10% (5/49) of patients with HCC. Median time to onset was 8.3 months (range: 1.2 to 17.5 months). Immune-mediated pneumonitis led to permanent discontinuation or withholding of treatment in 6.1% and 4.1% of patients, respectively. All patients with pneumonitis received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 23 days (range: 12 days to 1.4 months). Complete resolution occurred in 60% of patients. Of the 2 patients in whom YERVOY or nivolumab was withheld for pneumonitis, 1 reinitiated treatment after symptom improvement, and none had recurrence of pneumonitis.

## 5.7 Immune-Mediated Nephritis and Renal Dysfunction

Immune-mediated nephritis can occur with nivolumab with YERVOY. Monitor patients for elevated serum creatinine prior to and periodically during treatment. Administer corticosteroids at

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a dose of 1 to 2 mg/kg/day prednisone equivalents followed by corticosteroid taper for life-threatening (Grade 4) increased serum creatinine. Administer corticosteroids at a dose of 0.5 to 1 mg/kg/day prednisone equivalents for moderate (Grade 2) or severe (Grade 3) increased serum creatinine, if worsening or no improvement occurs, increase dose of corticosteroids to 1 to 2 mg/kg/day prednisone equivalents. Withhold YERVOY dosing in patients with moderate to severe signs and symptoms. Permanently discontinue YERVOY for life-threatening (Grade 4) increased serum creatinine *[see Dosage and Administration (2.8)]*.

#### *YERVOY 1 mg/kg administered with nivolumab 3 mg/kg*

Immune-mediated nephritis and renal dysfunction occurred in 4.6% (25/547) of patients with RCC and 1.7% (2/119) of patients with CRC. Median time to onset was 3 months (range: 1 day to 13.2 months) among these 27 patients.

Immune-mediated nephritis and renal dysfunction led to permanent discontinuation of YERVOY and nivolumab in 1.2% of patients with RCC or CRC (n=666) and withholding of nivolumab and YERVOY in 2.3% of patients with RCC or CRC *[see Dosage and Administration (2.8)]*. Approximately 78% of patients with immune-mediated nephritis and renal dysfunction received high-dose corticosteroids (at least 40 mg prednisone equivalents per day) for a median duration of 17 days (range: 1 day to 6 months). Complete resolution occurred in 63% of patients.

### 5.8 Immune-Mediated Encephalitis

Immune-mediated encephalitis can occur with YERVOY. Evaluation of patients with neurologic symptoms may include, but not be limited to, consultation with a neurologist, brain MRI, and lumbar puncture.

Withhold YERVOY in patients with new-onset moderate to severe neurologic signs or symptoms and evaluate to rule out infectious or other causes of moderate to severe neurologic deterioration. If other etiologies are ruled out, administer corticosteroids at a dose of 1 to 2 mg/kg/day prednisone equivalents for patients with immune-mediated encephalitis, followed by corticosteroid taper. Permanently discontinue YERVOY for immune-mediated encephalitis *[see Dosage and Administration (2.8)]*.

#### *YERVOY 1 mg/kg administered with nivolumab 3 mg/kg*

Encephalitis occurred in one patient (0.2%) with RCC approximately 4 months after initiation of YERVOY and in one patient (0.8%) with CRC 15 days after initiation of YERVOY. The patient with CRC required infliximab and high-dose corticosteroids (at least 40 mg prednisone equivalents per day).

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## 5.9 Infusion-Related Reactions

Severe infusion-related reactions can occur with nivolumab with YERVOY. Discontinue YERVOY in patients with severe or life-threatening infusion-related reactions. Interrupt or slow the rate of infusion in patients with mild or moderate infusion-related reactions *[see Dosage and Administration (2.8)]*.

### *YERVOY 1 mg/kg administered with nivolumab 3 mg/kg*

Infusion-related reactions occurred in 5.1% (28/547) of patients with RCC and 4.2% (5/119) of patients with CRC.

### *YERVOY 3 mg/kg administered with nivolumab 1 mg/kg*

Infusion-related reactions occurred in 8% (4/49) of patients with HCC.

## 5.10 Other Immune-Mediated Adverse Reactions

### *YERVOY as a Single Agent*

Permanently discontinue YERVOY for clinically significant or severe immune-mediated adverse reactions. Initiate systemic corticosteroids at a dose of 1 to 2 mg/kg/day prednisone or equivalent for severe immune-mediated adverse reactions.

Monitor patients for signs or symptoms of ocular toxicity, which may include blurred vision and reduced visual acuity. Immune-mediated ocular toxicity may be associated with retinal detachment or permanent vision loss. Administer corticosteroid eye drops to patients who develop uveitis, iritis, or episcleritis. Permanently discontinue YERVOY for immune-mediated ocular disease that is unresponsive to local immunosuppressive therapy *[see Dosage and Administration (2.8)]*. If uveitis occurs in combination with other immune-mediated adverse reactions, consider a Vogt-Koyanagi-Harada-like syndrome, which has been observed in patients receiving YERVOY and may require treatment with systemic steroids to reduce the risk of permanent vision loss.

Fatal or serious graft-versus-host disease (GVHD) can occur in patients who receive a CTLA-4 receptor blocking antibody either before or after allogeneic hematopoietic stem cell transplantation (HSCT). Follow patients closely for evidence of GVHD and intervene promptly. *[See Adverse Reactions (6.3).]* Consider the benefit versus risks of treatment with a CTLA-4 receptor blocking antibody after allogeneic HSCT.

#### Metastatic Melanoma

In MDX010-20, the following clinically significant immune-mediated adverse reactions were seen in less than 1% of YERVOY-treated patients: cytopenias, nephritis, pneumonitis, meningitis, pericarditis, uveitis, and iritis.

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### Adjuvant Treatment of Melanoma

In CA184-029, the following clinically significant immune-mediated adverse reactions were seen in less than 1% of YERVOY-treated patients unless specified: cytopenias, eosinophilia (2.1%), pancreatitis (1.3%), meningitis, pneumonitis, sarcoidosis, pericarditis, uveitis, and fatal myocarditis *[see Adverse Reactions (6.1)]*.

### Other Clinical Experience

Across 21 dose-ranging trials administering YERVOY at doses of 0.1 to 20 mg/kg (n=2478), the following likely immune-mediated adverse reactions were also reported with less than 1% incidence unless specified: angiopathy, temporal arteritis, vasculitis, polymyalgia rheumatica, conjunctivitis, blepharitis, episcleritis, scleritis, iritis, leukocytoclastic vasculitis, erythema multiforme, psoriasis, arthritis, autoimmune thyroiditis, neurosensory hypoacusis, autoimmune central neuropathy (encephalitis), myositis, polymyositis, ocular myositis, cytopenias (2.5%), and nephritis.

#### *YERVOY in Combination with Nivolumab*

YERVOY can cause other clinically significant and potentially fatal immune-mediated adverse reactions. Immune-mediated adverse reactions may occur after discontinuation of YERVOY therapy. For any suspected immune-mediated adverse reactions, exclude other causes. Based on the severity of the adverse reaction, permanently discontinue or withhold YERVOY, administer high-dose corticosteroids, and if appropriate, initiate hormone-replacement therapy. Upon improvement to Grade 1 or less, initiate corticosteroid taper and continue to taper over at least 1 month. Consider restarting YERVOY after completion of corticosteroid taper based on the severity of the event.

Across clinical trials of YERVOY administered with nivolumab or in trials of nivolumab administered as a single agent, the following clinically significant immune-mediated adverse reactions, some with fatal outcome, occurred in less than 1.0% of patients: myocarditis, rhabdomyolysis, myositis, uveitis, iritis, pancreatitis, facial and abducens nerve paresis, demyelination, polymyalgia rheumatica, autoimmune neuropathy, Guillain-Barré syndrome, hypopituitarism, systemic inflammatory response syndrome, gastritis, duodenitis, sarcoidosis, histiocytic necrotizing lymphadenitis (Kikuchi lymphadenitis), motor dysfunction, vasculitis, aplastic anemia, pericarditis, and myasthenic syndrome.

## 5.11 Embryo-Fetal Toxicity

Based on its mechanism of action and data from animal studies, YERVOY can cause fetal harm when administered to a pregnant woman. In animal reproduction studies, administration of ipilimumab to cynomolgus monkeys from the onset of organogenesis through delivery resulted in

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higher incidences of abortion, stillbirth, premature delivery (with corresponding lower birth weight), and higher incidences of infant mortality in a dose-related manner. The effects of ipilimumab are likely to be greater during the second and third trimesters of pregnancy. Advise pregnant women of the potential risk to a fetus. Advise females of reproductive potential to use effective contraception during treatment with a YERVOY-containing regimen and for 3 months after the last dose of YERVOY *[see Use in Specific Populations (8.1, 8.3)]*.

### 5.12 Risks Associated When Administered in Combination with Nivolumab

When YERVOY is administered in combination with nivolumab, refer to the nivolumab prescribing information for additional risk information that applies to the combination use.

## 6 ADVERSE REACTIONS

The following adverse reactions are discussed in greater detail in other sections of the labeling.

- Immune-mediated enterocolitis/colitis *[see Warnings and Precautions (5.1)]*.
- Immune-mediated hepatitis *[see Warnings and Precautions (5.2)]*.
- Immune-mediated dermatitis/skin adverse reactions *[see Warnings and Precautions (5.3)]*.
- Immune-mediated neuropathies *[see Warnings and Precautions (5.4)]*.
- Immune-mediated endocrinopathies *[see Warnings and Precautions (5.5)]*.
- Immune-mediated pneumonitis *[see Warnings and Precautions (5.6)]*.
- Immune-mediated nephritis and renal dysfunction *[see Warnings and Precautions (5.7)]*.
- Immune-mediated encephalitis *[see Warnings and Precautions (5.8)]*.
- Infusion reactions *[see Warnings and Precautions (5.9)]*.
- Other immune-mediated adverse reactions *[see Warnings and Precautions (5.10)]*.
- Embryo-fetal toxicity *[see Warnings and Precautions (5.11)]*.

In patients receiving YERVOY 3 mg/kg for unresectable or metastatic melanoma in MDX010-20, 15% of patients receiving monotherapy and 12% of patients treated in combination with gp100 peptide vaccine experienced Grade 3 to 5 immune-mediated reactions. In patients receiving YERVOY 10 mg/kg for adjuvant treatment of melanoma in CA184-029, 41% experienced Grade 3 to 5 immune-mediated reactions.

### 6.1 Clinical Trials Experience

Because clinical trials are conducted under widely varying conditions, the adverse reaction rates observed cannot be directly compared with rates in other clinical trials or experience with therapeutics in the same class and may not reflect the rates observed in clinical practice.

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The data described below reflect exposure to YERVOY 3 mg/kg as a single agent in MDX010-20, a randomized trial in patients with unresectable or metastatic melanoma; to YERVOY 10 mg/kg as a single agent in CA184-029, a randomized trial in patients with resected Stage IIIA (>1 mm nodal involvement), IIIB, and IIIC (with no in-transit metastases) cutaneous melanoma; to YERVOY 1 mg/kg, administered in combination with nivolumab, in three trials: CHECKMATE-214, a randomized trial in previously untreated patients with advanced renal cell carcinoma, CHECKMATE-142, an open-label, multicenter, non-randomized multiple parallel cohort trial in patients with previously treated, MSI-H or dMMR metastatic colorectal cancer, and CHECKMATE-227, a randomized, multicenter, multi-cohort, open-label trial in patients with previously untreated metastatic or recurrent non-small cell lung cancer with no EGFR or ALK genomic tumor aberrations; and to YERVOY 3 mg/kg, administered in combination with nivolumab, in CHECKMATE-040, a multicenter, multiple cohort, open-label trial conducted in patients with hepatocellular carcinoma who progressed on or were intolerant to sorafenib; and to YERVOY 1 mg/kg, administered in combination with nivolumab and platinum-doublet chemotherapy in CHECKMATE-9LA, an open-label, multicenter, randomized trial in adult patients with previously untreated metastatic or recurrent non-small cell lung cancer with no EGFR or ALK genomic tumor aberrations.

Clinically significant adverse reactions were evaluated in a total of 982 patients treated in MDX010-20 and CA184-029 and in 21 dose-ranging trials (n=2478) administering YERVOY at doses of 0.1 to 20 mg/kg *[see Warnings and Precautions (5.6)]*.

### Unresectable or Metastatic Melanoma

The safety of YERVOY was evaluated in MDX010-20, a randomized, double-blind clinical trial in which 643 previously treated patients with unresectable or metastatic melanoma received YERVOY 3 mg/kg for 4 doses given by intravenous infusion as a single agent (n=131), YERVOY with an investigational gp100 peptide vaccine (gp100) (n=380), or gp100 peptide vaccine as a single agent (n=132) *[see Clinical Studies (14.1)]*. Patients in the trial received a median of 4 doses (range: 1 to 4 doses).

MDX010-20 excluded patients with active autoimmune disease or those receiving systemic immunosuppression for organ transplantation.

The trial population characteristics were: median age 57 years (range: 19 to 90), 59% male, 94% white, and baseline ECOG performance status 0 (56%).

YERVOY was discontinued for adverse reactions in 10% of patients.

Table 2 presents selected adverse reactions from MDX010-20, which occurred in at least 5% of patients in the YERVOY-containing arms and with at least 5% increased incidence over the control

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gp100 arm for all-grade events and at least 1% incidence over the control group for Grade 3 to 5 events.

**Table 2: Selected Adverse Reactions in MDX010-20**

| | Percentage (%) of Patients[a] | | | | | |
|---|---|---|---|---|---|---|
| | YERVOY 3 mg/kg n=131 | | YERVOY 3 mg/kg+gp100 n=380 | | gp100 n=132 | |
| **System Organ Class/ Preferred Term** | Any Grade | Grade 3 to 5 | Any Grade | Grade 3 to 5 | Any Grade | Grade 3 to 5 |
| **General Disorders and Administration-Site Conditions** | | | | | | |
| Fatigue | 41 | 7 | 34 | 5 | 31 | 3 |
| **Gastrointestinal Disorders** | | | | | | |
| Diarrhea | 32 | 5 | 37 | 4 | 20 | 1 |
| Colitis | 8 | 5 | 5 | 3 | 2 | 0 |
| **Skin and Subcutaneous Tissue Disorders** | | | | | | |
| Pruritus | 31 | 0 | 21 | <1 | 11 | 0 |
| Rash | 29 | 2 | 25 | 2 | 8 | 0 |

[a] Incidences presented in this table are based on reports of adverse events regardless of causality.

Table 3 presents the per-patient incidence of severe, life-threatening, or fatal immune-mediated adverse reactions from MDX010-20.

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**Table 3: Severe to Fatal Immune-Mediated Adverse Reactions in MDX010-20**

| | Percentage (%) of Patients | |
|---|---|---|
| | YERVOY 3 mg/kg n=131 | YERVOY 3 mg/kg+gp100 n=380 |
| **Any Immune-Mediated Adverse Reaction** | 15 | 12 |
| **Enterocolitis[a,b]** | 7 | 7 |
| **Hepatotoxicity[a]** | 1 | 2 |
| **Dermatitis[a]** | 2 | 3 |
| **Neuropathy[a]** | 1 | <1 |
| **Endocrinopathy** | 4 | 1 |
| Hypopituitarism | 4 | 1 |
| Adrenal insufficiency | 0 | 1 |
| **Other** | | |
| Pneumonitis | 0 | <1 |
| Meningitis | 0 | <1 |
| Nephritis | 1 | 0 |
| Eosinophilia[c] | 1 | 0 |
| Pericarditis[a,c] | 0 | <1 |

[a] Including fatal outcome.
[b] Including intestinal perforation.
[c] Underlying etiology not established.

### Adjuvant Treatment of Melanoma

The safety of YERVOY was evaluated in CA184-029, a randomized (1:1), double-blind, placebo-controlled trial in which 945 patients with resected Stage IIIA (>1 mm nodal involvement), IIIB, and IIIC (with no in-transit metastases) cutaneous melanoma received YERVOY 10 mg/kg (n=471) or placebo (n=474) administered as an intravenous infusion for 4 doses every 3 weeks followed by 10 mg/kg every 12 weeks beginning at Week 24 up to a maximum of 3 years *[see Clinical Studies (14.2)]*. In this trial, 36% of patients received YERVOY for longer than 6 months and 26% of patients received YERVOY for longer than 1 year. YERVOY-treated patients in the trial received a median of 4 doses (range: 1 to 16).

