

## PRODUCT MONOGRAPH

<sup>Pr</sup> **ACH-Olmesartan HCTZ**

Olmesartan Medoxomil and Hydrochlorothiazide Tablets

20 mg / 12.5 mg, 40 mg / 12.5 mg, and 40 mg / 25 mg

Angiotensin II AT<sub>1</sub> Receptor Blocker – Diuretic

Accord Healthcare Inc.  
3535 boul. St. Charles, Suite 704  
Kirkland, QC, H9H 5B9  
Canada

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**Pr ACH-Olmesartan HCTZ**  
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**PART I: HEALTH PROFESSIONAL INFORMATION**

**SUMMARY PRODUCT INFORMATION**

<b>Route of Administration</b>	<b>Dosage Form / Strength</b>	<b>Nonmedicinal Ingredients</b>
Oral	Tablet / 20 mg / 12.5 mg, 40 mg / 12.5 mg, and 40 mg / 25 mg	hydroxypropylcellulose, lactose monohydrate, microcrystalline cellulose, low-substituted hydroxypropylcellulose, magnesium stearate, hydroxypropyl methylcellulose, polyethylene glycol, titanium dioxide, talc, iron oxide yellow and iron oxide red.

**INDICATIONS AND CLINICAL USE**

ACH-Olmesartan HCTZ is indicated for the treatment of mild to moderate essential hypertension in patients for whom combination therapy is appropriate.

ACH-Olmesartan HCTZ is not indicated for initial therapy (see **DOSAGE AND ADMINISTRATION**).

**Geriatrics (≥65 years of age):** Reported clinical experience has not identified differences in responses between elderly and younger patients, however, greater sensitivity of some older individuals cannot be ruled out (see **DOSAGE AND ADMINISTRATION**).

**Pediatrics (<18 years of age):** The safety and effectiveness in pediatric patients have not been established.

**CONTRAINDICATIONS**

- Patients who are hypersensitive to this drug or to any ingredient in the formulation or component of the container. For a complete listing, see the **DOSAGE FORMS, COMPOSITION AND PACKAGING** section of the product monograph.
- Because of the hydrochlorothiazide component, ACH-Olmesartan HCTZ (olmesartan medoxomil and hydrochlorothiazide) is contraindicated in patients with anuria, and in patients who are hypersensitive to other sulfonamide-derived drugs.
- Concomitant use of angiotensin receptor antagonists (ARBs) -including the "*olmesartan medoxomil*" component of ACH-Olmesartan HCTZ, with aliskiren-containing drugs in patients with diabetes mellitus (type 1 or type 2) or moderate to severe renal impairment (GFR < 60 ml / min / 1.73m<sup>2</sup>) is contraindicated (see **WARNINGS and PRECAUTIONS, Dual Blockade of the Renin-Angiotensin System (RAS) and Renal, and DRUG INTERACTIONS, Dual Blockade of the Renin-Angiotensin-System (RAS) with ARBs, ACEIs or aliskiren-containing drugs**).

## WARNINGS AND PRECAUTIONS

### Serious Warnings and Precautions

When used in pregnancy, angiotensin receptor (AT<sub>1</sub>) blockers (ARB) can cause injury or even death of the developing fetus. When pregnancy is detected, ACH-Olmesartan HCTZ (olmesartan medoxomil and hydrochlorothiazide) should be discontinued as soon as possible (see **WARNINGS AND PRECAUTIONS, Special Populations**).

### **Carcinogenesis and Mutagenesis**

**Non-melanoma skin cancer:** An increased risk of non-melanoma skin cancer (NMSC) [basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) of the skin] after hydrochlorothiazide therapy was reported in some epidemiological studies. The risk may be higher with increasing cumulative use (see ADVERSE REACTIONS, Post Market Adverse Drug Reactions). The photosensitizing action of hydrochlorothiazide may be a possible mechanism for NMSC (see TOXICOLOGY, Carcinogenicity – Hydrochlorothiazide).

Patients taking hydrochlorothiazide should be informed of the potential risk of NMSC. They should be advised to regularly check their skin for new lesions as well as changes to existing ones, and to promptly report any suspicious skin lesions. Patients should also be advised to limit exposure to sunlight, to avoid the use of indoor tanning equipment, and to use adequate protection (e.g. a broad spectrum sunscreen with a SPF of 30 or higher, clothing, and a hat) when exposed to sunlight or UV light to minimize the risk of skin cancer.

