WARNING: DEPRESSION AND SUICIDALITY IN PATIENTS WITH HUNTINGTON’S DISEASE
See full prescribing information for complete boxed warning.

- Increases the risk of depression and suicidal thoughts and behavior (suicidality) in patients with Huntington's disease (5.1)
- Balance risks of depression and suicidality with the clinical need for treatment of chorea when considering the use of AUSTEDO (5.1)
- Monitor patients for the emergence or worsening of depression, suicidality, or unusual changes in behavior (5.3)
- Inform patients, caregivers, and families of the risk of depression and suicidality and instruct to report behaviors of concern promptly to the treating physician (5.1)
- Exercise caution when treating patients with a history of depression or prior suicide attempts or ideation (5.1)
- AUSTEDO is contraindicated in patients who are suicidal, and in patients with untreated or inadequately treated depression (4, 5.1)

FULL PRESCRIBING INFORMATION: CONTENTS*

1 INDICATIONS AND USAGE

2 DOSAGE AND ADMINISTRATION

3 DOSAGE FORMS AND STRENGTHS

4 CONTRAINDICATIONS

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6 ADVERSE REACTIONS

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*Sections or subsections omitted from the full prescribing information are not listed.

AUSTEDO® (deutetrabenazine) tablets

- Swallow tablets whole; do not chew, crush, or break (2.1)
- If switching patients from tetrabenazine, discontinue tetrabenazine and initiate AUSTEDO the following day. See full prescribing information for recommended conversion table (2.2)
- Maximum recommended dosage of AUSTEDO in poor CYP2D6 metabolizers is 36 mg per day (i.e., 18 mg twice daily) (2.4, 8.7)

DOSAGE FORMS AND STRENGTHS

Tablets: 6 mg, 9 mg, and 12 mg (3)

CONTRAINDICATIONS

- Suicidal, or untreated/inadequately treated depression in patients with Huntington's disease (4, 5.1)
- Hepatic impairment (4, 8.6, 12.3)
- Taking reserpine, MAOIs, tetrabenazine (XENAZINE®), or valbenazine (4, 7.2, 7.3, 7.6)

WARNINGS AND PRECAUTIONS

- QT Prolongation: Avoid use in patients with congenital long QT syndrome or with arrhythmias associated with a prolonged QT interval (5.3)
- Neuroleptic Malignant Syndrome (NMS): Discontinue if this occurs (5.4)
- Akathisia, agitation, restlessness, and parkinsonism: Reduce dose or discontinue if this occurs (5.5, 5.6)
- Sedation/somnolence: May impair the patient's ability to drive or operate complex machinery (5.7)

ADVERSE REACTIONS

Most common adverse reactions (>8% of AUSTEDO-treated patients with Huntington's disease and greater than placebo): somnolence, diarrhea, dry mouth, and fatigue (6.1)

Most common adverse reactions (that occurred in 4% of AUSTEDO-treated patients with tardive dyskinesia and greater than placebo): nasopharyngitis and insomnia (6.1)

To report SUSPECTED ADVERSE REACTIONS, contact Teva Pharmaceuticals at 1-888-483-8279 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

DRUG INTERACTIONS

- Concomitant use of strong CYP2D6 inhibitors: Maximum recommended dose of AUSTEDO is 36 mg per day (18 mg twice daily) (2.3, 7.1)
- Alcohol or other sedating drugs: May have additive sedation and somnolence (7.5)

USE IN SPECIFIC POPULATIONS

Pregnancy: Based on animal data, may cause fetal harm (8.1)

See 17 for PATIENT COUNSELING INFORMATION and Medication Guide.

Revised: 12/2020
AUSTEDO® (deutetrabenazine) tablets

FULL PRESCRIBING INFORMATION

WARNING: DEPRESSION AND SUICIDALITY IN PATIENTS WITH HUNTINGTON’S DISEASE

AUSTEDO can increase the risk of depression and suicidal thoughts and behavior (suicidality) in patients with Huntington’s disease. Anyone considering the use of AUSTEDO must balance the risks of depression and suicidality with the clinical need for treatment of chorea. Closely monitor patients for the emergence or worsening of depression, suicidality, or unusual changes in behavior. Patients, their caregivers, and families should be instructed to report behaviors of concern promptly to the treating physician. Particular caution should be exercised in treating patients with a history of depression or prior suicide attempts or ideation, which are increased in frequency in Huntington’s disease. AUSTEDO is contraindicated in patients who are suicidal, and in patients with untreated or inadequately treated depression (see Contraindications (4) and Warnings and Precautions (5.1)).

1 INDICATIONS AND USAGE

AUSTEDO® is indicated for the treatment of:

• chorea associated with Huntington’s disease (see Clinical Studies (14.1))

• tardive dyskinesia in adults (see Clinical Studies (14.2))

2 DOSAGE AND ADMINISTRATION

2.1 Dosing Information

The dose of AUSTEDO is determined individually for each patient based on reduction of chorea or tardive dyskinesia and tolerability. When first prescribed to patients who are not being switched from tetrabenazine (a related VMAT2 inhibitor), the recommended starting dose of AUSTEDO is 6 mg administered orally once daily for patients with Huntington’s disease and 12 mg per day (6 mg twice daily) for patients with tardive dyskinesia.

• The dose of AUSTEDO may be increased at weekly intervals in increments of 6 mg per day to a maximum recommended daily dosage of 48 mg.

• Administer total daily dosages of 12 mg or above in two divided doses.

• Administer AUSTEDO with food (see Clinical Pharmacology (12.3)).

• Swallow AUSTEDO whole. Do not chew, crush, or break tablets.

2.2 Switching Patients from Tetrabenazine (XENAZINE®) to AUSTEDO

Discontinue tetrabenazine (XENAZINE®) and initiate AUSTEDO the following day. The recommended initial dosing regimen of AUSTEDO in patients switching from tetrabenazine (XENAZINE®) to AUSTEDO is shown in Table I.