CA184-029 excluded patients with prior systemic therapy for melanoma, autoimmune disease, a condition requiring systemic immunosuppression, or a positive test for hepatitis B, hepatitis C, or HIV.

The trial population characteristics were: median age 51 years (range: 18 to 84 years), 62% male, 99% white, and baseline ECOG performance status 0 (94%).

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YERVOY was discontinued for adverse reactions in 52% of patients.

Table 4 presents selected adverse reactions from CA184-029 which occurred in at least 5% of YERVOY-treated patients and with at least 5% increased incidence over the placebo group for all-grade events.

**Table 4: Selected Adverse Reactions in CA184-029**

| | Percentage (%) of Patients[a] | | | |
|---|---|---|---|---|
| | YERVOY 10 mg/kg n=471 | | Placebo n=474 | |
| **System Organ Class/ Preferred Term** | Any Grade | Grade 3 to 5 | Any Grade | Grade 3 to 5 |
| **Skin and Subcutaneous Tissue Disorders** | | | | |
| Rash | 50 | 2.1 | 20 | 0 |
| Pruritus | 45 | 2.3 | 15 | 0 |
| **Gastrointestinal Disorders** | | | | |
| Diarrhea | 49 | 10 | 30 | 2.1 |
| Nausea | 25 | 0.2 | 18 | 0 |
| Colitis[b] | 16 | 8 | 1.5 | 0.4 |
| Vomiting | 13 | 0.4 | 6 | 0.2 |
| **Investigations** | | | | |
| Weight Decreased | 32 | 0.2 | 9 | 0.4 |
| **General Disorders and Administration-Site Conditions** | | | | |
| Fatigue | 46 | 2.3 | 38 | 1.5 |
| Pyrexia | 18 | 1.1 | 4.9 | 0.2 |
| **Nervous System Disorders** | | | | |
| Headache | 33 | 0.8 | 18 | 0.2 |
| **Metabolism and Nutrition Disorders** | | | | |
| Decreased Appetite | 14 | 0.2 | 3.4 | 0.2 |
| **Psychiatric Disorders** | | | | |
| Insomnia | 10 | 0 | 4.4 | 0 |

[a] Incidences presented in this table are based on reports of adverse events regardless of causality.
[b] Includes 1 death.

Table 5 presents selected laboratory abnormalities from CA184-029 which occurred in at least 10% of YERVOY-treated patients at a higher incidence compared to placebo.

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**Table 5: Laboratory Abnormalities Worsening from Baseline Occurring in ≥10% of YERVOY-Treated Patients (CA184-029)[a]**

| | Percentage of Patients with Worsening Laboratory Test from Baseline[a] | | | |
|---|---|---|---|---|
| | YERVOY | | Placebo | |
| **Test** | All Grades | Grade 3 to 4 | All Grades | Grade 3 to 4 |
| **Chemistry** | | | | |
| Increased ALT | 46 | 10 | 16 | 0 |
| Increased AST | 38 | 9 | 14 | 0.2 |
| Increased lipase[b] | 26 | 9 | 17 | 4.5 |
| Increased amylase[b] | 17 | 2.0 | 7 | 0.6 |
| Increased alkaline phosphatase | 17 | 0.6 | 6 | 0.2 |
| Increased bilirubin | 11 | 1.5 | 9 | 0 |
| Increased creatinine | 10 | 0.2 | 6 | 0 |
| **Hematology** | | | | |
| Decreased hemoglobin | 25 | 0.2 | 14 | 0 |

[a] Each test incidence is based on the number of patients who had both baseline and at least one on-study laboratory measurement available. Excluding lipase and amylase, YERVOY group (range: 466 to 470 patients) and placebo group (range: 472 to 474 patients).

[b] For lipase and amylase, YERVOY group (range: 447 to 448 patients) and placebo group (range: 462 to 464 patients).

Table 6 presents the per-patient incidence of severe, life-threatening, or fatal immune-mediated adverse reactions from CA184-029.

**Table 6: Severe to Fatal Immune-Mediated Adverse Reactions in CA184-029**

| | Percentage (%) of Patients |
|---|---|
| | YERVOY<br>10 mg/kg<br>n=471 |
| **Any Immune-Mediated Adverse Reaction** | 41 |
| **Enterocolitis[a,b]** | 16 |
| **Hepatitis** | 11 |
| **Dermatitis** | 4.0 |
| **Neuropathy[a]** | 1.7 |
| **Endocrinopathy** | 8 |
| Hypopituitarism | 7 |
| Primary hypothyroidism | 0.2 |
| Hyperthyroidism | 0.6 |

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**Table 6: Severe to Fatal Immune-Mediated Adverse Reactions in CA184-029**

| | Percentage (%) of Patients |
|---|---|
| | YERVOY 10 mg/kg n=471 |
| **Other** | |
| Myocarditis[a] | 0.2 |
| Meningitis | 0.4 |
| Pericarditis[c] | 0.2 |
| Pneumonitis | 0.2 |
| Uveitis | 0.2 |

[a] Including fatal outcome.
[b] Including intestinal perforation.
[c] Underlying etiology not established.

### Other Clinical Experience

Across clinical studies that utilized YERVOY doses ranging from 0.3 to 10 mg/kg, the following adverse reactions were also reported (incidence less than 1% unless otherwise noted): urticaria (2%), large intestinal ulcer, esophagitis, acute respiratory distress syndrome, renal failure, and infusion reaction.

### Previously Untreated Renal Cell Carcinoma

The safety of nivolumab 3 mg/kg, administered with YERVOY 1 mg/kg was evaluated in CHECKMATE-214, a randomized open-label trial in which 1082 patients with previously untreated advanced RCC received nivolumab 3 mg/kg in combination with YERVOY 1 mg/kg every 3 weeks for 4 doses followed by nivolumab monotherapy at the 3 mg/kg dose (n=547) every 2 weeks or sunitinib administered orally 50 mg daily for 4 weeks followed by 2 weeks off, every cycle (n=535) *[see Clinical Studies (14.3)]*. The median duration of treatment was 7.9 months (range: 1 day to 21.4+ months) in nivolumab plus YERVOY-treated patients and 7.8 months (range: 1 day to 20.2+ months) in sunitinib-treated patients. In this trial, 57% of patients in the nivolumab plus YERVOY arm were exposed to treatment for greater than 6 months, and 38% of patients were exposed to treatment for greater than 1 year.

Study therapy was discontinued for adverse reactions in 31% of nivolumab plus YERVOY patients and in 21% of sunitinib patients. Fifty-four percent (54%) of patients receiving nivolumab plus YERVOY and 43% of patients receiving sunitinib had a drug delay for an adverse reaction. In the sunitinib group, 53% of patients required a dose reduction; dose reductions were not permitted in the nivolumab plus YERVOY treatment group. Serious adverse reactions occurred in 59% of patients receiving nivolumab plus YERVOY and in 43% of patients receiving sunitinib. The most

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frequent serious adverse reactions reported in at least 2% of patients treated with nivolumab plus YERVOY were diarrhea, pyrexia, pneumonia, pneumonitis, hypophysitis, acute kidney injury, dyspnea, adrenal insufficiency, and colitis; in patients treated with sunitinib, they were pneumonia, pleural effusion, and dyspnea.

The most common adverse reactions (reported in at least 20% of nivolumab plus YERVOY-treated patients) were fatigue, rash, diarrhea, musculoskeletal pain, pruritus, nausea, cough, pyrexia, arthralgia, vomiting, dyspnea, and decreased appetite. Table 7 summarizes adverse reactions that occurred in greater than 15% of nivolumab plus YERVOY-treated patients.

**Table 7: Grade 1-4 Adverse Reactions in >15% of Patients Receiving Nivolumab plus YERVOY (CHECKMATE-214)**

| | Nivolumab plus YERVOY (n=547) | | Sunitinib (n=535) | |
|---|---|---|---|---|
| | Percentage (%) of Patients | | | |
| | Grades 1-4 | Grades 3-4 | Grades 1-4 | Grades 3-4 |
| **Adverse Reaction** | 99 | 65 | 99 | 76 |
| **General Disorders and Administration Site Conditions** | | | | |
| Fatigue[a] | 58 | 8 | 69 | 13 |
| Pyrexia | 25 | 0.7 | 17 | 0.6 |
| Edema[b] | 16 | 0.5 | 17 | 0.6 |
| **Respiratory, Thoracic, and Mediastinal Disorders** | | | | |
| Cough/productive cough | 28 | 0.2 | 25 | 0.4 |
| Dyspnea/exertional dyspnea | 20 | 2.4 | 21 | 2.1 |
| **Gastrointestinal Disorders** | | | | |
| Diarrhea | 38 | 4.6 | 58 | 6 |
| Nausea | 30 | 2.0 | 43 | 1.5 |
| Vomiting | 20 | 0.9 | 28 | 2.1 |
| Abdominal pain | 19 | 1.6 | 24 | 1.9 |
| Constipation | 17 | 0.4 | 18 | 0 |
| **Skin and Subcutaneous Tissue Disorders** | | | | |
| Rash[c] | 39 | 3.7 | 25 | 1.1 |
| Pruritus/generalized pruritus | 33 | 0.5 | 11 | 0 |
| **Endocrine Disorders** | | | | |
| Hypothyroidism | 18 | 0.4 | 27 | 0.2 |
| **Nervous System Disorders** | | | | |
| Headache | 19 | 0.9 | 23 | 0.9 |
| **Metabolism and Nutrition Disorders** | | | | |
| Decreased appetite | 21 | 1.8 | 29 | 0.9 |
| **Musculoskeletal and Connective Tissue Disorders** | | | | |
| Musculoskeletal pain[d] | 37 | 4.0 | 40 | 2.6 |

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**Table 7: Grade 1-4 Adverse Reactions in >15% of Patients Receiving Nivolumab plus YERVOY (CHECKMATE-214)**

| | Nivolumab plus YERVOY (n=547) | | Sunitinib (n=535) | |
|---|---|---|---|---|
| | Percentage (%) of Patients | | | |
| | Grades 1-4 | Grades 3-4 | Grades 1-4 | Grades 3-4 |
| Arthralgia | 23 | 1.3 | 16 | 0 |

Toxicity was graded per NCI CTCAE v4.

[a] Includes asthenia.

[b] Includes peripheral edema, peripheral swelling.

[c] Includes dermatitis described as acneiform, bullous, and exfoliative, drug eruption, rash described as exfoliative, erythematous, follicular, generalized, macular, maculopapular, papular, pruritic, and pustular, fixed-drug eruption.

[d] Includes back pain, bone pain, musculoskeletal chest pain, musculoskeletal discomfort, myalgia, neck pain, pain in extremity, spinal pain.

The most common laboratory abnormalities which have worsened compared to baseline in ≥30% of nivolumab plus YERVOY-treated patients include increased lipase, anemia, increased creatinine, increased ALT, increased AST, hyponatremia, increased amylase, and lymphopenia. Table 8 summarizes the laboratory abnormalities that occurred in greater than 15% of nivolumab plus YERVOY-treated patients.

**Table 8: Grade 1-4 Laboratory Values Worsening from Baseline Occurring in >15% of Patients on Nivolumab plus YERVOY (CHECKMATE-214)**

| Laboratory Abnormality | Percentage of Patients with Worsening Laboratory Test from Baseline[a] | | | |
|---|---|---|---|---|
| | Nivolumab plus YERVOY | | Sunitinib | |
| | Grades 1-4 | Grades 3-4 | Grades 1-4 | Grades 3-4 |
| **Hematology** | | | | |
| Anemia | 43 | 3.0 | 64 | 9 |
| Lymphopenia | 36 | 5 | 63 | 14 |
| **Chemistry** | | | | |
| Increased lipase | 48 | 20 | 51 | 20 |
| Increased creatinine | 42 | 2.1 | 46 | 1.7 |
| Increased ALT | 41 | 7 | 44 | 2.7 |
| Increased AST | 40 | 4.8 | 60 | 2.1 |
| Increased amylase | 39 | 12 | 33 | 7 |
| Hyponatremia | 39 | 10 | 36 | 7 |
| Increased alkaline phosphatase | 29 | 2.0 | 32 | 1.0 |
| Hyperkalemia | 29 | 2.4 | 28 | 2.9 |
| Hypocalcemia | 21 | 0.4 | 35 | 0.6 |
| Hypomagnesemia | 16 | 0.4 | 26 | 1.6 |

[a] Each test incidence is based on the number of patients who had both baseline and at least one on-study laboratory measurement available: nivolumab plus YERVOY group (range: 490 to 538 patients) and sunitinib group (range: 485 to 523 patients).

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In addition, among patients with TSH less than or equal to the ULN at baseline, a lower proportion of patients experienced a treatment-emergent elevation of TSH greater than the ULN in the nivolumab plus YERVOY group compared to the sunitinib group (31% and 61%, respectively).

### Previously Treated MSI-H or dMMR Metastatic Colorectal Cancer

The safety of YERVOY was evaluated in CHECKMATE-142, an open-label, multicenter, non-randomized, multiple parallel-cohort study. In CHECKMATE-142, 119 patients with previously treated MSI-H or dMMR mCRC received YERVOY, in combination with nivolumab, in a single-arm cohort. All patients had received prior fluorouracil-based chemotherapy for metastatic disease; 69% had received prior treatment with a fluoropyrimidine, oxaliplatin, and irinotecan; and 29% had received an anti-EGFR antibody.

Patients received YERVOY 1 mg/kg and nivolumab 3 mg/kg on Day 1 of each 21-day cycle for 4 doses, then nivolumab 3 mg/kg every 2 weeks until disease progression or unacceptable toxicity. *[See Clinical Studies (14.4)]*.

The median duration of exposure for YERVOY was 2.1 months. Serious adverse reactions occurred in 47% of YERVOY-treated patients. The most frequent serious adverse reactions reported in at least 2% of patients were colitis/diarrhea, hepatic events, abdominal pain, acute kidney injury, pyrexia, and dehydration. The most common adverse reactions (reported in at least 20% of YERVOY-treated patients) were fatigue, diarrhea, pyrexia, musculoskeletal pain, abdominal pain, pruritus, nausea, rash, decreased appetite, and vomiting.

Table 9 summarizes adverse reactions that occurred in greater than 10% of patients receiving YERVOY. Table 10 summarizes laboratory tests that worsened from baseline in greater than 10% of patients receiving YERVOY.

**Table 9: Adverse Reactions Occurring in ≥10% of Patients (CHECKMATE-142)**

| | **YERVOY plus Nivolumab MSI-H/dMMR Cohort (n=119)** | |
|---|---|---|
| | **Percentage (%) of Patients** | |
| **Adverse Reaction** | **All Grades** | **Grades 3-4** |
| **General Disorders and Administration Site Conditions** | | |
| Fatigue[a] | 49 | 6 |
| Pyrexia | 36 | 0 |
| Edema[b] | 7 | 0 |
| **Gastrointestinal Disorders** | | |
| Diarrhea | 45 | 3.4 |
| Abdominal pain[c] | 30 | 5 |

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**Table 9: Adverse Reactions Occurring in ≥10% of Patients (CHECKMATE-142)**

| | YERVOY plus Nivolumab MSI-H/dMMR Cohort (n=119) | |
|---|---|---|
| | Percentage (%) of Patients | |
| **Adverse Reaction** | **All Grades** | **Grades 3-4** |
| Nausea | 26 | 0.8 |
| Vomiting | 20 | 1.7 |
| Constipation | 15 | 0 |
| **Musculoskeletal and Connective Tissue Disorders** | | |
| Musculoskeletal pain[d] | 36 | 3.4 |
| Arthralgia | 14 | 0.8 |
| **Skin and Subcutaneous Tissue Disorders** | | |
| Pruritus | 28 | 1.7 |
| Rash[e] | 25 | 4.2 |
| Dry Skin | 11 | 0 |
| **Infections and Infestations** | | |
| Upper respiratory tract infection[f] | 9 | 0 |
| **Metabolism and Nutrition Disorders** | | |
| Decreased appetite | 20 | 1.7 |
| **Respiratory, Thoracic, and Mediastinal Disorders** | | |
| Cough | 19 | 0.8 |
| Dyspnea | 13 | 1.7 |
| **Nervous System Disorders** | | |
| Headache | 17 | 1.7 |
| Dizziness | 11 | 0 |
| **Endocrine Disorders** | | |
| Hyperglycemia | 6 | 1 |
| Hypothyroidism | 14 | 0.8 |
| Hyperthyroidism | 12 | 0 |
| **Investigations** | | |
| Weight decreased | 10 | 0 |
| **Psychiatric Disorders** | | |
| Insomnia | 13 | 0.8 |

Toxicity was graded per NCI CTCAE v4.