Alternatives to hydrochlorothiazide may be considered for patients who are at a particularly high risk for NMSC (e.g., light coloured skin, known personal or family history of skin cancer, ongoing immunosuppressive therapy, etc.) (see ADVERSE REACTIONS, Post Market Adverse Drug Reactions).

### **Cardiovascular**

**Hypotension in Volume- or Salt- Depleted Patients:** In patients with an activated renin-angiotensin system, such as volume- or salt-depleted patients (e.g., those being treated with high doses of diuretics), symptomatic hypotension may occur after initiation of treatment with ACH-Olmesartan HCTZ. Treatment should start under close medical supervision. Similar considerations apply to patients with ischemic heart or cerebrovascular disease, in whom an excessive fall in blood pressure could result in myocardial infarction or cerebrovascular accident. If hypotension does occur, the patient should be placed in the supine position and, if necessary, given an intravenous infusion of normal saline (see **DOSAGE AND ADMINISTRATION**). When electrolyte and fluid imbalances have been corrected, therapy usually can be continued without difficulty. A transient hypotensive response is not a contraindication to further treatment.

**Valvular Stenosis:** there is concern on theoretical grounds that patients with aortic stenosis might be at a particular risk of decreased coronary perfusion, because they do not develop as much afterload reduction.

### **Dual blockade of the Renin-Angiotensin System (RAS)**

There is evidence that co-administration of angiotensin receptor antagonists (ARBs), such as the “*olmesartan medoxomil*” component of ACH-Olmesartan HCTZ, or of angiotensin-converting-enzyme inhibitors (ACEIs) with aliskiren increases the risk of hypotension, syncope, stroke, hyperkalemia and deterioration of renal function, including renal failure, in patients with diabetes mellitus (type 1 or type 2) and/or moderate to severe renal impairment (GFR < 60 ml / min / 1.73m<sup>2</sup>). Therefore, the use of ACH-Olmesartan HCTZ in combination with aliskiren-containing drugs is contraindicated in these patients (see **CONTRAINDICATIONS**). Further, co-administration of ARBs, including the “*olmesartan medoxomil*” component of ACH-Olmesartan HCTZ, with other agents blocking the RAS, such as ACEIs or aliskiren-containing drugs, is generally not recommended in other patients, since such treatment has been associated with an increased incidence of severe hypotension, renal failure and hyperkalemia.

### **Endocrine and Metabolism**

Periodic determinations of serum electrolytes to detect possible electrolyte imbalance should be performed at appropriate intervals. All patients receiving thiazide therapy should be observed for clinical signs of fluid or electrolyte imbalance: hyponatremia, hypochloremic alkalosis and hypokalemia. Serum and urine electrolyte determinations are important when the patient is vomiting excessively or receiving parenteral fluids. Warning signs or symptoms of fluid and electrolyte imbalance, irrespective of cause, include dryness of mouth, thirst, weakness, lethargy, drowsiness, restlessness, confusion, seizures, muscle pains or cramps, muscular fatigue, hypotension, oliguria, tachycardia and gastrointestinal disturbances such as nausea and vomiting.

Hypokalemia may develop, especially with brisk diuresis, when severe cirrhosis is present, or after prolonged therapy.

ACH-Olmesartan HCTZ contains olmesartan, a drug that inhibits the renin-angiotensin system (RAS). Drugs that inhibit the RAS can cause hyperkalaemia. Monitor serum electrolytes periodically.

Interference with adequate oral electrolyte intake will also contribute to hypokalemia. Hypokalemia may cause cardiac arrhythmia and may also sensitize or exaggerate the response of the heart to the toxic effects of digitalis (e.g., increased ventricular irritability).

Although any chloride deficit during thiazide therapy is generally mild and usually does not require specific treatment except under extraordinary circumstances (as in liver disease or renal disease), chloride replacement may be required in the treatment of metabolic alkalosis.

Dilutional hyponatremia may occur in edematous patients in hot weather. Appropriate therapy is water restriction rather than administration of salt, except in rare instances, when the hyponatremia is life threatening. In actual salt depletion, appropriate replacement is the therapy of choice.

Thiazides have been shown to increase the urinary excretion of magnesium; this may result in hypomagnesemia.