Table 1: Recommended Initial Dosing Regimen when Switching from Tetrabenazine (XENAZINE®) to AUSTEDO

<table>
<thead>
<tr>
<th>Current tetrabenazine daily dosage</th>
<th>Initial regimen of AUSTEDO</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.5 mg</td>
<td>6 mg once daily</td>
</tr>
<tr>
<td>25 mg</td>
<td>6 mg twice daily</td>
</tr>
<tr>
<td>37.5 mg</td>
<td>9 mg twice daily</td>
</tr>
<tr>
<td>50 mg</td>
<td>12 mg twice daily</td>
</tr>
<tr>
<td>62.5 mg</td>
<td>15 mg twice daily</td>
</tr>
<tr>
<td>75 mg</td>
<td>18 mg twice daily</td>
</tr>
<tr>
<td>87.5 mg</td>
<td>21 mg twice daily</td>
</tr>
<tr>
<td>100 mg</td>
<td>24 mg twice daily</td>
</tr>
</tbody>
</table>

After patients are switched to AUSTEDO, the dose may be adjusted at weekly intervals (see Dose and Administration (2.3)).

2.3 Dosage Adjustment with Strong CYP2D6 Inhibitors

In patients receiving strong CYP2D6 inhibitors (e.g., quinidine, antipsychotics such as paroxetine, fluoxetine, and bupropion), the total daily dosage of AUSTEDO should not exceed 36 mg (maximum single dose of 18 mg) (see Drug Interactions (7.2) and Clinical Pharmacology (12.3)).

2.4 Dosage Adjustment in Poor CYP2D6 Metabolizers

In patients who are poor CYP2D6 metabolizers, the total daily dosage of AUSTEDO should not exceed 36 mg (maximum single dose of 18 mg) (see Use in Specific Populations (8.7)).

2.5 Discontinuation and Interruption of Treatment

Treatment with AUSTEDO can be discontinued without tapering. After treatment interruption of greater than one week, AUSTEDO therapy should be re-litrated when resumed. For treatment interruption of less than one week, treatment can be resumed at the previous maintenance dose without titration.

3 DOSAGE FORMS AND STRENGTHS

AUSTEDO tablets are available in the following strengths:

• The 6 mg tablets are round, purple-coated tablets, with “SD” over “6” printed in black ink on one side.

• The 9 mg tablets are round, blue-coated tablets, with “SD” over “9” printed in black ink on one side.

• The 12 mg tablets are round, beige-coated tablets, with “SD” over “12” printed in black ink on one side.

4 CONTRAINDICATIONS

AUSTEDO is contraindicated in patients:

• With Huntington’s disease who are suicidal, or have untreated or inadequately treated depression. (see Warnings and Precautions (5.1)).

• With hepatic impairment (see Use in Specific Populations (8.6), Clinical Pharmacology (12.3)).

• Taking reserpine. At least 20 days should elapse after stopping reserpine before starting AUSTEDO (see Drug Interactions (12.2)).

• Taking monoamine oxidase inhibitors (MAOIs). AUSTEDO should not be used in combination with an MAOI, or within 14 days of discontinuing therapy with an MAOI (see Drug Interactions (7.3)).

• Taking tetrabenazine (XENAZINE®) or valbenazine (see Drug Interactions (7.6)).

5 WARNINGS AND PRECAUTIONS

5.1 Depression and Suicidality in Patients with Huntington’s Disease

Patients with Huntington’s disease are at increased risk for depression, and suicidal ideation or behaviors (suicidality). AUSTEDO may increase the risk for suicidality in patients with Huntington’s disease.

In a 12-week, double-blind, placebo-controlled trial, suicidal ideation was reported by 2% of patients treated with AUSTEDO, compared to no patients on placebo; no suicide attempts and no completed suicides were reported. Depression was reported by 4% of patients treated with AUSTEDO.

When considering the use of AUSTEDO, the risk of suicidality should be balanced against the need for treatment of chorea. All patients treated with AUSTEDO should be observed for new or worsening depression or suicidality. If depression or suicidality does not resolve, consider discontinuing treatment with AUSTEDO.

Patients, their caregivers, and families should be informed of the risks of depression, worsening depression, and suicidality associated with AUSTEDO, and should be instructed to report behaviors of concern promptly to the treating physician.

Patients with Huntington’s disease who express suicidal ideation should be evaluated immediately.

5.2 Clinical Worsening and Adverse Events in Patients with Huntington’s Disease

Huntington’s disease is a progressive disorder characterized by changes in mood, cognition, chorea, rigidity, and functional capacity over time. VMAT2 inhibitors, including AUSTEDO, may cause cognitive impairment and functional capacity. Prescribers should periodically re-evaluate the need for AUSTEDO in their patients by assessing the effect on chorea and possible adverse effects, including sedation/somnia, depression and suicidality, parkinsonism, akathisia, restlessness, and cognitive decline. It may be difficult to distinguish between adverse reactions and progression of the underlying disease; therefore, it may be necessary to defer stopping the drug for a short period to help the clinician to distinguish between the two possibilities. In some patients, the underlying chorea itself may improve over time, decreasing the need for AUSTEDO.

5.3 QTc Prolongation

AUSTEDO should prolong the QT interval, but the degree of QT prolongation is not clinically significant when AUSTEDO is administered within the recommended dosage range (see Clinical Pharmacology (12.2)).

AUSTEDO should be avoided in patients with congenital long QT syndrome and in patients with a history of cardiac arrhythmias. Certain circumstances may increase the risk of the occurrence of torsade de points and/or sudden death in association with the use of drugs that prolong the QTc interval, including (1) bradycardia; (2) hypokalemia or hypomagnesemia; (3) concurrent use of other drugs that prolong the QTc interval; and (4) presence of congenital prolongation of the QT interval.