[a] Includes asthenia.

[b] Includes peripheral edema and peripheral swelling.

[c] Includes upper abdominal pain, lower abdominal pain, and abdominal discomfort.

[d] Includes back pain, pain in extremity, myalgia, neck pain, and bone pain.

[e] Includes dermatitis, dermatitis acneiform, and rash described as maculo-papular, erythematous, and generalized.

[f] Includes nasopharyngitis and rhinitis.

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Other clinically important adverse reactions reported in less than 10% of patients receiving YERVOY in CHECKMATE-142 were encephalitis (0.8%), necrotizing myositis (0.8%), and uveitis (0.8%).

**Table 10: Laboratory Abnormalities Worsening from Baseline Occurring in ≥10% of Patients (CHECKMATE-142)**

| Laboratory Abnormality | Percentage of Patients with Worsening Laboratory Test from Baseline[a] | |
|---|---|---|
| | YERVOY plus Nivolumab MSI-H/dMMR Cohort (n=119) | |
| | All Grades | Grades 3-4 |
| **Hematology** | | |
| Anemia | 42 | 9 |
| Thrombocytopenia | 26 | 0.9 |
| Lymphopenia | 25 | 6 |
| Neutropenia | 18 | 0 |
| **Chemistry** | | |
| Increased AST | 40 | 12 |
| Increased lipase | 39 | 12 |
| Increased amylase | 36 | 3.4 |
| Increased ALT | 33 | 12 |
| Increased alkaline phosphatase | 28 | 5 |
| Hyponatremia | 26 | 5 |
| Increased creatinine | 25 | 3.6 |
| Hyperkalemia | 23 | 0.9 |
| Increased bilirubin | 21 | 5 |
| Hypomagnesemia | 18 | 0 |
| Hypocalcemia | 16 | 0 |
| Hypokalemia | 15 | 1.8 |

[a] Each test incidence is based on the number of patients who had both baseline and at least one on-study laboratory measurement available. Number of evaluable patients ranges from 87 to 114 for nivolumab with YERVOY and from 62 to 71 for nivolumab.

### Hepatocellular Carcinoma

The safety of YERVOY 3 mg/kg in combination with nivolumab 1 mg/kg was evaluated in a subgroup of 49 patients with HCC and Child-Pugh Class A cirrhosis who progressed on or were intolerant to sorafenib enrolled in Cohort 4 of CHECKMATE-040. YERVOY and nivolumab were administered every 3 weeks for four doses, followed by single-agent nivolumab 240 mg every 2 weeks until disease progression or unacceptable toxicity.

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During the YERVOY and nivolumab combination period, 33 of 49 (67%) patients received all four planned doses of YERVOY and nivolumab. During the entire treatment period, the median duration of exposure to YERVOY was 2.1 months (range: 0 to 4.5 months) and to nivolumab was 5.1 months (range: 0 to 35+ months). Forty-seven percent of patients were exposed to treatment for >6 months, and 35% of patients were exposed to treatment for >1 year. Serious adverse reactions occurred in 59% of patients. Treatment was discontinued in 29% of patients and delayed in 65% of patients for an adverse reaction.

Serious adverse reactions reported in ≥4% of patients were pyrexia, diarrhea, anemia, increased AST, adrenal insufficiency, ascites, esophageal varices hemorrhage, hyponatremia, increased blood bilirubin, and pneumonitis.

Table 11 summarizes the adverse reactions and Table 12 summarizes the laboratory abnormalities of YERVOY in combination with nivolumab in CHECKMATE-040.

**Table 11: Adverse Reactions Occurring in ≥10% of Patients Receiving YERVOY in Combination with Nivolumab in Cohort 4 of CHECKMATE-040**

| Adverse Reaction | YERVOY and Nivolumab (n=49) | |
|---|---|---|
| | All Grades (%) | Grades 3-4 (%) |
| **Skin and Subcutaneous Tissue** | | |
| Rash | 53 | 8 |
| Pruritus | 53 | 4 |
| **Musculoskeletal and Connective Tissue** | | |
| Musculoskeletal pain | 41 | 2 |
| Arthralgia | 10 | 0 |
| **Gastrointestinal** | | |
| Diarrhea | 39 | 4 |
| Abdominal pain | 22 | 6 |
| Nausea | 20 | 0 |
| Ascites | 14 | 6 |
| Constipation | 14 | 0 |
| Dry mouth | 12 | 0 |
| Dyspepsia | 12 | 2 |
| Vomiting | 12 | 2 |
| Stomatitis | 10 | 0 |
| **Respiratory, Thoracic and Mediastinal** | | |
| Cough | 37 | 0 |
| Dyspnea | 14 | 0 |
| Pneumonitis | 10 | 2 |
| **Metabolism and Nutrition** | | |
| Decreased appetite | 35 | 2 |
| **General** | | |
| Fatigue | 27 | 2 |
| Pyrexia | 27 | 0 |
| Malaise | 18 | 2 |
| Edema | 16 | 2 |
| Influenza-like illness | 14 | 0 |
| Chills | 10 | 0 |

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**Table 11: Adverse Reactions Occurring in ≥10% of Patients Receiving YERVOY in Combination with Nivolumab in Cohort 4 of CHECKMATE-040**

| Adverse Reaction | YERVOY and Nivolumab (n=49) | |
|---|---|---|
| | All Grades (%) | Grades 3-4 (%) |
| **Nervous System** | | |
| Headache | 22 | 0 |
| Dizziness | 20 | 0 |
| **Endocrine** | | |
| Hypothyroidism | 20 | 0 |
| Adrenal insufficiency | 18 | 4 |
| **Investigations** | | |
| Weight decreased | 20 | 0 |
| **Psychiatric** | | |
| Insomnia | 18 | 0 |
| **Blood and Lymphatic System** | | |
| Anemia | 10 | 4 |
| **Infections** | | |
| Influenza | 10 | 2 |
| **Vascular** | | |
| Hypotension | 10 | 0 |

Clinically important adverse reactions reported in <10% of patients receiving YERVOY with nivolumab were hyperglycemia (8%), colitis (4%), and increased blood creatine phosphokinase (2%).

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**Table 12: Select Laboratory Abnormalities (≥10%) Worsening from Baseline in Patients Receiving YERVOY in Combination with Nivolumab in Cohort 4 of CHECKMATE-040**

| Laboratory Abnormality | YERVOY and Nivolumab (n=47) | |
|---|---|---|
| | All Grades (%) | Grades 3-4 (%) |
| **Hematology** | | |
| Lymphopenia | 53 | 13 |
| Anemia | 43 | 4.3 |
| Neutropenia | 43 | 9 |
| Leukopenia | 40 | 2.1 |
| Thrombocytopenia | 34 | 4.3 |
| **Chemistry** | | |
| Increased AST | 66 | 40 |
| Increased ALT | 66 | 21 |
| Increased bilirubin | 55 | 11 |
| Increased lipase | 51 | 26 |
| Hyponatremia | 49 | 32 |
| Hypocalcemia | 47 | 0 |
| Increased alkaline phosphatase | 40 | 4.3 |
| Increased amylase | 38 | 15 |
| Hypokalemia | 26 | 2.1 |
| Hyperkalemia | 23 | 4.3 |
| Increased creatinine | 21 | 0 |
| Hypomagnesemia | 11 | 0 |

In patients who received YERVOY with nivolumab, virologic breakthrough occurred in 4 of 28 (14%) patients and 2 of 4 (50%) patients with active HBV or HCV at baseline, respectively. HBV virologic breakthrough was defined as at least a 1 log increase in HBV DNA for those patients with detectable HBV DNA at baseline. HCV virologic breakthrough was defined as a 1 log increase in HCV RNA from baseline.

### First-line Treatment of Metastatic NSCLC: In Combination with Nivolumab

The safety of YERVOY in combination with nivolumab was evaluated in CHECKMATE-227, a randomized, multicenter, multi-cohort, open-label trial in patients with previously untreated metastatic or recurrent NSCLC with no EGFR or ALK genomic tumor aberrations *[see Clinical Studies (14.6)]*. The trial excluded patients with untreated brain metastases, carcinomatous meningitis, active autoimmune disease, or medical conditions requiring systemic immunosuppression. Patients received YERVOY 1 mg/kg by intravenous infusion over 30 minutes every 6 weeks and nivolumab 3 mg/kg by intravenous infusion over 30 minutes every 2 weeks or platinum-doublet chemotherapy every 3 weeks for 4 cycles. The median duration of therapy in YERVOY and nivolumab-treated patients was 4.2 months (range: 1 day to 25.5 months): 39% of patients received YERVOY and nivolumab for >6 months and 23% of patients received YERVOY and nivolumab for >1 year. The population characteristics were: median age 64 years (range: 26 to 87); 48% were ≥65 years of age, 76% White, and 67% male. Baseline ECOG performance status was 0 (35%) or 1 (65%), 85% were former/current smokers, 11% had brain metastases, 28% had squamous histology and 72% had non-squamous histology.

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Serious adverse reactions occurred in 58% of patients. YERVOY and nivolumab were discontinued for adverse reactions in 24% of patients and 53% had at least one dose withheld for an adverse reaction.

The most frequent (≥2%) serious adverse reactions were pneumonia, diarrhea/colitis, pneumonitis, hepatitis, pulmonary embolism, adrenal insufficiency, and hypophysitis. Fatal adverse reactions occurred in 1.7% of patients; these included events of pneumonitis (4 patients), myocarditis, acute kidney injury, shock, hyperglycemia, multi-system organ failure, and renal failure. The most common (≥20%) adverse reactions were fatigue, rash, decreased appetite, musculoskeletal pain, diarrhea/colitis, dyspnea, cough, hepatitis, nausea, and pruritus.

Tables 13 and 14 summarize selected adverse reactions and laboratory abnormalities, respectively, in CHECKMATE-227.

**Table 13: Adverse Reactions in ≥10% of Patients Receiving YERVOY and Nivolumab - CHECKMATE-227**

| Adverse Reaction | YERVOY and Nivolumab (n=576) | | Platinum-doublet Chemotherapy (n=570) | |
|---|---|---|---|---|
| | All Grades (%) | Grades 3-4 (%) | All Grades (%) | Grades 3-4 (%) |
| **General** | | | | |
| Fatigue[a] | 44 | 6 | 42 | 4.4 |
| Pyrexia | 18 | 0.5 | 11 | 0.4 |
| Edema[b] | 14 | 0.2 | 12 | 0.5 |
| **Skin and Subcutaneous Tissue** | | | | |
| Rash[c] | 34 | 4.7 | 10 | 0.4 |
| Pruritus[d] | 21 | 0.5 | 3.3 | 0 |
| **Metabolism and Nutrition** | | | | |
| Decreased appetite | 31 | 2.3 | 26 | 1.4 |
| **Musculoskeletal and Connective Tissue** | | | | |
| Musculoskeletal pain[e] | 27 | 1.9 | 16 | 0.7 |
| Arthralgia | 13 | 0.9 | 2.5 | 0.2 |
| **Gastrointestinal** | | | | |
| Diarrhea/colitis[f] | 26 | 3.6 | 16 | 0.9 |
| Nausea | 21 | 1.0 | 42 | 2.5 |
| Constipation | 18 | 0.3 | 27 | 0.5 |
| Vomiting | 13 | 1.0 | 18 | 2.3 |

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**Table 13: Adverse Reactions in ≥10% of Patients Receiving YERVOY and Nivolumab - CHECKMATE-227**

| Adverse Reaction | YERVOY and Nivolumab (n=576) | | Platinum-doublet Chemotherapy (n=570) | |
|---|---|---|---|---|
| | All Grades (%) | Grades 3-4 (%) | All Grades (%) | Grades 3-4 (%) |
| Abdominal pain[g] | 10 | 0.2 | 9 | 0.7 |
| **Respiratory, Thoracic, and Mediastinal** | | | | |
| Dyspnea[h] | 26 | 4.3 | 16 | 2.1 |
| Cough[i] | 23 | 0.2 | 13 | 0 |
| **Hepatobiliary** | | | | |
| Hepatitis[j] | 21 | 9 | 10 | 1.2 |
| **Endocrine** | | | | |
| Hypothyroidism[k] | 16 | 0.5 | 1.2 | 0 |
| Hyperthyroidism[l] | 10 | 0 | 0.5 | 0 |
| **Infections and Infestations** | | | | |
| Pneumonia[m] | 13 | 7 | 8 | 4.0 |
| **Nervous System** | | | | |
| Headache | 11 | 0.5 | 6 | 0 |

[a] Includes fatigue and asthenia.
[b] Includes eyelid edema, face edema, generalized edema, localized edema, edema, edema peripheral, and periorbital edema.
[c] Includes autoimmune dermatitis, dermatitis, dermatitis acneiform, dermatitis allergic, dermatitis atopic, dermatitis bullous, dermatitis contact, dermatitis exfoliative, dermatitis psoriasiform, granulomatous dermatitis, rash generalized, drug eruption, dyshidrotic eczema, eczema, exfoliative rash, nodular rash, rash, rash erythematous, rash generalized, rash macular, rash maculo-papular, rash papular, rash pruritic, rash pustular, toxic skin eruption.
[d] Includes pruritus and pruritus generalized.
[e] Includes back pain, bone pain, musculoskeletal chest pain, musculoskeletal discomfort, musculoskeletal pain, myalgia, and pain in extremity.
[f] Includes colitis, colitis microscopic, colitis ulcerative, diarrhea, enteritis infectious, enterocolitis, enterocolitis infectious, and enterocolitis viral.
[g] Includes abdominal discomfort, abdominal pain, abdominal pain lower, abdominal pain upper, and abdominal tenderness.
[h] Includes dyspnea and dyspnea exertional.
[i] Includes cough and productive cough.
[j] Includes alanine aminotransferase increased, aspartate aminotransferase increased, autoimmune hepatitis, blood bilirubin increased, hepatic enzyme increased, hepatic failure, hepatic function abnormal, hepatitis, hepatitis E, hepatocellular injury, hepatotoxicity, hyperbilirubinemia, immune-mediated hepatitis, liver function test abnormal, liver function test increased, transaminases increased.
[k] Includes autoimmune thyroiditis, blood thyroid stimulating hormone increased, hypothyroidism, primary hypothyroidism, thyroiditis, and tri-iodothyronine free decreased.
[l] Contains blood thyroid stimulating hormone decreased, hyperthyroidism, and tri-iodothyronine free increased.

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[m] Includes lower respiratory tract infection, lower respiratory tract infection bacterial, lung infection, pneumonia, pneumonia adenoviral, pneumonia aspiration, pneumonia bacterial, pneumonia klebsiella, pneumonia influenzal, pneumonia viral, atypical pneumonia, organizing pneumonia.

Other clinically important adverse reactions in CHECKMATE-227 were:

*Skin and Subcutaneous Tissue:* urticaria, alopecia, erythema multiforme, vitiligo

*Gastrointestinal:* stomatitis, pancreatitis, gastritis

*Musculoskeletal and Connective Tissue:* arthritis, polymyalgia rheumatica, rhabdomyolysis

*Nervous System:* peripheral neuropathy, autoimmune encephalitis

*Blood and Lymphatic System:* eosinophilia

*Eye Disorders:* blurred vision, uveitis

*Cardiac:* atrial fibrillation, myocarditis

**Table 14: Laboratory Values Worsening from Baseline[a] Occurring in ≥20% of Patients on YERVOY and Nivolumab - CHECKMATE-227**

| Laboratory Abnormality | YERVOY and Nivolumab | | Platinum-doublet Chemotherapy | |
|---|---|---|---|---|
| | Grades 1-4 (%) | Grades 3-4 (%) | Grades 1-4 (%) | Grades 3-4 (%) |
| **Hematology** | | | | |
| Anemia | 46 | 3.6 | 78 | 14 |
| Lymphopenia | 46 | 5 | 60 | 15 |
| **Chemistry** | | | | |
| Hyponatremia | 41 | 12 | 26 | 4.9 |
| Increased AST | 39 | 5 | 26 | 0.4 |
| Increased ALT | 36 | 7 | 27 | 0.7 |
| Increased lipase | 35 | 14 | 14 | 3.4 |
| Increased alkaline phosphatase | 34 | 3.8 | 20 | 0.2 |
| Increased amylase | 28 | 9 | 18 | 1.9 |
| Hypocalcemia | 28 | 1.7 | 17 | 1.3 |
| Hyperkalemia | 27 | 3.4 | 22 | 0.4 |
| Increased creatinine | 22 | 0.9 | 17 | 0.2 |

[a] Each test incidence is based on the number of patients who had both baseline and at least one on-study laboratory measurement available: YERVOY and nivolumab group (range: 494 to 556 patients) and chemotherapy group (range: 469 to 542 patients).

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### First-line Treatment of Metastatic or Recurrent NSCLC: In Combination with Ipilimumab and Platinum-Doublet Chemotherapy

The safety of YERVOY in combination with nivolumab and platinum-doublet chemotherapy was evaluated in CHECKMATE-9LA *[see Clinical Studies (14.6)]*. Patients received either YERVOY 1 mg/kg administered every 6 weeks in combination with nivolumab 360 mg administered every 3 weeks and platinum-doublet chemotherapy administered every 3 weeks for 2 cycles; or platinum-doublet chemotherapy administered every 3 weeks for 4 cycles. The median duration of therapy in YERVOY in combination with nivolumab and platinum-doublet chemotherapy was 6 months (range: 1 day to 19 months): 50% of patients received YERVOY and nivolumab for >6 months and 13% of patients received YERVOY and nivolumab for >1 year.

Serious adverse reactions occurred in 57% of patients who were treated with YERVOY in combination with nivolumab and platinum-doublet chemotherapy. The most frequent (>2%) serious adverse reactions were pneumonia, diarrhea, febrile neutropenia, anemia, acute kidney injury, musculoskeletal pain, dyspnea, pneumonitis, and respiratory failure. Fatal adverse reactions occurred in 7 (2%) patients, and included hepatic toxicity, acute renal failure, sepsis, pneumonitis, diarrhea with hypokalemia, and massive hemoptysis in the setting of thrombocytopenia.

Study therapy with YERVOY in combination with nivolumab and platinum-doublet chemotherapy was permanently discontinued for adverse reactions in 24% of patients and 56% had at least one treatment withheld for an adverse reaction. The most common (>20%) adverse reactions were fatigue, musculoskeletal pain, nausea, diarrhea, rash, decreased appetite, constipation, and pruritus.

Tables 15 and 16 summarize selected adverse reactions and laboratory abnormalities, respectively, in CHECKMATE-9LA.

**Table 15: Adverse Reactions in >10% of Patients Receiving YERVOY and Nivolumab and Platinum-Doublet Chemotherapy - CHECKMATE-9LA**

| Adverse Reaction | YERVOY and Nivolumab and Platinum-Doublet Chemotherapy (n=358) | | Platinum-Doublet Chemotherapy (n=349) | |
|---|---|---|---|---|
| | All Grades (%) | Grades 3-4 (%) | All Grades (%) | Grades 3-4 (%) |
| **General** | | | | |
| Fatigue[a] | 49 | 5 | 40 | 4.9 |
| Pyrexia | 14 | 0.6 | 10 | 0.6 |
| **Musculoskeletal and Connective Tissue** | | | | |
| Musculoskeletal pain[b] | 39 | 4.5 | 27 | 2.0 |
| **Gastrointestinal** | | | | |
| Nausea | 32 | 1.7 | 41 | 0.9 |
| Diarrhea[c] | 31 | 6 | 18 | 1.7 |
| Constipation | 21 | 0.6 | 23 | 0.6 |
| Vomiting | 18 | 2.0 | 17 | 1.4 |

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**Table 15: Adverse Reactions in >10% of Patients Receiving YERVOY and Nivolumab and Platinum-Doublet Chemotherapy - CHECKMATE-9LA**

| Adverse Reaction | YERVOY and Nivolumab and Platinum-Doublet Chemotherapy (n=358) | | Platinum-Doublet Chemotherapy (n=349) | |
|---|---|---|---|---|
| | All Grades (%) | Grades 3-4 (%) | All Grades (%) | Grades 3-4 (%) |
| Abdominal pain[d] | 12 | 0.6 | 11 | 0.9 |
| **Skin and Subcutaneous Tissue** | | | | |
| Rash[e] | 30 | 4.7 | 10 | 0.3 |
| Pruritus[f] | 21 | 0.8 | 2.9 | 0 |
| Alopecia | 11 | 0.8 | 10 | 0.6 |
| **Metabolism and Nutrition** | | | | |
| Decreased appetite | 28 | 2.0 | 22 | 1.7 |
| **Respiratory, Thoracic and Mediastinal** | | | | |
| Cough[g] | 19 | 0.6 | 15 | 0.9 |
| Dyspnea[h] | 18 | 4.7 | 14 | 3.2 |
| **Endocrine** | | | | |
| Hypothyroidism[i] | 19 | 0.3 | 3.4 | 0 |
| **Nervous System** | | | | |
| Headache | 11 | 0.6 | 7 | 0 |
| Dizziness[j] | 11 | 0.6 | 6 | 0 |

Toxicity was graded per NCI CTCAE v4.

[a] Includes fatigue and asthenia

[b] Includes myalgia, back pain, pain in extremity, musculoskeletal pain, bone pain, flank pain, muscle spasms, musculoskeletal chest pain, musculoskeletal disorder, osteitis, musculoskeletal stiffness, non-cardiac chest pain, arthralgia, arthritis, arthropathy, joint effusion, psoriatic arthropathy, synovitis

[c] Includes colitis, ulcerative colitis, diarrhea, and enterocolitis

[d] Includes abdominal discomfort, abdominal pain, lower abdominal pain, upper abdominal pain, and gastrointestinal pain

[e] Includes acne, dermatitis, acneiform dermatitis, allergic dermatitis, atopic dermatitis, bullous dermatitis, generalized exfoliative dermatitis, eczema, keratoderma blenorrhagica, palmar-plantar erythrodysaesthesia syndrome, rash, erythematous rash, generalized rash, macular rash, maculo-papular rash, morbilliform rash, papular rash, pruritic rash, skin exfoliation, skin reaction, skin toxicity, Stevens-Johnson syndrome, urticaria

[f] Includes pruritus and generalized pruritus

[g] Includes cough, productive cough, and upper-airway cough syndrome

[h] Includes dyspnea, dyspnea at rest, and exertional dyspnea

[i] Includes autoimmune thyroiditis, increased blood thyroid stimulating hormone, hypothyroidism, thyroiditis, and decreased free tri-iodothyronine

[j] Includes dizziness, vertigo and positional vertigo

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**Table 16: Laboratory Values Worsening from Baseline[a] Occurring in >20% of Patients on YERVOY and Nivolumab and Platinum-Doublet Chemotherapy - CHECKMATE-9LA**

| Laboratory Abnormality | YERVOY and Nivolumab and Platinum-Doublet Chemotherapy | | Platinum-Doublet Chemotherapy | |
|---|---|---|---|---|
| | Grades 1-4 (%) | Grades 3-4 (%) | Grades 1-4 (%) | Grades 3-4 (%) |
| **Hematology** | | | | |
| Anemia | 70 | 9 | 74 | 16 |
| Lymphopenia | 41 | 6 | 40 | 11 |
| Neutropenia | 40 | 15 | 42 | 15 |
| Leukopenia | 36 | 10 | 40 | 9 |
| Thrombocytopenia | 23 | 4.3 | 24 | 5 |
| **Chemistry** | | | | |
| Hyperglycemia | 45 | 7 | 42 | 2.6 |
| Hyponatremia | 37 | 10 | 27 | 7 |
| Increased ALT | 34 | 4.3 | 24 | 1.2 |
| Increased lipase | 31 | 12 | 10 | 2.2 |
| Increased alkaline phosphatase | 31 | 1.2 | 26 | 0.3 |
| Increased amylase | 30 | 7 | 19 | 1.3 |
| Increased AST | 30 | 3.5 | 22 | 0.3 |
| Hypomagnesemia | 29 | 1.2 | 33 | 0.6 |
| Hypocalcemia | 26 | 1.4 | 22 | 1.8 |
| Increased creatinine | 26 | 1.2 | 23 | 0.6 |
| Hyperkalemia | 22 | 1.7 | 21 | 2.1 |

[a] Each test incidence is based on the number of patients who had both baseline and at least one on-study laboratory measurement available: YERVOY and nivolumab and platinum-doublet chemotherapy group (range: 197 to 347 patients) and platinum-doublet chemotherapy group (range: 191 to 335 patients).

## 6.2 Immunogenicity

As with all therapeutic proteins, there is a potential for immunogenicity. The detection of antibody formation is highly dependent on the sensitivity and specificity of the assay. Additionally, the observed incidence of antibody (including neutralizing antibody) positivity in an assay may be influenced by several factors including assay methodology, sample handling, timing of sample collection, concomitant medications, and underlying disease. For these reasons, comparison of the incidence of antibodies to ipilimumab in the studies described below with the incidences of antibodies in other studies or to other products may be misleading.

Eleven (1.1%) of 1024 evaluable patients with unresectable or metastatic melanoma tested positive for treatment-emergent binding antibodies against ipilimumab (TE-ADAs) in an

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electrochemiluminescent (ECL) based assay. This assay had substantial limitations in detecting anti-ipilimumab antibodies in the presence of ipilimumab. Seven (4.9%) of 144 patients receiving ipilimumab and 7 (4.5%) of 156 patients receiving placebo for the adjuvant treatment of melanoma tested positive for TE-ADAs using an ECL assay with improved drug tolerance. No patients tested positive for neutralizing antibodies. No infusion-related reactions occurred in patients who tested positive for TE-ADAs.

Of 499 patients evaluable for anti-ipilimumab antibodies in CHECKMATE-214 and CHECKMATE-142, 27 (5.4%) were positive for anti-ipilimumab antibodies; there were no patients with neutralizing antibodies against ipilimumab. There was no evidence of increased incidence of infusion reactions to YERVOY in patients with anti-ipilimumab antibodies. Of 503 patients evaluable for anti-nivolumab antibodies in CHECKMATE-214 and CHECKMATE-142 trials, 126 (25%) were positive for anti-nivolumab antibodies and 3 (0.6%) were positive for neutralizing antibodies against nivolumab.

Of 483 patients evaluable for anti-ipilimumab antibodies in CHECKMATE-227 Part 1, 8.5% were positive for treatment-emergent anti-ipilimumab antibodies. No patients had neutralizing antibodies against ipilimumab. In Part 1 of the same study, of 491 patients evaluable for anti-nivolumab antibodies, 36.7% were positive for anti-nivolumab antibodies and 1.4% had neutralizing antibodies against nivolumab.

Of 305 patients evaluable for anti-ipilimumab antibodies in CHECKMATE-9LA, 8% were positive for anti-ipilimumab antibodies and 1.6% were positive for anti-ipilimumab neutralizing antibodies. There was no evidence of increased incidence of infusion reactions to YERVOY in patients with anti-ipilimumab antibodies. Of 308 patients evaluable for anti-nivolumab antibodies in CHECKMATE-9LA, 34% were positive for anti-nivolumab antibodies and 2.6% had neutralizing antibodies against nivolumab.

## 6.3 Postmarketing Experience

The following adverse reactions have been identified during postapproval use of YERVOY. 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:* graft-versus-host disease

*Skin and Subcutaneous Tissue Disorders:* Drug reaction with eosinophilia and systemic symptoms (DRESS syndrome)

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# 7 DRUG INTERACTIONS

No formal pharmacokinetic drug interaction studies have been conducted with YERVOY.

# 8 USE IN SPECIFIC POPULATIONS

## 8.1 Pregnancy

### Risk Summary

Based on data from animal studies and its mechanism of action, YERVOY can cause fetal harm when administered to a pregnant woman *[see Clinical Pharmacology (12.1)]*. In animal reproduction studies, administration of ipilimumab to cynomolgus monkeys from the onset of organogenesis through delivery resulted in higher incidences of abortion, stillbirth, premature delivery (with corresponding lower birth weight), and higher incidences of infant mortality in a dose-related manner *(see Data)*. The effects of ipilimumab are likely to be greater during the second and third trimesters of pregnancy. Human IgG1 is known to cross the placental barrier and ipilimumab is an IgG1; therefore, ipilimumab has the potential to be transmitted from the mother to the developing fetus. There is insufficient human data for YERVOY exposure in pregnant women. Advise pregnant women of the potential risk to a fetus.

In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2% to 4% and 15% to 20%, respectively.

A Pregnancy Safety Surveillance Study has been established to collect information about pregnancies in women who have received YERVOY. Healthcare providers are encouraged to enroll patients or have their patients enroll directly by calling 1-844-593-7869.

### Data

#### *Animal Data*

In a combined study of embryo-fetal and peri-postnatal development, pregnant cynomolgus monkeys received ipilimumab every 3 weeks from the onset of organogenesis in the first trimester through parturition. No treatment-related adverse effects on reproduction were detected during the first two trimesters of pregnancy. Beginning in the third trimester, administration of ipilimumab at doses resulting in exposures approximately 2.6 to 7.2 times the human exposure at a dose of 3 mg/kg resulted in dose-related increases in abortion, stillbirth, premature delivery (with corresponding lower birth weight), and an increased incidence of infant mortality. In addition, developmental abnormalities were identified in the urogenital system of 2 infant monkeys exposed *in utero* to 30 mg/kg of ipilimumab (7.2 times the AUC in humans at the 3 mg/kg dose). One female infant monkey had unilateral renal agenesis of the left kidney and ureter, and 1 male infant

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monkey had an imperforate urethra with associated urinary obstruction and subcutaneous scrotal edema.

Genetically engineered mice heterozygous for CTLA-4 (CTLA-4+/−), the target for ipilimumab, appeared healthy and gave birth to healthy CTLA-4+/− heterozygous offspring. Mated CTLA-4+/− heterozygous mice also produced offspring deficient in CTLA-4 (homozygous negative, CTLA-4−/−). The CTLA-4−/− homozygous negative offspring appeared healthy at birth, exhibited signs of multiorgan lymphoproliferative disease by 2 weeks of age, and all died by 3 to 4 weeks of age with massive lymphoproliferation and multiorgan tissue destruction.

## 8.2 Lactation

### Risk Summary

It is not known whether YERVOY is present in human milk. In monkeys, ipilimumab was present in milk *(see Data)*. There are no data to assess the effects of YERVOY on milk production. Advise women to discontinue breastfeeding during treatment with YERVOY and for 3 months following the final dose.

### Data

In monkeys treated at dose levels resulting in exposures 2.6 and 7.2 times higher than those in humans at a 3 mg/kg dose, ipilimumab was present in milk at concentrations of 0.1 mcg/mL and 0.4 mcg/mL, representing a ratio of up to 0.3% of the steady-state serum concentration of the drug.

## 8.3 Females and Males of Reproductive Potential

### Contraception

Based on its mechanism of action, YERVOY 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 YERVOY and for 3 months following the last dose of YERVOY.

## 8.4 Pediatric Use

The safety and effectiveness of YERVOY have been established in pediatric patients 12 years and older for the treatment of unresectable or metastatic melanoma or for the treatment of microsatellite instability-high (MSI-H) or mismatch repair deficient (dMMR) metastatic colorectal cancer that has progressed following treatment with a fluoropyrimidine, oxaliplatin, and irinotecan. Use of YERVOY in this age group is supported by evidence from adequate and well-controlled studies of YERVOY in adults and population pharmacokinetic data demonstrating that the exposure at doses of 3 mg/kg and 1 mg/kg in the pediatric and adult populations are comparable. In addition,

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the tumor biology and course of advanced melanoma and MSI-H or dMMR metastatic colorectal cancer are sufficiently similar in adults and pediatric patients 12 years and older to allow extrapolation of data from adults to pediatric patients.