5.4 Neuroleptic Malignant Syndrome (NMS)

A potentially fatal syndrome sometimes referred to as Neuroleptic Malignant Syndrome (NMS) has been reported in association with drugs that reduce dopaminergic transmission. While NMS has not been observed in patients receiving AUSTEDO, it has been observed in patients receiving tetrabenazine (a closely related VMAT2 inhibitor). Clinicians should be alerted to the signs and symptoms associated with NMS. Clinical manifestations of NMS are hyperpyrexia, muscle rigidity, altered mental status, and evidence of autonomic instability (irregular pulse or blood pressure, tachycardia, diaphoresis, and cardiac dysrhythmia). Additional signs may include elevated creatinine phosphokinase, myoglobinuria, rhabdomyolysis, and acute renal failure. The diagnosis of NMS can be complicated; other serious medical illness (e.g., pneumonia, septicemia) and untreated or inadequately treated extrapyramidal disorders can present with similar signs and symptoms. Other important considerations in the differential diagnosis include central anticholinergic toxicity, heat stroke, drug fever, and primary central nervous system pathology.

The management of NMS should include (1) immediate discontinuation of AUSTEDO; (2) intensive symptomatic treatment and medical monitoring; and (3) treatment of any concomitant serious medical problems for which specific treatments are available. There is no general agreement about specific pharmacological treatment regimens for NMS.

Recurrence of NMS has been reported with resumption of drug therapy. If treatment with AUSTEDO is needed after recovery from NMS, patients should be monitored for signs of recurrence.

5.5 Akathisia, Agitation, and Restlessness

AUSTEDO may increase the risk of akathisia, agitation, and restlessness in patients with Huntington’s disease and tardive dyskinesia.

In a 12-week, double-blind, placebo-controlled trial in Huntington’s disease patients, akathisia, agitation, or restlessness was reported by 4% of patients treated with AUSTEDO, compared to 2% of patients on placebo; in patients with tardive dyskinesia, 2% of patients treated with AUSTEDO and 1% of patients on placebo experienced these events.

Patients receiving AUSTEDO should be monitored for signs and symptoms of restlessness and agitation, as these may be indicators of developing akathisia. If a patient develops akathisia during treatment with AUSTEDO, the AUSTEDO dose should be reduced; some patients may require discontinuation of therapy.

5.6 Parkinsonism

AUSTEDO may cause parkinsonism in patients with Huntington’s disease or tardive dyskinesia. Parkinsonism has also been observed with other VMAT2 inhibitors.

Because rigidity can develop as part of the underlying disease process in Huntington’s disease, it may be difficult to distinguish between potential drug-induced parkinsonism and progression of underlying Huntington’s disease. Drug-induced parkinsonism has the potential to cause more functional disability than untreated chorea for some patients with Huntington’s disease.

Postmarketing cases of parkinsonism in patients treated with AUSTEDO for tardive dyskinesia have been reported. Signs and symptoms in reported cases have included bradykinesia, gait disturbances, which led to falls in some cases, and the emergence or worsening of tremor. In most cases, the development of parkinsonism occurred within the first two weeks after starting or increasing the dose of AUSTEDO. In cases in which follow-up clinical information was available, parkinsonism was reported to resolve following discontinuation of AUSTEDO therapy.
AUSTEDO® (deutetrabenazine) tablets

If a patient develops parkinsonism during treatment with AUSTEDO, the AUSTEDO dose should be reduced; some patients may require discontinuation of therapy.

5.7 Sedation and Somnolence

Sedation is a common dose-limiting adverse reaction of AUSTEDO. In a 12-week, double-blind, placebo-controlled trial examining patients with Huntington’s disease, 11% of AUSTEDO-treated patients reported somnolence compared with 4% of patients on placebo and 9% of AUSTEDO-treated patients reported fatigue compared with 4% of placebo-treated patients. Patients should not perform activities requiring mental alertness to maintain the safety of themselves or others, such as operating a motor vehicle or operating hazardous machinery, until they are on a maintenance dose of AUSTEDO and know how the drug affects them.

5.8 Hyperprolactinemia

Serum prolactin levels were not evaluated in the AUSTEDO development program. Tetrabenazine, a closely related VMAT2 inhibitor, elevates serum prolactin concentrations in humans. Following administration of 25 mg of tetrabenazine to healthy volunteers, peak plasma prolactin levels increased 4- to 5-fold.

Tissue culture experiments indicate that approximately one-third of human breast cancers are prolactin-dependent in vitro, a factor of potential importance if AUSTEDO is being considered for a patient with previously detected breast cancer. Although amenorrhea, galactorrhea, gynecomastia, and impotence can be caused by elevated serum prolactin concentrations, the clinical significance of elevated serum prolactin concentrations for most patients is unknown. Chronic increase in serum prolactin levels (although not evaluated in the AUSTEDO or tetrabenazine development programs) has been associated with low levels of estrogen and increased risk of osteoporosis. If there is a clinical suspicion of symptomatic hyperprolactinemia, appropriate laboratory testing should be done and consideration should be given to discontinuation of AUSTEDO.

5.9 Binding to Melanin-Containing Tissues

Since deutetrabenazine or its metabolites bind to melanin-containing tissues, it could accumulate in these tissues over time. This raises the possibility that AUSTEDO may cause toxicity in these tissues after extended use. Neither ophthalmologic nor microscopic examination of the eye has been conducted in the chronic toxicity studies in a pigmented species such as dogs. Ophthalmologic monitoring in humans was inadequate to exclude the possibility of injury occurring after long-term exposure. The clinical relevance of deutetrabenazine’s binding to melanin-containing tissues is unknown. Although there are no specific recommendations for periodic ophthalmologic monitoring, prescribers should be aware of the possibility of long-term ophthalmologic effects [see Clinical Pharmacology (12.2)].