The safety and effectiveness for pediatric patients 12 years and older have not been established for the adjuvant treatment of melanoma or for the treatment of renal cell carcinoma. In addition, the safety and effectiveness have not been established with YERVOY for any indication in pediatric patients less than 12 years of age.

YERVOY was evaluated in a total of 45 pediatric patients across two clinical trials. In a dose-finding trial, 33 pediatric patients with relapsed or refractory solid tumors were evaluated. The median age was 13 years (range 2 to 21 years), and 20 patients were ≥12 years old. YERVOY was administered at doses of 1, 3, 5, and 10 mg/kg intravenously over 90 minutes every 3 weeks for 4 doses and then every 12 weeks thereafter until progression or treatment discontinuation.

YERVOY was also evaluated in an open-label, single-arm trial in 12 pediatric patients ≥12 years old (range 12 to 16 years) with previously treated or untreated, unresectable Stage 3 or 4 malignant melanoma. Patients received YERVOY 3 mg/kg (4 patients) or 10 mg/kg (8 patients) intravenously over 90 minutes every 3 weeks for 4 doses.

Of the 17 patients ≥12 years of age with melanoma treated with YERVOY across both studies, two patients experienced objective responses including one partial response that was sustained for 16 months. There were no responses in patients with non-melanoma solid tumors.

The overall safety profile of YERVOY in children and adolescents was consistent with the safety profile in adults.

*Pediatric Pharmacokinetics (PK)*

Based on a population PK analysis using available pooled data from 565 patients from four phase 2 adult studies (N=521) and two pediatric studies (N=44), body weight normalized clearance of ipilimumab is comparable between adult and pediatric patients. In pediatric patients with a dosing regimen of 3 mg/kg every 3 weeks, the model simulated geometric mean (CV%) steady-state serum peak and trough concentrations of ipilimumab were 65.8 (17.6%) and 20.7 (33.1%) mcg/mL (for 2 to 6 years old), 70.1 (19.6%) and 19.6 (42.9%) mcg/mL (for 6 to <12 years old), and 73.3 (20.6%) and 17.8 (50.8%) mcg/mL (for 12 years and older), which are comparable to those in adult patients.

## 8.5 Geriatric Use

Of the 511 patients treated with YERVOY in MDX010-20 (unresectable or metastatic melanoma), 28% were 65 years and over. No overall differences in safety or efficacy were reported between the elderly patients (65 years and over) and younger patients (less than 65 years).

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CA184-029 (adjuvant treatment of melanoma) and CHECKMATE-142 (metastatic colorectal cancer) did not include sufficient numbers of patients aged 65 years and older to determine whether they respond differently from younger patients.

Of the 550 patients randomized to nivolumab 3 mg/kg administered with YERVOY 1 mg/kg in CHECKMATE-214 (renal cell carcinoma), 38% were 65 years or older and 8% were 75 years or older. No overall difference in safety was reported between elderly patients and younger patients. In elderly patients with intermediate or poor risk, no overall difference in effectiveness was reported.

Of the 49 patients who received nivolumab 1 mg/kg administered with YERVOY 3 mg/kg in Cohort 4 of CHECKMATE-040 (hepatocellular carcinoma), 29% were between 65 years and 74 years of age and 8% were 75 years or older. Clinical studies of YERVOY in combination with nivolumab did not include sufficient numbers of patients with hepatocellular carcinoma aged 65 and over to determine whether they respond differently from younger patients.

Of the 576 patients randomized to YERVOY 1 mg/kg every 6 weeks with nivolumab 3 mg/kg every 2 weeks in CHECKMATE-227 (NSCLC), 48% were 65 years or older and 10% were 75 years or older. No overall difference in safety was reported between older patients and younger patients; however, there was a higher discontinuation rate due to adverse reactions in patients aged 75 years or older (29%) relative to all patients who received YERVOY with nivolumab (18%). Of the 396 patients in the primary efficacy population (PD-L1 ≥1%) randomized to YERVOY 1 mg/kg every 6 weeks with nivolumab 3 mg/kg every 2 weeks with in CHECKMATE-227, the hazard ratio for overall survival was 0.70 (95% CI: 0.55, 0.89) in the 199 patients younger than 65 years compared to 0.91 (95% CI: 0.72, 1.15) in the 197 patients 65 years or older *[see Clinical Studies (14.6)]*.

Of the 361 patients randomized to YERVOY 1 mg/kg every 6 weeks in combination with nivolumab 360 mg every 3 weeks and platinum-doublet chemotherapy every 3 weeks (for 2 cycles) in CHECKMATE-9LA (NSCLC), 51% were 65 years or older and 10% were 75 years or older. No overall difference in safety was reported between older patients and younger patients; however, there was a higher discontinuation rate due to adverse reactions in patients aged 75 years or older (43%) relative to all patients who received YERVOY with nivolumab and chemotherapy (24%). For patients aged 75 years or older who received chemotherapy only, the discontinuation rate due to adverse reactions was 16% relative to all patients who had a discontinuation rate of 13%. Based on an updated analysis for overall survival, of the 361 patients randomized to YERVOY in combination with nivolumab and platinum-doublet chemotherapy in CHECKMATE-9LA, the hazard ratio for overall survival was 0.61 (95% CI: 0.47, 0.80) in the 176 patients younger than 65 years compared to 0.73 (95% CI: 0.56, 0.95) in the 185 patients 65 years or older.

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## 8.6 Renal Impairment

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

## 8.7 Hepatic Impairment

No dose adjustment is needed for patients with mild hepatic impairment (total bilirubin [TB] >1.0 to 1.5 times the upper limit of normal [ULN] or AST >ULN). YERVOY has not been studied in patients with moderate (TB >1.5 to 3.0 times ULN and any AST) or severe (TB >3 times ULN and any AST) hepatic impairment *[see Clinical Pharmacology (12.3)]*.

# 10 OVERDOSAGE

There is no information on overdosage with YERVOY.

# 11 DESCRIPTION

Ipilimumab is a recombinant, human monoclonal antibody that binds to the cytotoxic T-lymphocyte-associated antigen 4 (CTLA-4). Ipilimumab is an IgG1 kappa immunoglobulin with an approximate molecular weight of 148 kDa. Ipilimumab is produced in mammalian (Chinese hamster ovary) cell culture.

YERVOY is a sterile, preservative-free, clear to slightly opalescent, colorless to pale-yellow solution for intravenous infusion, which may contain a small amount of visible translucent-to-white, amorphous ipilimumab particulates. It is supplied in single-use vials of 50 mg/10 mL and 200 mg/40 mL. Each milliliter contains 5 mg of ipilimumab and the following inactive ingredients: diethylene triamine pentaacetic acid (DTPA) (0.04 mg), mannitol (10 mg), polysorbate 80 (vegetable origin) (0.1 mg), sodium chloride (5.85 mg), tris hydrochloride (3.15 mg), and Water for Injection, USP at a pH of 7.

# 12 CLINICAL PHARMACOLOGY

## 12.1 Mechanism of Action

CTLA-4 is a negative regulator of T-cell activity. Ipilimumab is a monoclonal antibody that binds to CTLA-4 and blocks the interaction of CTLA-4 with its ligands, CD80/CD86. Blockade of CTLA-4 has been shown to augment T-cell activation and proliferation, including the activation and proliferation of tumor infiltrating T-effector cells. Inhibition of CTLA-4 signaling can also reduce T-regulatory cell function, which may contribute to a general increase in T cell responsiveness, including the anti-tumor immune response.

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## 12.3 Pharmacokinetics

The pharmacokinetics (PK) of ipilimumab was studied in 785 patients with unresectable or metastatic melanoma who received doses of 0.3, 3, or 10 mg/kg once every 3 weeks for 4 doses. The PK of ipilimumab is linear in the dose range of 0.3 to 10 mg/kg. Following administration of YERVOY every 3 weeks, the systemic accumulation was 1.5-fold or less. Steady-state concentrations of ipilimumab were reached by the third dose; the mean $C_{min}$ at steady state was 19.4 mcg/mL at 3 mg/kg and 58.1 mcg/mL at 10 mg/kg every 3 weeks. The mean value (percent coefficient of variation) based on population PK analysis for the terminal half-life ($t_{1/2}$) was 15.4 days (34%) and for clearance (CL) was 16.8 mL/h (38%).

*YERVOY with nivolumab:*

When YERVOY 1 mg/kg was administered in combination with nivolumab 3 mg/kg every 3 weeks, the CL of ipilimumab was unchanged compared to when YERVOY was administered alone.

When YERVOY 1 mg/kg every 6 weeks was administered in combination with nivolumab 3 mg/kg every 2 weeks, the CL of ipilimumab increased by 30% compared to YERVOY administered alone and the CL of nivolumab was unchanged compared to nivolumab administered alone.

When YERVOY 1 mg/kg every 6 weeks was administered in combination with nivolumab 360 mg every 3 weeks and chemotherapy, the CL of ipilimumab increased by 22% compared to YERVOY administered alone and the CL of nivolumab was unchanged compared to nivolumab administered alone.

When administered in combination, the CL of ipilimumab was unchanged in the presence of anti-ipilimumab antibodies and the CL of nivolumab increased by 20% in the presence of anti-nivolumab antibodies.

### Specific Populations

The effects of various covariates on the PK of ipilimumab were assessed in population PK analyses. The CL of ipilimumab increased with increasing body weight supporting the recommended body weight (mg/kg) based dosing. The following factors had no clinically important effect on the CL of ipilimumab: age (range: 23 to 88 years), sex, performance status, renal impairment, mild hepatic impairment, previous cancer therapy, and baseline lactate dehydrogenase (LDH) levels. The effect of race was not examined due to limited data available in non-Caucasian ethnic groups.

*Renal Impairment:* The effect of renal impairment on the CL of ipilimumab was evaluated in patients with mild (GFR <90 and ≥60 mL/min/1.73 $m^2$; n=349), moderate (GFR <60 and ≥30

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mL/min/1.73 $m^2$; n=82), or severe (GFR <30 and ≥15 mL/min/1.73 $m^2$; n=4) renal impairment compared to patients with normal renal function (GFR ≥90 mL/min/1.73 $m^2$; n=350) in population PK analyses. No clinically important differences in the CL of ipilimumab were found between patients with renal impairment and patients with normal renal function *[see Use in Specific Populations (8.6)]*.

*Hepatic Impairment:* The effect of hepatic impairment on the CL of ipilimumab was evaluated in patients with mild hepatic impairment (n=76) compared to patients with normal hepatic function (n=708) in the population PK analyses, and no clinically important differences in the CL of ipilimumab were found. YERVOY has not been studied in patients with moderate or severe hepatic impairment *[see Use in Specific Populations (8.7)]*.

*Pediatric Population: [see Use in Specific Populations (8.4)]*.

# 13 NONCLINICAL TOXICOLOGY

## 13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

The carcinogenic potential of ipilimumab has not been evaluated in long-term animal studies, and the genotoxic potential of ipilimumab has not been evaluated.

Fertility studies have not been performed with ipilimumab.

# 14 CLINICAL STUDIES

## 14.1 Unresectable or Metastatic Melanoma

The safety and efficacy of YERVOY were investigated in a randomized (3:1:1), double-blind, double-dummy trial (MDX010-20, NCT00094653) that included 676 randomized patients with unresectable or metastatic melanoma previously treated with one or more of the following: aldesleukin, dacarbazine, temozolomide, fotemustine, or carboplatin. Of these 676 patients, 403 were randomized to receive YERVOY at 3 mg/kg in combination with an investigational peptide vaccine with incomplete Freund's adjuvant (gp100), 137 were randomized to receive YERVOY at 3 mg/kg, and 136 were randomized to receive gp100 as a single agent. The trial enrolled only patients with HLA-A2*0201 genotype; this HLA genotype facilitates the immune presentation of the investigational peptide vaccine. The trial excluded patients with active autoimmune disease or those receiving systemic immunosuppression for organ transplantation. YERVOY/placebo was administered at 3 mg/kg as an intravenous infusion every 3 weeks for 4 doses. Gp100/placebo was administered at a dose of 2 mg peptide by deep subcutaneous injection every 3 weeks for 4 doses. Assessment of tumor response was conducted at weeks 12 and 24, and every 3 months thereafter. Patients with evidence of objective tumor response at 12 or 24 weeks had assessment for confirmation of durability of response at 16 or 28 weeks, respectively.

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The major efficacy outcome measure was overall survival (OS) in the YERVOY plus gp100 arm compared to that in the single-agent gp100 arm. Secondary efficacy outcome measures were OS in the YERVOY plus gp100 arm compared to the YERVOY arm, OS in the YERVOY arm compared to the gp100 arm, best overall response rate (BORR) at week 24 between each of the trial arms, and duration of response.

Of the randomized patients, 61%, 59%, and 54% in the YERVOY plus gp100, YERVOY, and gp100 arms, respectively, were men. Twenty-nine percent were ≥65 years of age, the median age was 57 years, 71% had M1c stage, 12% had a history of previously treated brain metastasis, 98% had ECOG performance status of 0 and 1, 23% had received aldesleukin, and 38% had elevated LDH level. Sixty-one percent of patients randomized to either YERVOY-containing arm received all 4 planned doses. The median duration of follow-up was 8.9 months.

The OS results are shown in Table 17 and Figure 1.

**Table 17: Overall Survival Results**

| | YERVOY n=137 | YERVOY+gp100 n=403 | gp100 n=136 |
|---|---|---|---|
| Hazard Ratio (vs. gp100) (95% CI) | 0.66 (0.51, 0.87) | 0.68 (0.55, 0.85) | |
| p-value | p=0.0026[a] | p=0.0004 | |
| Hazard Ratio (vs. YERVOY) (95% CI) | | 1.04 (0.83, 1.30) | |
| Median (months) (95% CI) | 10 (8.0, 13.8) | 10 (8.5, 11.5) | 6 (5.5, 8.7) |

[a] Not adjusted for multiple comparisons.

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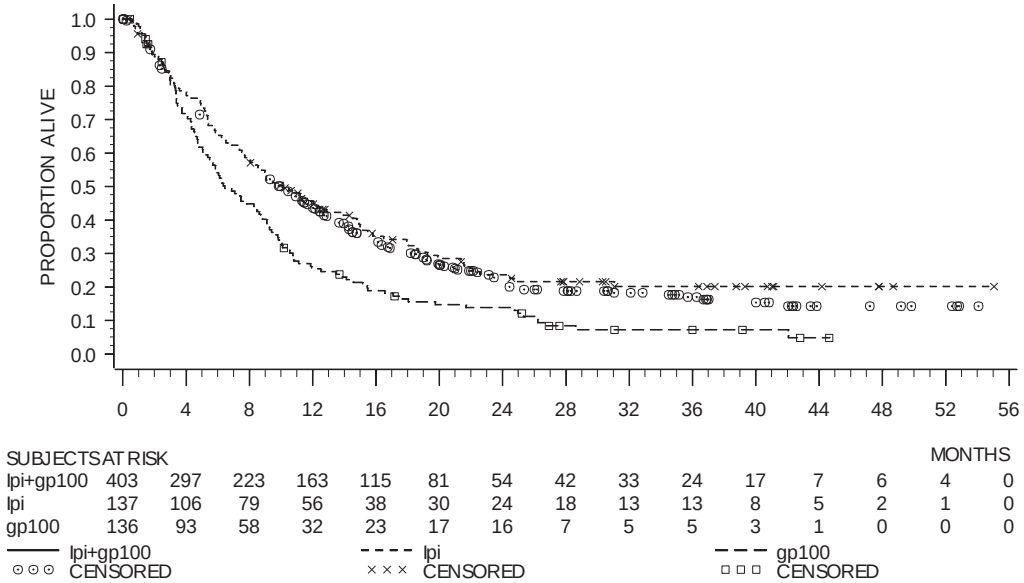
**Figure 1: Overall Survival**




The best overall response rate (BORR) as assessed by the investigator was 5.7% (95% CI: 3.7%, 8.4%) in the YERVOY plus gp100 arm, 10.9% (95% CI: 6.3%, 17.4%) in the YERVOY arm, and 1.5% (95% CI: 0.2%, 5.2%) in the gp100 arm. The median duration of response was 11.5 months in the YERVOY plus gp100 arm and has not been reached in the YERVOY or gp100 arm.