6 ADVERSE REACTIONS

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

• Depression and Suicidality in Patients with Huntington’s disease [see Warnings and Precautions (5.3)]
• QTc Prolongation [see Warnings and Precautions (5.3)]
• Neuroleptic Malignant Syndrome (NMS) [see Warnings and Precautions (5.4)]
• Akathisia, Agitation, and Restlessness [see Warnings and Precautions (5.5)]
• Parkinsonism [see Warnings and Precautions (5.6)]
• Sedation and Somnolence [see Warnings and Precautions (5.7)]
• Hyperprolactinemia [see Warnings and Precautions (5.8)]
• Binding to Melanin-Containing Tissues [see Warnings and Precautions (5.9)]

6.1 Clinical Trials Experience

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

Patients with Huntington’s Disease

Study 1 was a randomized, 12-week, placebo-controlled study in patients with chorea associated with Huntington’s disease, 11% of AUSTEDO-treated patients reported somnolence compared with 4% of patients on placebo and 9% of AUSTEDO-treated patients reported fatigue compared with 4% of placebo-treated patients. Patients should not perform activities requiring mental alertness to maintain the safety of themselves or others, such as operating a motor vehicle or operating hazardous machinery, until they are on a maintenance dose of AUSTEDO and know how the drug affects them.

Patients with Tardive Dyskinesia

The data described below reflect 410 tardive dyskinesia patients participating in clinical trials. AUSTEDO was studied primarily in two 12-week, placebo-controlled trials (fixed dose, dose escalation). The population was 18 to 80 years of age, and had tardive dyskinesia and had concurrent diagnoses of mood disorder (33%) or schizophrenia/schizoaffective disorder (63%). In these studies, AUSTEDO was administered in doses ranging from 12-48 mg per day. All patients continued on previous stable regimens of antipsychotics; 71% and 14% respectively of atypical and typical antipsychotic medications at study entry.

The most common adverse reactions occurring in greater than 3% of AUSTEDO-treated patients and greater than placebo were nasopharyngitis and insomnia. The adverse reactions occurring in 1-2% of patients treated with AUSTEDO (12-40 mg per day) and greater than in placebo were in 2% of patients in two double-blind, placebo-controlled studies in patients with tardive dyskinesia (Study 1 and Study 2) are summarized in Table 3.

Table 3: Adverse Reactions in 2 Placebo-Controlled Tardive Dyskinesia Studies (Study 1 and Study 2) of 12-week Treatment on AUSTEDO Reported in at Least 2% of Patients and Greater than Placebo

<table>
<thead>
<tr>
<th>Preferred Term</th>
<th>AUSTEDO (N=279) (%)</th>
<th>Placebo (N=131) (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nasopharyngitis</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Insomnia</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Depression/ Dysthmic disorder</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Akathisia/Agitation/Restlessness</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

One or more adverse reactions resulted in a reduction of the dose of study medication in 4% of AUSTEDO-treated patients and in 2% of placebo-treated patients.

7 DRUG INTERACTIONS

7.1 Strong CYP2D6 Inhibitors

A reduction in AUSTEDO dose may be necessary when adding a strong CYP2D6 inhibitor in patients maintained on a stable dose of AUSTEDO. Concomitant use of strong CYP2D6 inhibitors (e.g., paroxetine, fluoxetine, quinidine, bupropion) has been shown to increase the systemic exposure to the active dihydro-metabolites of deutetrabenazine by approximately 3-fold. The daily dose of AUSTEDO should not exceed 36 mg per day, and the maximum single dose of AUSTEDO should not exceed 18 mg in patients taking strong CYP2D6 inhibitors [see Dosage and Administration (2.3) and Clinical Pharmacology (12.3)].

7.2 Reserpine

Reserpine binds irreversibly to VMAT2 and the duration of its effect is several days. Prescribers should wait for chorea or dyskinesia to reemerge before administering AUSTEDO to help reduce the risk of overdose and major depletion of serotonin and norepinephrine in the central nervous system. At least 20 days should elapse after stopping reserpine before starting AUSTEDO. AUSTEDO and reserpine should not be used concomitantly [see Contraindications (4)].

7.3 Monoamine Oxidase Inhibitors (MAOIs)

AUSTEDO is contraindicated in patients taking MAOIs. AUSTEDO should not be used in combination with an MAOI, or within 14 days of discontinuing therapy with an MAOI [see Contraindications (4)].

7.4 Neuroleptic Drugs

The risk of parkinsonism, NMS, and akathisia may be increased by concomitant use of AUSTEDO and dopamine antagonists or antipsychotics.

7.5 Alcohol or Other Sedating Drugs

Concomitant use of alcohol or other sedating drugs may have additive effects and worsen sedation and somnolence [see Warnings and Precautions (5.7)].

7.6 Concomitant Tetrabenazine or Valbenazine

AUSTEDO is contraindicated in patients currently taking tetrabenazine or valbenazine. Concomitant use may be initiated the day following discontinuation of tetrabenazine [see Dosage and Administration (2.2)].

8 USE IN SPECIFIC POPULATIONS

8.1 Pregnancy

Risk Summary

There are no adequate data on the developmental risk associated with the use of AUSTEDO in pregnant women. Administration of deutetrabenazine to rats during organogenesis produced no clear adverse effect on embryofetal development. However, administration of tetrabenazine to rats throughout pregnancy and lactation resulted in an increase in stillbirths and postnatal offspring mortality [see Data].

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

Data

Animal Data

Oral administration of tetrabenazine (5, 10, or 30 mg/kg/day) or tetrabenazine (30 mg/kg/day) to pregnant rats during organogenesis had no clear effect on embryofetal development. In the U.S. general population, the estimated background risk of major birth defects and miscarriage in clinically recognized pregnancies is 2-4% and 15-20%, respectively. The background risk of major birth defects and miscarriage for the indicated population is unknown.

Data

Animal Data

Oral administration of tetrabenazine (5, 10, or 30 mg/kg/day) or tetrabenazine (30 mg/kg/day) to pregnant rats during organogenesis had no clear effect on embryofetal development. The highest dose tested was 6 times the maximum recommended human dose of 48 mg/day, on a body surface area (mg/m²) basis.