## 14.2 Adjuvant Treatment of Melanoma

The safety and efficacy of YERVOY for the adjuvant treatment of melanoma were investigated in CA184-029 (NCT00636168), a randomized (1:1), double-blind, placebo-controlled trial in patients with resected Stage IIIA (>1 mm nodal involvement), IIIB, and IIIC (with no in-transit metastases) histologically confirmed cutaneous melanoma. Patients were randomized to receive YERVOY 10 mg/kg or placebo as an intravenous infusion every 3 weeks for 4 doses, followed by YERVOY 10 mg/kg or placebo every 12 weeks from Week 24 to Week 156 (3 years) or until documented disease recurrence or unacceptable toxicity. Enrollment required complete resection of melanoma with full lymphadenectomy within 12 weeks prior to randomization. Patients with prior therapy for melanoma, autoimmune disease, and prior or concomitant use of immunosuppressive agents were ineligible. Randomization was stratified by stage according to American Joint Committee on Cancer (AJCC) 2002 classification (Stage IIIA >1 mm nodal involvement, Stage IIIB, Stage IIIC with 1 to 3 involved lymph nodes, and Stage IIIC with ≥4 involved lymph nodes) and by region (North America, Europe, and Australia). The major efficacy outcome measures were independent review committee (IRC)-assessed recurrence-free survival

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(RFS), defined as the time between the date of randomization and the earliest date of first recurrence (local, regional, or distant metastasis) or death, and overall survival. Tumor assessment was conducted every 12 weeks for the first 3 years then every 24 weeks until distant recurrence.

Among 951 patients enrolled, 475 were randomized to receive YERVOY and 476 to placebo. Median age was 51 years old (range: 18 to 84), 62% were male, 99% were white, 94% had ECOG performance status of 0. With regard to disease stage, 20% had Stage IIIA with lymph nodes >1 mm, 44% had Stage IIIB, and 36% had Stage IIIC (with no in-transit metastases). Other disease characteristics of the trial population were: clinically palpable lymph nodes (58%), 2 or more positive lymph nodes (54%), and ulcerated primary lesions (42%).

The efficacy results are in Table 18 and in Figure 2.

**Table 18: Efficacy Results in CA184-029**

| | YERVOY N=475 | | Placebo N=476 |
|---|---|---|---|
| **Recurrence-Free Survival** | | | |
| Number of Events, n (%) | 234 (49%) | | 294 (62%) |
| Recurrence | 220 | | 289 |
| Death | 14 | | 5 |
| Median (months) | 26 | | 17 |
| (95% CI) | (19, 39) | | (13, 22) |
| Hazard Ratio | | 0.75 | |
| (95% CI) | | (0.64, 0.90) | |
| p-value (stratified log-rank[a]) | | p<0.002 | |
| **Overall Survival** | | | |
| Number of Events, n (%) | | | |
| Death | 162 (34%) | | 214 (45%) |
| Hazard Ratio | | 0.72 | |
| (95% CI) | | (0.58, 0.88) | |
| p-value (stratified log-rank[a]) | | p<0.002 | |

[a] Stratified by disease stage.

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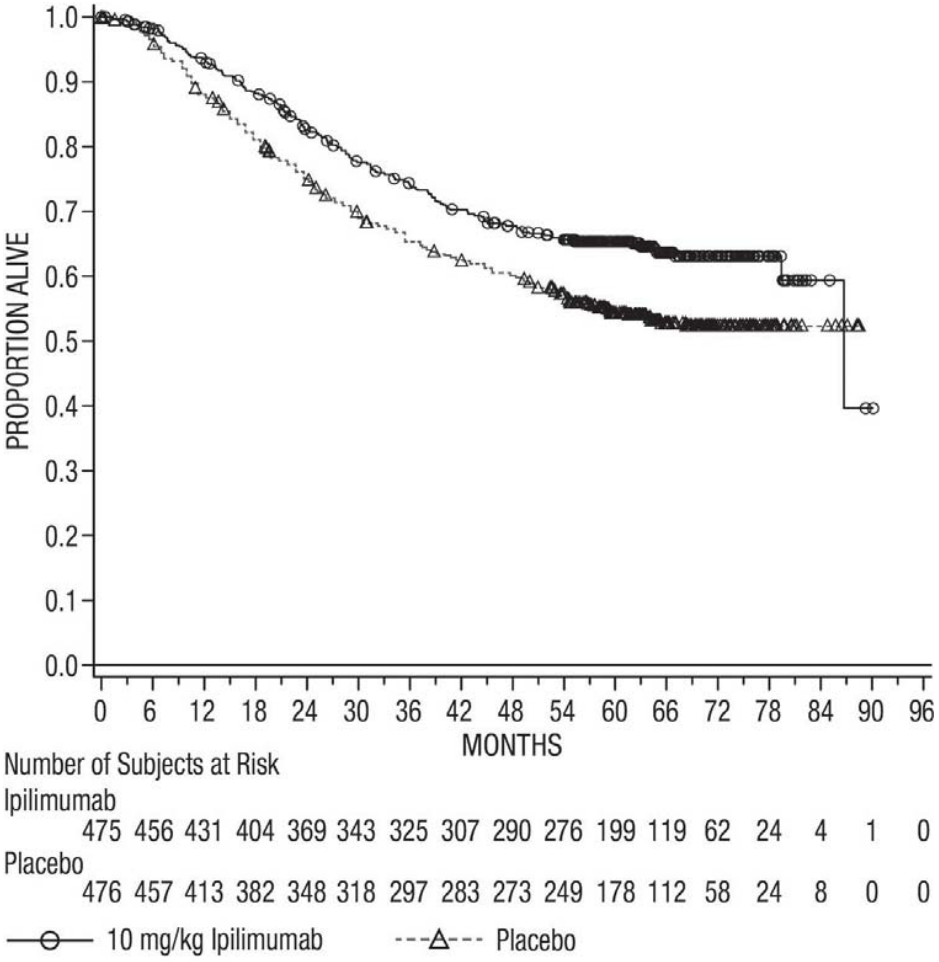
**Figure 2: Overall Survival**




## 14.3 Previously Untreated Advanced Renal Cell Carcinoma

CHECKMATE-214 (NCT02231749) was a randomized (1:1), open-label study in patients with previously untreated advanced RCC. Patients were included regardless of their PD-L1 status. CHECKMATE-214 excluded patients with any history of or concurrent brain metastases, active autoimmune disease, or medical conditions requiring systemic immunosuppression. Patients were stratified by International Metastatic RCC Database Consortium (IMDC) prognostic score and region.

Efficacy was evaluated in intermediate/poor-risk patients with at least 1 or more of 6 prognostic risk factors as per the IMDC criteria (less than one year from time of initial renal cell carcinoma diagnosis to randomization, Karnofsky performance status <80%, hemoglobin less than the lower limit of normal, corrected calcium of greater than 10 mg/dL, platelet count greater than the upper limit of normal, and absolute neutrophil count greater than the upper limit of normal).

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Patients were randomized to nivolumab 3 mg/kg plus YERVOY 1 mg/kg (n=425) administered intravenously every 3 weeks for 4 doses followed by nivolumab monotherapy 3 mg/kg every two weeks or to sunitinib (n=422) administered orally 50 mg daily for 4 weeks followed by 2 weeks off, every cycle. Treatment continued until disease progression or unacceptable toxicity.

The median age was 61 years (range: 21 to 85) with 38% ≥65 years of age and 8% ≥75 years of age. The majority of patients were male (73%) and white (87%) and 26% and 74% of patients had a baseline KPS of 70% to 80% and 90% to 100%, respectively.

The major efficacy outcome measures were OS, PFS (IRRC-assessed), and confirmed ORR (IRRC-assessed) in intermediate/poor-risk patients. In this population, the trial demonstrated statistically significant improvement in OS and ORR for patients randomized to nivolumab plus YERVOY as compared with sunitinib (Table 19 and Figure 3). OS benefit was observed regardless of PD-L1 expression level. The trial did not demonstrate a statistically significant improvement in PFS.

The efficacy results from CHECKMATE-214 are presented in Table 19 and Figure 3.

**Table 19: Efficacy Results - CHECKMATE-214**

| | **Intermediate/Poor Risk** | |
|---|---|---|
| | **Nivolumab plus YERVOY (n=425)** | **Sunitinib (n=422)** |
| **Overall Survival** | | |
| Deaths (%) | 140 (32.9) | 188 (44.5) |
| Median survival (months) | NE | 25.9 |
| Hazard ratio (99.8% CI)[a] | 0.63 (0.44, 0.89) | |
| p-value[b,c] | <0.0001 | |
| **Confirmed Objective Response Rate (95% CI)** | 41.6% (36.9, 46.5) | 26.5% (22.4, 31.0) |
| p-value[d,e] | <0.0001 | |
| Complete Response (CR) | 40 (9.4) | 5 (1.2) |
| Partial Response (PR) | 137 (32.2) | 107 (25.4) |
| Median duration of response in months (95% CI) | NE (21.8, NE) | 18.2 (14.8, NE) |
| **Progression-free Survival** | | |
| Disease progression or death (%) | 228 (53.6) | 228 (54.0) |
| Median (months) | 11.6 | 8.4 |
| Hazard ratio (99.1% CI)[a] | 0.82 (0.64, 1.05) | |
| p-value[b] | NS[f] | |

[a] Based on a stratified proportional hazards model.
[b] Based on a stratified log-rank test.
[c] p-value is compared to alpha 0.002 in order to achieve statistical significance.
[d] Based on the stratified DerSimonian-Laird test.
[e] p-value is compared to alpha 0.001 in order to achieve statistical significance.

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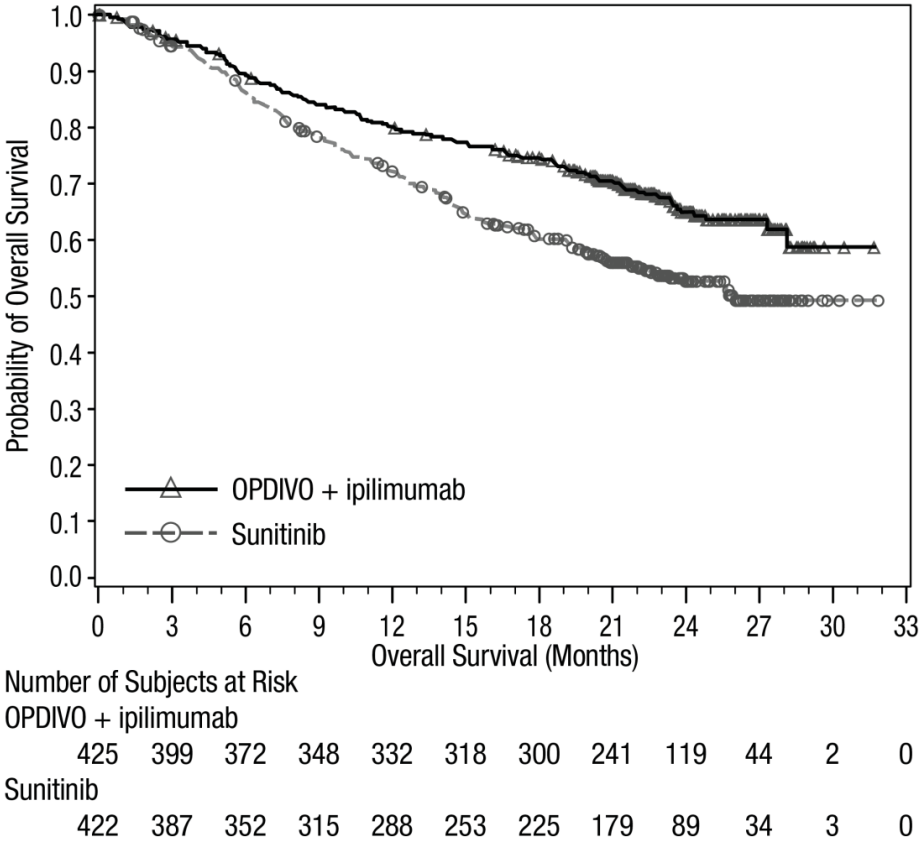
[f] Not Significant at alpha level of 0.009

**Figure 3: Overall Survival (Intermediate/Poor-Risk Population) - CHECKMATE-214**




CHECKMATE-214 also randomized 249 favorable risk patients as per IMDC criteria to nivolumab plus YERVOY (n=125) or to sunitinib (n=124). These patients were not evaluated as part of the efficacy analysis population. OS in favorable risk patients receiving nivolumab plus YERVOY compared to sunitinib has a hazard ratio of 1.45 (95% CI: 0.75, 2.81). The efficacy of nivolumab plus YERVOY in previously untreated renal cell carcinoma with favorable risk disease has not been established.

## 14.4 Microsatellite Instability-High (MSI-H) or Mismatch Repair Deficient (dMMR) Metastatic Colorectal Cancer

CHECKMATE-142 (NCT02060188) was a multicenter, non-randomized, multiple parallel-cohort, open-label study conducted in patients with locally determined dMMR or MSI-H metastatic CRC (mCRC) who had disease progression during or after prior treatment with fluoropyrimidine-, oxaliplatin-, or irinotecan-based chemotherapy. Key eligibility criteria were at least one prior line of treatment for metastatic disease, ECOG PS 0 or 1, and absence of the

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following: active brain metastases, active autoimmune disease, or medical conditions requiring systemic immunosuppression.

Patients enrolled in the YERVOY and nivolumab MSI-H mCRC cohort received YERVOY 1 mg/kg and nivolumab 3 mg/kg IV every 3 weeks for 4 doses, followed by nivolumab 3 mg/kg IV as a single agent every 2 weeks.

Tumor assessments were conducted every 6 weeks for the first 24 weeks and every 12 weeks thereafter. Efficacy outcome measures were overall response rate (ORR) as assessed by independent radiographic review committee (IRRC) using Response Evaluation Criteria in Solid Tumors (RECIST v1.1) and duration of response (DOR).

A total of 119 patients were enrolled in the YERVOY plus nivolumab cohort. The median age was 58 years (range: 21 to 88), with 32% ≥65 years of age and 9% ≥75 years of age; 59% were male and 92% were white. Baseline ECOG PS was 0 (45%) or 1 (55%), and 29% were reported to have Lynch Syndrome. Across the cohort, 69% received prior treatment with a fluoropyrimidine, oxaliplatin, and irinotecan; 10%, 40%, 24%, and 15% received 1, 2, 3, or ≥4 prior lines of therapy for metastatic disease, respectively, and 29% had received an anti-EGFR antibody.

Efficacy results are shown in Table 20.

**Table 20: Efficacy Results in CHECKMATE-142**

| | **YERVOY plus Nivolumab MSI-H/dMMR Cohort** | |
|---|---|---|
| | **All Patients (n=119)** | **Prior Treatment (Fluoropyrimidine, Oxaliplatin, and Irinotecan) (n=82)** |
| **IRRC Overall Response Rate; n (%)** | 58 (49%) | 38 (46%) |
| (95% CI)[a] | (39, 58) | (35, 58) |
| Complete Response (%) | 5 (4.2%) | 3 (3.7%) |
| Partial Response (%) | 53 (45%) | 35 (43%) |
| **Duration of Response** | | |
| Proportion with ≥6 months response duration | 83% | 89% |
| Proportion with ≥12[b] months response duration | 19% | 21% |

[a] Estimated using the Clopper-Pearson method.

[b] In the monotherapy cohort, 55% of the 20 patients with ongoing responses were followed for less than 12 months from the date of onset of response. In the combination cohort, 78% of the 51 patients with ongoing responses were followed for less than 12 months from the date of onset of response.

## 14.5 Hepatocellular Carcinoma

CHECKMATE-040 (NCT01658878) was a multicenter, multiple cohort, open-label trial conducted in patients with HCC who progressed on or were intolerant to sorafenib. Additional

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eligibility criteria included histologic confirmation of HCC and Child-Pugh Class A cirrhosis. The trial excluded patients with active autoimmune disease, brain metastasis, a history of hepatic encephalopathy, clinically significant ascites, infection with HIV, or active co-infection with hepatitis B virus (HBV) and hepatitis C virus (HCV) or HBV and hepatitis D virus (HDV); however, patients with only active HBV or HCV were eligible.