The effects of deutetrabenazine when administered during organogenesis to rabbits or during pregnancy and lactation in rats have not been assessed.

Tetrabenazine had no effects on embryofetal development when administered to pregnant rabbits during the period of organogenesis at oral doses up to 60 mg/kg/day. When tetrabenazine was administered to female rats (doses of 5, 15, and 30 mg/kg/day) from the beginning of organogenesis through the lactation period, an increase in stillbirths and offspring postnatal mortality was observed at 15 and 30 mg/kg/day, and delayed pup maturation was observed at all doses.
AUSTEDO® (deutetrabenazine) tablets

8.2 Lactation

Melanin Binding

Deutetrabenazine or its metabolites bind to melanin-containing tissues (i.e., eye, skin, fur) in pigmented rats. After a single oral dose of radiolabeled deutetrabenazine, radioactivity was still detected in eye and fur at 35 days following dosing (see Warnings and Precautions (5.9)).

12.3 Pharmacokinetics

Following oral administration of deutetrabenazine, the extent of absorption is at least 80%. Plasma concentrations of deutetrabenazine are generally below the limit of detection because of the extensive hepatic metabolism of deutetrabenazine to the active deuterated dihydro metabolites (HTBZ, c-HTBZ and β-HTBZ). Linear dose dependence of Cmax and AUC was observed for the active metabolites following single or multiple doses of deutetrabenazine (6 mg to 24 mg and 75 mg twice daily to 22.5 mg twice daily).

12.4 Clinical Pharmacology

AUSTEDO is primarily renally eliminated in the form of metabolites. The half-life of total (c+β)-HTBZ from deutetrabenazine is approximately 9 to 10 hours.

Austedo is primarily renally eliminated in the form of metabolites.

11 DESCRIPTION

AUSTEDO (deutetrabenazine) is a vesicular monoamine transporter 2 (VMAT2) inhibitor for oral administration. The molecular weight of deutetrabenazine is 323.46; the pKa is 6.31. Deutetrabenazine is a hexahydro-dimethoxybenzoquinolamine derivative and has the following chemical name: (RR)-SSS-3,4,5,6,7-tetrahydro-6,9-10-dimethoxy-d,-3-(2-methylpropyl)-2H-benzo[a]quinolinn-2-one. The molecular formula for deutetrabenazine is C18H15D1NO4. Deutetrabenazine is a racemic mixture containing the following structures:

\[
\begin{align*}
\text{RR-Deutetrabenazine} & \\
\text{SS-Deutetrabenazine} & \\
\end{align*}
\]

Deutetrabenazine is a white to slightly yellow crystalline powder that is sparingly soluble in water and soluble in ethanol.

AUSTEDO tablets contain 6 mg, 9 mg, or 12 mg deutetrabenazine, and the following inactive ingredients: starch hydroxypropyl, black iron oxide, n-butyl alcohol, butylated hydroxyanisole, butylated hydroxytoluene, magnesium stearate, mannitol, microcrystalline cellulose, polyethylene glycol, polyethylene oxide, polysorbate 80, polyvinyl alcohol, povidone, propylene glycol, shellac, talc, titanium dioxide, and FD&C blue #2 lake. The 6 mg tablets also contain FD&C red #40 lake. The 12 mg tablets also contain FD&C yellow #6 lake.

12 CLINICAL PHARMACOLOGY

12.1 Mechanism of Action

The precise mechanism by which deutetrabenazine exerts its effects in the treatment of tardive dyskinesia and chorea in patients with Huntington’s disease is unknown but is believed to be related to its effect as a reversible depletor of monoamines (such as dopamine, serotonin, norepinephrine, and histamine) from nerve terminals. The major circulating metabolites (c-/β-dihydrodeutetrabenazine [HTBZ] and β-HTBZ) of deutetrabenazine, are reversible inhibitors of VMAT2, resulting in decreased uptake of monoamines into synaptic vesicles and depletion of monoamine stores.

12.2 Pharmacodynamics

Cardiac Electrophysiology

At the maximum recommended dose, AUSTEDO does not prolong the QT interval to any clinically relevant extent. An exposure-response analysis on QTc prolongation from a study in extensive or intermediate (EM) and poor CYP2D6 metabolizers (PM) showed that a clinically-relevant effect can be excluded at exposures following single doses of 24 and 48 mg of AUSTEDO.
**AUSTEDO® (deutetrabenazine) tablets**

**CYP2D6 Inhibitors**

In vitro studies indicate that the α-HTBZ and β-HTBZ metabolites of deutetrabenazine are substrates for CYP2D6. The effect of CYP2D6 inhibition on the pharmacokinetics of deutetrabenazine and its metabolites was studied in 24 healthy subjects following a single 22.5 mg dose of deutetrabenazine given after 8 days of administration of the strong CYP2D6 inhibitor paroxetine 20 mg daily. In the presence of paroxetine, systemic exposure (AUCₚ) of α-HTBZ was 19-fold higher and β-HTBZ was 6.5-fold higher, resulting in approximately 3-fold increase in AUCₚ for total (α+β)-HTBZ. Paroxetine decreased the clearance of α-HTBZ and β-HTBZ metabolites of AUSTEDO with corresponding increases in mean half-life of approximately 1.5-fold and 2.7-fold, respectively. In the presence of paroxetine, Cₚₚₚₚ of α-HTBZ and β-HTBZ were 1.2-fold and 2.2-fold higher, respectively. The effect of moderate or weak CYP2D6 inhibitors such as duloxetine, serotonin, amiodarone, or sertraline on the exposure of deutetrabenazine and its metabolites has not been evaluated.

**Digoxin**

AUSTEDO was not evaluated for interaction with digoxin. Digoxin is a substrate for P-glycoprotein. A study in healthy subjects showed that tetrabenazine (25 mg twice daily for 3 days) did not affect the bioavailability of digoxin, suggesting that at this dose, tetrabenazine does not affect P-glycoprotein in the intestinal tract. In vitro studies also do not suggest that tetrabenazine or its metabolites are P-glycoprotein inhibitors.

### 13 NONCLINICAL TOXICOLOGY

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

**Carcinogenesis**

No carcinogenicity studies were performed with deutetrabenazine.

**Mutagenesis**

Deutetrabenazine and its deuterated α-HTBZ and β-HTBZ metabolites were negative in in vitro (bacterial reverse mutation and chromosome aberration in human peripheral blood lymphocytes) assays in the presence or absence of metabolic activation and in the in vivo micronucleus assay in mice.

**Impairment of Fertility**

The effects of deutetrabenazine on fertility have not been evaluated. Oral administration of deutetrabenazine (doses of 5, 10, or 30 mg/kg/day) to female rats for 3 months resulted in estrous cycle disruption at all doses; the lowest dose tested was similar to the maximum recommended human dose (46 mg/day) on a body surface area (mg/m²) basis. Oral administration of tetrabenazine (doses of 5, 15, or 30 mg/kg/day) to female rats prior to and throughout mating with untreated males resulted in a reduction in fertility, as indicated by a decrease in fertility index, in a dose-dependent manner. The effects occurred, or until a maximal dose of 46 mg per day was reached. The primary efficacy endpoint was the Total Maximal Chorea Score, an item of the Unified Huntington's Disease Rating Scale (UHDRS). On this scale, chorea is rated from 0 to 4 (with 0 representing no chorea) for 7 different parts of the body. The total score ranges from 0 to 28.

#### 14 CLINICAL STUDIES

##### 14.1 Chorea Associated with Huntington's Disease

**Double-Blind, Placebo-Controlled Study**

The efficacy of AUSTEDO as a treatment for chorea associated with Huntington's disease was established primarily in Study 1, a randomized, double-blind, placebo-controlled, multi-center trial conducted in 90 ambulatory patients with manifest chorea associated with Huntington's disease. The diagnosis of Huntington's disease was based on family history, neurological exam, and genetic testing. Treatment duration was 12 weeks, including an 8-week dose titration period and a 4-week maintenance period, followed by a 1-week washout. Patients were not blinded to discontinuation. AUSTEDO was started at 6 mg per day and titrated upward, at weekly intervals, in 6 mg increments to a dose at which satisfactory treatment of chorea was achieved, intolerable side effects occurred, or until a maximal dose of 46 mg per day was reached. The primary efficacy endpoint was the Total Maximal Chorea Score, an item of the Unified Huntington's Disease Rating Scale (UHDRS). On this scale, chorea is rated from 0 to 4 (with 0 representing no chorea) for 7 different parts of the body. The total score ranges from 0 to 28.

**Table 4**

<table>
<thead>
<tr>
<th>Motor Endpoint</th>
<th>AUSTEDO</th>
<th>Placebo</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Chorea Score</td>
<td>N = 222</td>
<td>N = 222</td>
<td></td>
</tr>
<tr>
<td>Change from Baseline</td>
<td>-4.4</td>
<td>-1.9</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

**Figure 2**

The efficacy of AUSTEDO as a treatment for chorea associated with Huntington's disease was established primarily in Study 1, a randomized, double-blind, placebo-controlled, multi-center trial conducted in 90 ambulatory patients with manifest chorea associated with Huntington's disease. The diagnosis of Huntington's disease was based on family history, neurological exam, and genetic testing. Treatment duration was 12 weeks, including an 8-week dose titration period and a 4-week maintenance period, followed by a 1-week washout. Patients were not blinded to discontinuation. AUSTEDO was started at 6 mg per day and titrated upward, at weekly intervals, in 6 mg increments to a dose at which satisfactory treatment of chorea was achieved, intolerable side effects occurred, or until a maximal dose of 46 mg per day was reached. The primary efficacy endpoint was the Total Maximal Chorea Score, an item of the Unified Huntington's Disease Rating Scale (UHDRS). On this scale, chorea is rated from 0 to 4 (with 0 representing no chorea) for 7 different parts of the body. The total score ranges from 0 to 28.

**Figure 3**

The efficacy of AUSTEDO as a treatment for chorea associated with Huntington's disease was established primarily in Study 1, a randomized, double-blind, placebo-controlled, multi-center trial conducted in 90 ambulatory patients with manifest chorea associated with Huntington's disease. The diagnosis of Huntington's disease was based on family history, neurological exam, and genetic testing. Treatment duration was 12 weeks, including an 8-week dose titration period and a 4-week maintenance period, followed by a 1-week washout. Patients were not blinded to discontinuation. AUSTEDO was started at 6 mg per day and titrated upward, at weekly intervals, in 6 mg increments to a dose at which satisfactory treatment of chorea was achieved, intolerable side effects occurred, or until a maximal dose of 46 mg per day was reached. The primary efficacy endpoint was the Total Maximal Chorea Score, an item of the Unified Huntington's Disease Rating Scale (UHDRS). On this scale, chorea is rated from 0 to 4 (with 0 representing no chorea) for 7 different parts of the body. The total score ranges from 0 to 28.
AUSTEDO® (deutetrabenazine) tablets

The mean changes in the AIMS total score by visit are shown in Figure 3. In Study 2, a 12-week, placebo-controlled, flexible-dose trial, adults with tardive dyskinesia (n=113) received daily doses of placebo or AUSTEDO, starting at 12 mg per day with increases allowed in 6-mg increments at 1-week intervals until satisfactory control of dyskinesia was achieved, until intolerable side effects occurred, or until a maximal dose of 48 mg per day was reached. Treatment duration included a 6-week dose titration period and a 6-week maintenance period followed by a 1-week washout. The population was 25 to 75 years old (mean 55 years), 48% male, and 70% Caucasian.Patients were titrated to an optimal dose over 6 weeks. The average dose of AUSTEDO after treatment was 38.3 mg per day. There was no evidence suggesting substantial differences in efficacy across various demographic groups. In Study 2, AIMS total score for patients receiving AUSTEDO demonstrated statistically significant improvement by 3.0 units from baseline to endpoint (Week 12), compared with 16 units in the placebo group with a treatment effect of -1.4 units. Table 5 summarizes the effects of AUSTEDO on tardive dyskinesia based on the AIMS.