The efficacy of YERVOY 3 mg/kg in combination with nivolumab 1 mg/kg was evaluated in Cohort 4 of CHECKMATE-040. A total of 49 patients received the combination regimen, which was administered every 3 weeks for four doses, followed by single-agent nivolumab at 240 mg every 2 weeks until disease progression or unacceptable toxicity.

The median age was 60 years (range: 18 to 80); 88% were male; 74% were Asian, and 25% were White. Baseline ECOG performance status was 0 (61%) or 1 (39%). Fifty-seven percent (57%) of patients had active HBV infection, 8% had active HCV infection, and 35% had no evidence of active HBV or HCV. The etiology for HCC was alcoholic liver disease in 16% and non-alcoholic liver disease in 6% of patients. Child-Pugh class and score was A5 for 82% and A6 for 18%; 80% of patients had extrahepatic spread; 35% had vascular invasion; and 51% had alfa-fetoprotein (AFP) levels ≥400 µg/L. Prior treatment history included surgery (74%), radiotherapy (29%), or local treatment (59%). All patients had received prior sorafenib, of whom 10% were unable to tolerate sorafenib; 29% of patients had received 2 or more prior systemic therapies.

Efficacy results are shown in Table 21.

**Table 21: Efficacy Results - Cohort 4 of CHECKMATE-040**

| | **YERVOY and Nivolumab (Cohort 4) (n=49)** |
|---|---|
| **Overall Response Rate per BICR,[a] n (%), RECIST v1.1** | 16 (33%) |
| (95% CI)[b] | (20, 48) |
| Complete response | 4 (8%) |
| Partial response | 12 (24%) |
| **Duration of Response per BICR,[a] RECIST v1.1** | n=16 |
| Range (months) | 4.6, 30.5+ |
| Percent with duration ≥6 months | 88% |
| Percent with duration ≥12 months | 56% |
| Percent with duration ≥24 months | 31% |
| **Overall Response Rate per BICR,[a] n (%), mRECIST** | 17 (35%) |
| (95% CI)[b] | (22, 50) |
| Complete response | 6 (12%) |
| Partial response | 11 (22%) |

[a] Confirmed by BICR.

[b] Confidence interval is based on the Clopper and Pearson method.

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## 14.6 Metastatic Non-Small Cell Lung Cancer

First-line Treatment of Metastatic Non-Small Cell Lung Cancer (NSCLC) Expressing PD-L1 (≥1%): In Combination with Nivolumab

CHECKMATE-227 (NCT02477826) was a randomized, open-label, multi-part trial in patients with metastatic or recurrent NSCLC. The study included patients (18 years of age or older) with histologically confirmed Stage IV or recurrent NSCLC (per the 7th International Association for the Study of Lung Cancer [ASLC] classification), ECOG performance status 0 or 1, and no prior anticancer therapy. Patients were enrolled regardless of their tumor PD-L1 status. Patients with known EGFR mutations or ALK translocations sensitive to available targeted inhibitor therapy, untreated brain metastases, carcinomatous meningitis, active autoimmune disease, or medical conditions requiring systemic immunosuppression were excluded from the study. Patients with treated brain metastases were eligible if neurologically returned to baseline at least 2 weeks prior to enrolment, and either off corticosteroids, or on a stable or decreasing dose of <10 mg daily prednisone equivalents.

Primary efficacy results were based on Part 1a of the study, which was limited to patients with PD-L1 tumor expression ≥1%. Tumor specimens were evaluated prospectively using the PD-L1 IHC 28-8 pharmDx assay at a central laboratory. Randomization was stratified by tumor histology (non-squamous versus squamous). The evaluation of efficacy relied on the comparison between:

- YERVOY 1 mg/kg administered intravenously over 30 minutes every 6 weeks in combination with nivolumab 3 mg/kg administered intravenously over 30 minutes every 2 weeks; or
- Platinum-doublet chemotherapy

Chemotherapy regimens consisted of pemetrexed (500 mg/m$^2$) and cisplatin (75 mg/m$^2$) or pemetrexed (500 mg/m$^2$) and carboplatin (AUC 5 or 6) for non-squamous NSCLC or gemcitabine (1000 or 1250 mg/m$^2$) and cisplatin (75 mg/m$^2$) or gemcitabine (1000 mg/m$^2$) and carboplatin (AUC 5) (gemcitabine was administered on Days 1 and 8 of each cycle) for squamous NSCLC.

Study treatment continued until disease progression, unacceptable toxicity, or for up to 24 months. Treatment continued beyond disease progression if a patient was clinically stable and was considered to be deriving clinical benefit by the investigator. Patients who discontinued combination therapy because of an adverse event attributed to YERVOY were permitted to continue nivolumab as a single agent. Tumor assessments were performed every 6 weeks from the first dose of study treatment for the first 12 months, then every 12 weeks until disease progression or study treatment was discontinued. The primary efficacy outcome measure was OS. Additional efficacy outcome measures included PFS, ORR, and duration of response as assessed by BICR.

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In Part 1a, a total of 793 patients were randomized to receive either YERVOY in combination with nivolumab (n=396) or platinum-doublet chemotherapy (n=397). The median age was 64 years (range: 26 to 87) with 49% of patients ≥65 years and 10% of patients ≥75 years, 76% White, and 65% male. Baseline ECOG performance status was 0 (34%) or 1 (65%), 50% with PD-L1 ≥50%, 29% with squamous and 71% with non-squamous histology, 10% had brain metastases, and 85% were former/current smokers.

The study demonstrated a statistically significant improvement in OS for PD-L1 ≥1% patients randomized to the YERVOY and nivolumab arm compared to platinum-doublet chemotherapy arm. The OS results are presented in Table 22 and Figure 4.

**Table 22: Efficacy Results (PD-L1 ≥1%) - CHECKMATE-227 Part 1a**

| | **YERVOY and Nivolumab (n=396)** | **Platinum-Doublet Chemotherapy (n=397)** |
|---|---|---|
| **Overall Survival** | | |
| Events (%) | 258 (65%) | 298 (75%) |
| Median (months)[a] (95% CI) | 17.1 (15, 20.1) | 14.9 (12.7, 16.7) |
| Hazard ratio (95% CI)[b] | 0.79 (0.67, 0.94) | |
| Stratified log-rank p-value | 0.0066 | |

[a] Kaplan-Meier estimate.
[b] Based on a stratified Cox proportional hazard model.

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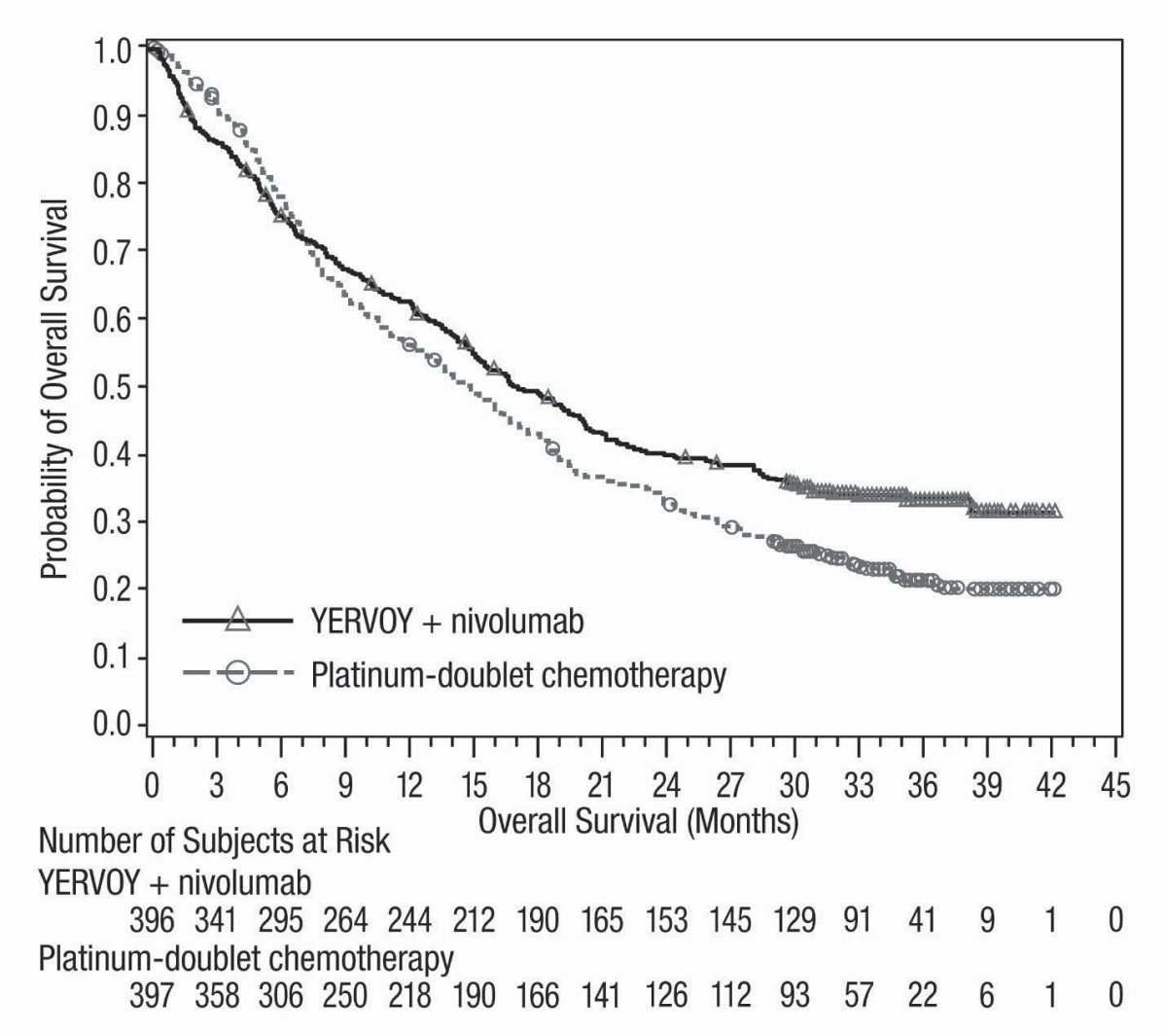
**Figure 4: Overall Survival (PD-L1 ≥1%) - CHECKMATE-227**




BICR-assessed PFS showed a HR of 0.82 (95% CI: 0.69, 0.97), with a median PFS of 5.1 months (95% CI: 4.1, 6.3) in the YERVOY and nivolumab arm and 5.6 months (95% CI: 4.6, 5.8) in the platinum-doublet chemotherapy arm. The BICR-assessed confirmed ORR was 36% (95% CI: 31, 41) in the YERVOY and nivolumab arm and 30% (95% CI: 26, 35) in the platinum-doublet chemotherapy arm. Median duration of response observed in the YERVOY and nivolumab arm was 23.2 months and 6.2 months in the platinum-doublet chemotherapy arm.

First-line Treatment of Metastatic or Recurrent NSCLC: In Combination with Nivolumab and Platinum-Doublet Chemotherapy

CHECKMATE-9LA (NCT03215706) was a randomized, open-label trial in patients with metastatic or recurrent NSCLC. The trial included patients (18 years of age or older) with histologically confirmed Stage IV or recurrent NSCLC (per the 7th International Association for

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the Study of Lung Cancer classification [IASLC]), ECOG performance status 0 or 1, and no prior anticancer therapy (including EGFR and ALK inhibitors) for metastatic disease. Patients were enrolled regardless of their tumor PD-L1 status. Patients with known EGFR mutations or ALK translocations sensitive to available targeted inhibitor therapy, untreated brain metastases, carcinomatous meningitis, active autoimmune disease, or medical conditions requiring systemic immunosuppression were excluded from the study. Patients with stable brain metastases were eligible for enrollment.

Patients were randomized 1:1 to receive either:

- YERVOY 1 mg/kg administered intravenously over 30 minutes every 6 weeks, nivolumab 360 mg administered intravenously over 30 minutes every 3 weeks, and platinum-doublet chemotherapy administered intravenously every 3 weeks for 2 cycles, or
- platinum-doublet chemotherapy administered every 3 weeks for 4 cycles.

Platinum-doublet chemotherapy consisted of either carboplatin (AUC 5 or 6) and pemetrexed 500 mg/mg$^2$, or cisplatin 75 mg/m$^2$ and pemetrexed 500 mg/m$^2$ for non-squamous NSCLC; or carboplatin (AUC 6) and paclitaxel 200 mg/m$^2$ for squamous NSCLC. Patients with non-squamous NSCLC in the control arm could receive optional pemetrexed maintenance therapy. Stratification factors for randomization were tumor PD-L1 expression level (≥1% versus <1% or non-quantifiable), histology (squamous versus non-squamous), and sex (male versus female). Study treatment continued until disease progression, unacceptable toxicity, or for up to 2 years. Treatment could continue beyond disease progression if a patient was clinically stable and was considered to be deriving clinical benefit by the investigator. Patients who discontinued combination therapy because of an adverse reaction attributed to YERVOY were permitted to continue nivolumab as a single agent as part of the study. Tumor assessments were performed every 6 weeks from the first dose of study treatment for the first 12 months, then every 12 weeks until disease progression or study treatment was discontinued. The primary efficacy outcome measure was OS. Additional efficacy outcome measures included PFS, ORR, and duration of response as assessed by BICR.

A total of 719 patients were randomized to receive either YERVOY in combination with nivolumab and platinum-doublet chemotherapy (n=361) or platinum-doublet chemotherapy (n=358). The median age was 65 years (range: 26 to 86) with 51% of patients ≥65 years and 10% of patients ≥75 years. The majority of patients were White (89%) and male (70%). Baseline ECOG performance status was 0 (31%) or 1 (68%), 57% had tumors with PD-L1 expression ≥1% and 37% had tumors with PD-L1 expression that was <1%, 32% had tumors with squamous histology and 68% had tumors with non-squamous histology, 17% had CNS metastases, and 86% were former or current smokers.

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The study demonstrated a statistically significant benefit in OS, PFS, and ORR. Efficacy results from the prespecified interim analysis when 351 events were observed (87% of the planned number of events for final analysis) are presented in Table 23.

**Table 23: Efficacy Results - CHECKMATE-9LA**

| | YERVOY and Nivolumab and Platinum-Doublet Chemotherapy (n=361) | Platinum-Doublet Chemotherapy (n=358) |
|---|---|---|
| **Overall Survival** | | |
| Events (%) | 156 (43.2) | 195 (54.5) |
| Median (months) (95% CI) | 14.1 (13.2, 16.2) | 10.7 (9.5, 12.5) |
| Hazard ratio (96.71% CI)[a] | 0.69 (0.55, 0.87) | |
| Stratified log-rank p-value[b] | 0.0006 | |
| **Progression-free Survival per BICR** | | |
| Events (%) | 232 (64.3) | 249 (69.6) |
| Hazard ratio (97.48% CI)[a] | 0.70 (0.57, 0.86) | |
| Stratified log-rank p-value[c] | 0.0001 | |
| Median (months)[d] (95% CI) | 6.8 (5.6, 7.7) | 5.0 (4.3, 5.6) |
| **Overall Response Rate per BICR (%)** | 38 | 25 |
| (95% CI)[e] | (33, 43) | (21, 30) |
| Stratified CMH test p-value[f] | 0.0003 | |
| **Duration of Response per BICR** | | |
| Median (months) (95% CI)[d] | 10.0 (8.2, 13.0) | 5.1 (4.3, 7.0) |

[a] Based on a stratified Cox proportional hazard model.
[b] p-value is compared with the allocated alpha of 0.033 for this interim analysis.
[c] p-value is compared with the allocated alpha of 0.0252 for this interim analysis.
[d] Kaplan-Meier estimate.
[e] Confidence interval based on the Clopper and Pearson Method.
[f] p-value is compared with the allocated alpha of 0.025 for this interim analysis.

With an additional 4.6 months of follow-up the hazard ratio for overall survival was 0.66 (95% CI: 0.55, 0.80) and median survival was 15.6 months (95% CI: 13.9, 20.0) and 10.9 months (95% CI: 9.5, 12.5) for patients receiving YERVOY and nivolumab and platinum-doublet chemotherapy or platinum-doublet chemotherapy, respectively (Figure 5).