Table 5: Improvement in AIMS Total Score in Patients Treated with AUSTEDO in Study 1 and Study 2

<table>
<thead>
<tr>
<th>Study</th>
<th>Treatment Group</th>
<th>Primary Efficacy Measure: AIMS Total Score</th>
<th>Mean Baseline Score (SD)</th>
<th>LS Mean Change from Baseline (SE)</th>
<th>Treatment Effect (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Study 1</td>
<td>AUSTEDO 36 mg* (n=55)</td>
<td></td>
<td>10.13 (3.21)</td>
<td>-3.3 (0.42)</td>
<td>-1.9 (-3.09, -0.79)</td>
</tr>
<tr>
<td>Study 1</td>
<td>AUSTEDO 24 mg (n=49)</td>
<td></td>
<td>9.4 (2.93)</td>
<td>-3.2 (0.45)</td>
<td>-1.8 (-3.00, -0.63)</td>
</tr>
<tr>
<td>Study 1</td>
<td>AUSTEDO 12 mg (n=60)</td>
<td></td>
<td>9.6 (2.40)</td>
<td>-2.1 (0.42)</td>
<td>-0.7 (-1.84, 0.42)</td>
</tr>
<tr>
<td>Study 1</td>
<td>Placebo (n=56)</td>
<td></td>
<td>9.5 (2.77)</td>
<td>-1.4 (0.41)</td>
<td></td>
</tr>
<tr>
<td>Study 2</td>
<td>AUSTEDO (12-48 mg/day)* (n=56)</td>
<td></td>
<td>8.7 (4.14)</td>
<td>-3.0 (0.45)</td>
<td>-1.4 (-2.6, -0.2)</td>
</tr>
<tr>
<td>Study 2</td>
<td>Placebo (n=57)</td>
<td></td>
<td>9.6 (3.78)</td>
<td>-1.8 (0.46)</td>
<td></td>
</tr>
</tbody>
</table>

* Dose that was statistically significantly different from placebo after adjusting for multiplicity.

LS Mean = Least-squares mean; SD = Standard deviation; SE = Standard error; CI = 2-sided 95% confidence interval

**Figure 3:** Least Square Means of Change in AIMS Total Score from Baseline for AUSTEDO Compared to Placebo (Study 1)

**Figure 4:** Percent of Patients with Specified Magnitude of AIMS Total Score Improvement at the End of Week 12 (Study 1)

16 HOW SUPPLIED/STORAGE AND HANDLING

16.1 How Supplied

AUSTEDO tablets are available in the following strengths and packages:

- 6 mg: round, purple-coated tablets, with “SD” over “6” printed in black ink on one side. Bottles of 60 tablets: NDC 68546-170-60.
- 9 mg: round, blue-coated tablets, with “SD” over “9” printed in black ink on one side. Bottles of 60 tablets: NDC 68546-171-60.
- 12 mg: round, beige-coated tablets, with “SD” over “12” printed in black ink on one side. Bottles of 60 tablets: NDC 68546-172-60.

16.2 Storage

Store at 25°C (77°F); excursions permitted to 15°C to 30°C (59°F to 86°F) [see USP Controlled Room Temperature]. Protect from light and moisture.

17 PATIENT COUNSELING INFORMATION

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

Adминистartion Instructions

Advise patients to take AUSTEDO with food. AUSTEDO tablets should be swallowed whole and not chewed, crushed, or broken [see Dosage and Administration (2.1)].

Risk of Depression and Suicide in Patients with Huntington’s Disease

Advise patients, their caregivers, and families that AUSTEDO may increase the risk of depression, worsening depression, and suicidality, and to immediately report any symptoms to a healthcare provider [see Contraindications (4), Warnings and Precautions (5.2)].

SE = Standard error

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XENAZINE® is a trademark of Valeant Pharmaceuticals Luxembourg S.A.R.L.
What is the most important information I should know about AUSTEDO? 
• AUSTEDO can cause serious side effects in people with Huntington’s disease, including:
  ◦ depression
  ◦ suicidal thoughts
  ◦ suicidal actions
• Do not start taking AUSTEDO if you have Huntington’s disease and are depressed (have untreated depression or depression that is not well controlled by medicine) or have suicidal thoughts.
• Pay close attention to any changes, especially sudden changes, in mood, behaviors, thoughts, or feelings. This is especially important when AUSTEDO is started and when the dose is changed.

Call your healthcare provider right away if you become depressed or have any of the following symptoms, especially if they are new, worse, or worry you:
• feel sad or have crying spells
• lose interest in seeing your friends or doing things you used to enjoy
• sleep a lot more or a lot less than usual
• feel unimportant
• feel guilty
• feel hopeless or helpless
• feel more irritable, angry, or aggressive than usual
• feel more or less hungry than usual or notice a big change in your body weight
• have trouble paying attention
• feel tired or sleepy all the time
• have thoughts about hurting yourself or ending your life

What is AUSTEDO? 
AUSTEDO is a prescription medicine that is used to treat:
• the involuntary movements (chorea) of Huntington’s disease. AUSTEDO does not cure the cause of the involuntary movements, and it does not treat other symptoms of Huntington’s disease, such as problems with thinking or emotions.
• movements in the face, tongue, or other body parts that cannot be controlled (tardive dyskinesia).

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

Who should not take AUSTEDO? 
Do not take AUSTEDO if you:
• have Huntington’s disease and are depressed or have thoughts of suicide. See “What is the most important information I should know about AUSTEDO?”
• have liver problems.
• are taking a monoamine oxidase inhibitor (MAOI) medicine. Do not take an MAOI within 14 days after you stop taking AUSTEDO. Do not start AUSTEDO if you stopped taking an MAOI in the last 14 days. Ask your healthcare provider or pharmacist if you are not sure.
• are taking reserpine. Do not take medicines that contain reserpine (such as Serpalan and Renese-R) with AUSTEDO. If your healthcare provider plans to switch you from taking reserpine to AUSTEDO, you must wait at least 20 days after your last dose of reserpine before you start taking AUSTEDO.
• are taking tetrabenazine (Xenazine). If your healthcare provider plans to switch you from tetrabenazine (Xenazine) to AUSTEDO, take your first dose of AUSTEDO on the day after your last dose of tetrabenazine (Xenazine).
• are taking valbenazine (Ingrezza).

Before taking AUSTEDO, tell your healthcare provider about all of your medical conditions, including if you:
• have emotional or mental problems (for example, depression, nervousness, anxiety, anger, agitation, psychosis, previous suicidal thoughts or suicide attempts).
• have liver disease.

AUSTEDO (deutetrabenazine) tablets, for oral use

MEDICATION GUIDE
AUSTEDO® (aw-STED-oh) (deutetrabenazine) tablets, for oral use

- have an irregular heart rhythm or heartbeat (QT prolongation, cardiac arrhythmia) or a heart problem called congenital long QT syndrome.
- have low levels of potassium or magnesium in your blood (hypokalemia or hypomagnesemia).
- have breast cancer or a history of breast cancer.
- are pregnant or plan to become pregnant. It is not known if AUSTEDO can harm your unborn baby.
- are breastfeeding or plan to breastfeed. It is not known if AUSTEDO passes into breast milk.

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

Taking AUSTEDO with certain other medicines may cause side effects. Do not start any new medicines while taking AUSTEDO without talking to your healthcare provider first.

How should I take AUSTEDO? 
• Take AUSTEDO exactly as your healthcare provider tells you to take it.
• Take AUSTEDO by mouth and with food.
• Swallow AUSTEDO tablets whole with water. Do not chew, crush, or break AUSTEDO tablets before swallowing. If you cannot swallow AUSTEDO tablets whole, tell your healthcare provider. You may need a different medicine.
• If your dose of AUSTEDO is 12 mg or more each day, take AUSTEDO tablets 2 times a day in equal doses with food.
• Your healthcare provider will increase your dose of AUSTEDO each week. Do not take another dose until you talk to your healthcare provider.
• Tell your healthcare provider if you stop taking AUSTEDO for more than 1 week. Do not take another dose until you talk to your healthcare provider.

What should I avoid while taking AUSTEDO? 
Sleepiness (sedation) is a common side effect of AUSTEDO. While taking AUSTEDO, do not drive a car or operate dangerous machinery until you know how AUSTEDO affects you. Drinking alcohol and taking other drugs that may also cause sleepiness while you are taking AUSTEDO may increase any sleepiness caused by AUSTEDO.

What are the possible side effects of AUSTEDO? 
AUSTEDO can cause serious side effects, including:
• Depression and suicidal thoughts or actions in people with Huntington’s disease. See “What is the most important information I should know about AUSTEDO?”
• Irregular heartbeat (QT prolongation). AUSTEDO increases your chance of having certain changes in the electrical activity in your heart. These changes can lead to a dangerous abnormal heartbeat. Taking AUSTEDO with certain medicines may increase this chance.
• Neuroleptic Malignant Syndrome (NMS). Call your healthcare provider right away and go to the nearest emergency room if you develop these signs and symptoms that do not have another obvious cause:
  ◦ high fever
  ◦ problems thinking
  ◦ increased sweating
  ◦ stiff muscles
  ◦ very fast or uneven heartbeat
• Restlessness. You may get a condition where you feel a strong urge to move. This is called akathisia.
• Parkinsonism. Symptoms of parkinsonism include: slight shaking, body stiffness, trouble moving, trouble keeping your balance, or falls.

The most common side effects of AUSTEDO in people with Huntington’s disease include:
• sleepiness (sedation)
• diarrhea
• tiredness
• dry mouth

continued
The most common side effects of AUSTEDO in people with tardive dyskinesia include:
- inflammation of the nose and throat (nasopharyngitis)
- problems sleeping (insomnia)
These are not all the possible side effects of AUSTEDO. Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

How should I store AUSTEDO?
- Store AUSTEDO tablets at room temperature, between 68°F to 77°F (20°C to 25°C).
- Keep the bottle tightly closed to protect AUSTEDO from light and moisture.
Keep AUSTEDO tablets and all medications out of reach of children.

General information about the safe and effective use of AUSTEDO.
Medicines are sometimes prescribed for purposes other than those listed in a Medication Guide. Do not use AUSTEDO for a condition for which it was not prescribed. Do not give AUSTEDO to other people, even if they have the same symptoms you have. It may harm them. You can ask your pharmacist or healthcare provider for information about AUSTEDO that is written for health professionals.

What are the ingredients in AUSTEDO?
**Active ingredient:** deutetrabenazine
**Inactive ingredients:** ammonium hydroxide, black iron oxide, n-butyl alcohol, butylated hydroxyanisole, butylated hydroxytoluene, magnesium stearate, mannitol, microcrystalline cellulose, polyethylene glycol, polyethylene oxide, polysorbate 80, polyvinyl alcohol, povidone, propylene glycol, shellac, talc, titanium dioxide, and FD&C blue #2 lake. The 6 mg tablets also contain FD&C red #40 lake. The 12 mg tablets also contain FD&C yellow #6 lake.

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AUSMG-005
For more information, go to www.AUSTEDO.com or call 1-888-483-8279.

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