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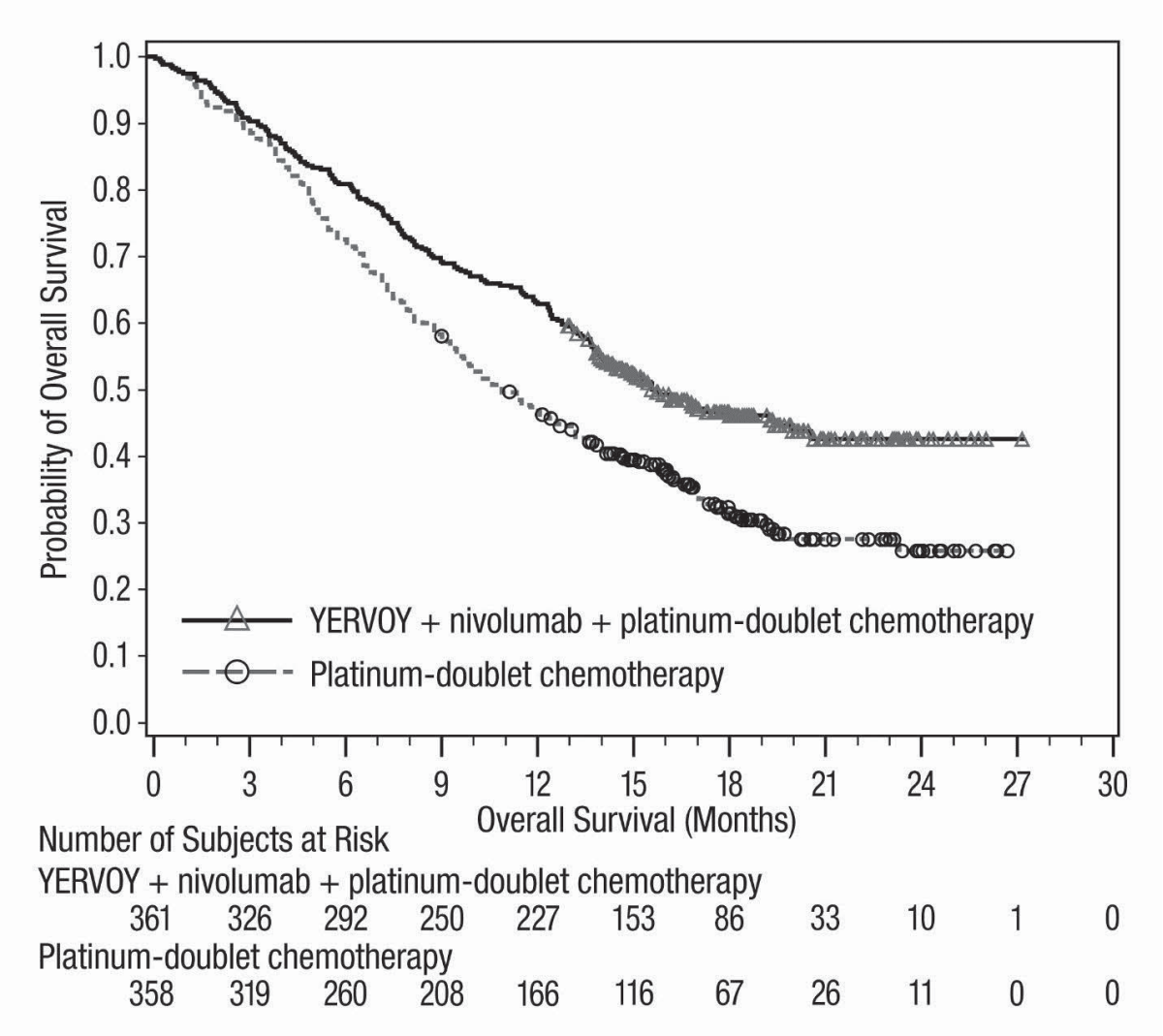
**Figure 5: Overall Survival - CHECKMATE-9LA**




## 16 HOW SUPPLIED/STORAGE AND HANDLING

YERVOY (ipilimumab) Injection is available as follows:

| Carton Contents | NDC |
|---|---|
| One 50 mg vial (5 mg/mL), single-use vial | NDC 0003-2327-11 |
| One 200 mg vial (5 mg/mL), single-use vial | NDC 0003-2328-22 |

Store YERVOY under refrigeration at 2°C to 8°C (36°F to 46°F). Protect YERVOY from light by storing in the original carton until time of use. Do not freeze or shake.

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# 17 PATIENT COUNSELING INFORMATION

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

### Immune-Mediated Adverse Reactions

Inform patients of the risk of immune-mediated adverse reactions that may require corticosteroid treatment and withholding or discontinuation of YERVOY, including:

- Enterocolitis/Colitis: Advise patients to contact their healthcare provider immediately for diarrhea or severe abdominal pain *[see Warnings and Precautions (5.1)]*.
- Hepatitis: Advise patients to contact their healthcare provider immediately for jaundice, severe nausea or vomiting, pain on the right side of abdomen, lethargy, or easy bruising or bleeding *[see Warnings and Precautions (5.2)]*.
- Skin Adverse Reactions: Advise patients to contact their healthcare provider immediately for rash *[see Warnings and Precautions (5.3)]*.
- Neuropathies: Advise patients to contact their healthcare provider immediately for neuropathies *[see Warnings and Precautions (5.4)]*.
- Endocrinopathies: Advise patients to contact their healthcare provider immediately for signs or symptoms of hypophysitis, adrenal insufficiency, hypothyroidism, hyperthyroidism, and diabetes mellitus *[see Warnings and Precautions (5.5)]*.
- Pneumonitis: Advise patients to contact their healthcare provider immediately for any new or worsening cough, chest pain, or shortness of breath *[see Warnings and Precautions (5.6)]*.
- Nephritis and Renal Dysfunction: Advise patients to contact their healthcare provider immediately for signs or symptoms of nephritis including decreased urine output, blood in urine, swelling in ankles, loss of appetite, and any other symptoms of renal dysfunction *[see Warnings and Precautions (5.7)]*.
- Encephalitis: Advise patients to contact their healthcare provider immediately for neurological signs or symptoms of encephalitis *[see Warnings and Precautions (5.8)]*.

### Infusion Reactions

- Advise patients of the potential risk of infusion reaction *[see Warnings and Precautions (5.9)]*.

### Females of Reproductive Potential

- Advise female patients that YERVOY can cause fetal harm. Advise females of reproductive potential to use effective contraception during treatment with YERVOY and for 3 months after the last dose *[see Use in Specific Populations (8.3)]*.
- Advise female patients to contact their healthcare provider with a known or suspected pregnancy. Advise females who may have been exposed to YERVOY during pregnancy to contact Bristol-Myers Squibb at 1-800-721-5072 *[see Warnings and Precautions (5.11) and Use in Specific Populations (8.1, 8.3)]*. Advise patients that there is a Pregnancy Safety

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Surveillance Study that monitors pregnancy outcomes in women exposed to YERVOY during pregnancy, and they can be enrolled by calling 1-844-593-7869 *[see Use in Specific Populations (8.1)]*.

### Lactation

- Advise women not to breastfeed during treatment with YERVOY and for 3 months after the last dose *[see Use in Specific Populations (8.2)]*.

Manufactured by:
Bristol-Myers Squibb Company
Princeton, NJ 08543 USA
U.S. License No. 1713

[print code]

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**MEDICATION GUIDE**
**YERVOY® (yur-voi)**
**(ipilimumab)**
**injection**

Read this Medication Guide before you start receiving YERVOY and before each infusion. There may be new information. If your healthcare provider prescribes YERVOY in combination with nivolumab, also read the Medication Guide that comes with nivolumab. This Medication Guide does not take the place of talking with your healthcare provider about your medical condition or your treatment.

**What is the most important information I should know about YERVOY?**

YERVOY can cause serious side effects in many parts of your body which can lead to death. These problems may happen anytime during treatment with YERVOY or after you have completed treatment. Some of these problems may happen more often when YERVOY is used in combination with nivolumab.

**Call your healthcare provider right away if you develop any of these signs or symptoms or they get worse. Do not try to treat symptoms yourself.**

**Intestinal problems (colitis) that can cause tears or holes (perforation) in the intestines.** Signs and symptoms of colitis may include:

- diarrhea (loose stools) or more bowel movements than usual
- mucus or blood in your stools
- dark, tarry, sticky stools
- stomach pain (abdominal pain) or tenderness
- you may or may not have fever

**Liver problems (hepatitis) that can lead to liver failure. Signs and symptoms of hepatitis may include:**

- yellowing of your skin or the whites of your eyes
- dark urine (tea colored)
- nausea or vomiting
- pain on the right side of your stomach
- bleeding or bruise more easily than normal
- decreased energy

**Skin problems that can lead to severe skin reaction. Signs and symptoms of severe skin reactions may include:**

- skin rash with or without itching
- sores in your mouth
- your skin blisters or peels

**Nerve problems that can lead to paralysis. Symptoms of nerve problems may include:**

- unusual weakness of legs, arms, or face
- numbness or tingling in hands or feet

**Hormone gland problems (especially the pituitary, adrenal, and thyroid glands). Signs and symptoms that your glands are not working properly may include:**

- persistent or unusual headaches
- unusual sluggishness
- feeling cold all the time
- weight gain
- changes in mood or behavior such as decreased sex drive, irritability, or forgetfulness
- dizziness or fainting

**Lung problems (pneumonitis). Symptoms of pneumonitis may include:**

- new or worsening cough
- chest pain
- shortness of breath

**Kidney problems, including nephritis and kidney failure. Signs of kidney problems may include:**

- decrease in the amount of urine
- blood in your urine
- swelling in your ankles
- loss of appetite

**Inflammation of the brain (encephalitis). Signs and symptoms of encephalitis may include:**

- headache
- fever
- tiredness or weakness
- confusion
- memory problems
- sleepiness
- seeing or hearing things that are not really there (hallucinations)
- seizures
- stiff neck

**Eye problems. Symptoms may include:**

- blurry vision, double vision, or other vision problems
- eye pain or redness

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**Getting medical treatment right away may keep the problem from becoming more serious.**
Your healthcare provider will check you for these problems during treatment with YERVOY. Your healthcare provider may treat you with corticosteroid medicines. Your healthcare provider may need to delay or completely stop treatment with YERVOY if you have severe side effects.

**What is YERVOY?**
YERVOY is a prescription medicine used:

- **to treat a kind of skin cancer called melanoma.** YERVOY may be used:
  - in adults and children 12 years of age and older when melanoma has spread or cannot be removed by surgery
  - to help prevent melanoma from coming back after it and lymph nodes that contain cancer have been removed by surgery
- **in people with kidney cancer (renal cell carcinoma).** YERVOY may be used in combination with nivolumab in certain people when their cancer has spread.
- **in adults and children 12 years of age and older, with a type of colon or rectal cancer (colorectal cancer).**
  - YERVOY in combination with nivolumab may be used when your colon or rectal cancer:
    - has spread to other parts of the body (metastatic).
    - is microsatellite stability-high (MSI-H) or mismatch repair deficient (dMMR), **and**
    - You have tried treatment with a fluoropyrimidine, oxaliplatin, and irinotecan, and it did not work or is no longer working.
- **in people with liver cancer (hepatocellular carcinoma).**
  - YERVOY may be used in combination with nivolumab if you have previously received treatment with sorafenib.
- **in adults with a type of lung cancer called non-small cell lung cancer (NSCLC).**
  - YERVOY may be used in combination with nivolumab as your first treatment for NSCLC:
    - when your lung cancer has spread to other parts of your body (metastatic), and
    - your tumors are positive for PD-L1, but do not have an abnormal EGFR or ALK gene.
  - YERVOY may be used in combination with nivolumab and 2 cycles of chemotherapy that contains platinum and another chemotherapy medicine, as the first treatment of your NSCLC when your lung cancer:
    - has spread or grown, or comes back, **and**
    - your tumor does not have an abnormal EGFR or ALK gene.

It is not known if YERVOY is safe and effective in children younger than 12 years of age.

**Before you receive YERVOY, tell your healthcare provider about all your medical conditions, including if you:**

- have immune system problems (autoimmune disease), such as ulcerative colitis, Crohn's disease, lupus, or sarcoidosis
- have had an organ transplant
- have liver problems
- are pregnant or plan to become pregnant. YERVOY can harm your unborn baby.
  - Females who are able to become pregnant should use effective birth control during treatment with YERVOY and for 3 months after the last dose of YERVOY.
  - If you become pregnant or think you are pregnant, tell your healthcare provider right away. You or your healthcare provider should contact Bristol-Myers Squibb at 1-800-721-5072 as soon as you become aware of the pregnancy.
  - **Pregnancy Safety Surveillance Study: Females** who become pregnant during treatment with YERVOY are encouraged to enroll in a Pregnancy Safety Surveillance Study. The purpose of this study is to collect information about the health of you and your baby. You or your healthcare provider can enroll you in the Pregnancy Safety Surveillance Study by calling 1-844-593-7869.
- are breastfeeding or plan to breastfeed. It is not known if YERVOY passes into your breast milk.
  - **Do not** breastfeed during treatment with YERVOY and for 3 months after the last dose of YERVOY.

**Tell your healthcare provider about all the medicines you take,** including prescription and over-the-counter medicines, vitamins, and herbal supplements.

**How will I receive YERVOY?**

- YERVOY alone is given to you into your vein through an intravenous (IV) line over 90 minutes.
- When YERVOY is used in combination with nivolumab, nivolumab is given to you into your vein through an IV line over 30 minutes. Then YERVOY is also given through an IV over 30 minutes on the same day.

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- YERVOY in combination with nivolumab is usually given every 3 weeks for 4 doses. After that, nivolumab alone is usually given every 2 or 4 weeks. For NSCLC that has spread to other parts of your body, YERVOY is given every 6 weeks and nivolumab is given either every 2 or 3 weeks for up to 2 years. Your healthcare provider will determine if you will also need to receive chemotherapy every 3 weeks for 2 cycles.
- Your healthcare provider will decide how many treatments you will need.
- Your healthcare provider will do blood tests before starting and during treatment with YERVOY.
- It is important for you to keep all appointments with your healthcare provider. Call your healthcare provider if you miss an appointment. There may be special instructions for you.

**What are the possible side effects of YERVOY?**
**YERVOY can cause serious side effects, including:**

- **See "What is the most important information I should know about YERVOY?"**
- **Severe infusion reactions. Tell your doctor or nurse right away if you get these symptoms during an infusion of YERVOY:**
  - chills or shaking
  - itching or rash
  - flushing
  - difficulty breathing
  - dizziness
  - fever
  - feeling like passing out

**Graft-versus-host disease, a complication that can happen after receiving a bone marrow (stem cell) transplant that uses donor stem cells (allogeneic), may be severe, and can lead to death, if you receive YERVOY either before or after transplant. Your healthcare provider will monitor you for the following signs and symptoms: skin rash, liver inflammation, stomach-area (abdominal) pain, and diarrhea.**

The most common side effects of YERVOY when used alone include:

- feeling tired
- diarrhea
- nausea
- itching
- rash
- vomiting
- headache
- weight loss
- fever
- decreased appetite
- difficulty falling or staying asleep

The most common side effects of YERVOY when used in combination with nivolumab include:

- feeling tired
- rash
- itching
- diarrhea
- pain in muscles, bones, and joints
- cough
- fever
- decreased appetite
- nausea
- stomach-area (abdominal) pain
- headache
- vomiting
- shortness of breath
- dizziness
- low thyroid hormone levels (hypothyroidism)
- decreased weight

The most common side effects of YERVOY when used in combination with nivolumab and chemotherapy include:

- feeling tired
- pain in muscles, bones, and joints
- nausea
- diarrhea
- rash
- decreased appetite
- constipation
- itching

These are not all of the possible side effects of YERVOY.
Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

**General information about the safe and effective use of YERVOY.**

Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. You can ask your healthcare provider or pharmacist for information about YERVOY that is written for healthcare professionals.

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**What are the ingredients of YERVOY?**
**Active ingredient:** ipilimumab
**Inactive ingredients:** diethylene triamine pentaacetic acid (DTPA), mannitol, polysorbate 80, sodium chloride, tris hydrochloride, and Water for Injection

Manufactured by: Bristol-Myers Squibb Company, Princeton, NJ 08543 USA
For more information, call 1-800-321-1335
U.S. License No. 1713
[print code]

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This Medication Guide has been approved by the U.S. Food and Drug Administration. Revised: May 2020