Hyperuricemia may occur or acute gout may be precipitated in certain patients receiving thiazide

therapy.

Increases in cholesterol and triglyceride levels may be associated with thiazide diuretic therapy.

Thiazides may decrease urinary calcium excretion. Thiazides may cause intermittent and slight elevation of serum calcium in the absence of known disorders of calcium metabolism. Marked hypercalcemia may be evidence of hidden hyperparathyroidism. Thiazides should be discontinued before carrying out tests for parathyroid function.

Thiazides may decrease PBI levels without signs of thyroid disturbance.

Hyperglycemia may occur with thiazide diuretics. Insulin or oral hypoglycemic agents requirements in diabetic patients may be altered and latent diabetes mellitus may become manifest during thiazide diuretic therapy.

### **Gastrointestinal**

**Sprue-like Enteropathy:** Severe, chronic diarrhea with substantial weight loss has been reported in patients taking olmesartan months to years after drug initiation. Intestinal biopsies of patients often demonstrated villous atrophy. If a patient develops these symptoms during treatment with olmesartan and no other etiology is identified, discontinue ACH-Olmesartan HCTZ.

### **Hepatic / Biliary / Pancreatic**

No adjustment of dosage is required for patients with mild hepatic impairment. Data is lacking with respect to the use of 20 mg and 40 mg olmesartan medoxomil; therefore a lower starting dose is recommended in patients with moderate liver disease, and the maximum dose of 20 mg / 12.5 mg olmesartan medoxomil-hydrochlorothiazide daily should not be exceeded. Care should be exercised in patients with liver disease, especially in those patients with biliary obstructive disorders, as the majority of olmesartan is eliminated in the bile. No information is available in patients with severe liver disease; therefore, use of olmesartan medoxomil in this group of patients is not recommended (see **ACTION AND CLINICAL PHARMACOLOGY, Pharmacokinetics**).

Thiazides should be used with caution in patients with impaired hepatic function or progressive liver disease, since minor alterations of fluid and electrolyte balance may precipitate hepatic coma.

### **Renal**

**Impaired Renal Function:** As a consequence of inhibiting the renin-angiotensin-aldosterone system, changes in renal function may be anticipated in susceptible individuals treated with olmesartan medoxomil. In patients whose renal function may depend upon the activity of the renin-angiotensin-aldosterone system (e.g., patients with severe congestive heart failure), treatment with angiotensin converting enzyme inhibitors and angiotensin receptor antagonists has been associated with oliguria and / or progressive azotemia and rarely, acute renal failure and/or death. Similar results may be anticipated in patients treated with olmesartan medoxomil (see **ACTION AND CLINICAL PHARMACOLOGY, Special Populations**).

The use of ARBs – including including the “*olmesartan medoxomil*” component of ACH-Olmesartan HCTZ, or ACEIs with aliskiren-containing drugs is contraindicated in patients with moderate to severe renal impairment (GFR < 60 ml / min / 1.73m<sup>2</sup>). (See **CONTRAINDICATIONS** and **DRUG INTERACTIONS, Dual Blockade of the Renin-Angiotensin-System (RAS) with ARBs, ACEIs, or aliskiren-containing drugs**).

In studies of ACE inhibitors in patients with unilateral or bilateral renal artery stenosis, increases in serum creatinine or blood urea nitrogen (BUN) have been reported. There has been no long-term use of olmesartan medoxomil in patients with unilateral or bilateral renal artery stenosis, but similar results may be expected.

Thiazides should be used with caution in severe renal disease. In patients with renal disease, thiazides may precipitate azotemia. Cumulative effects of the drug may develop in patients with impaired renal function.

If progressive renal impairment becomes evident consider withholding or discontinuing diuretic therapy.

### **Sensitivity / Resistance**

**Hypersensitivity:** Anaphylactic reactions have been reported very rarely in patients treated with olmesartan.

Hypersensitivity reactions to hydrochlorothiazide may occur in patients with or without a history of allergy or bronchial asthma, but are more likely in patients with such a history.

Thiazide diuretics have been reported to cause exacerbation or activation of systemic lupus erythematosus.

**Photosensitivity:** Photosensitivity reactions have been reported with the use of thiazide diuretics. If photosensitivity reactions occur during treatment with hydrochlorothiazide-containing drugs, treatment should be stopped.

### **Acute Myopia and Secondary Angle-Closure Glaucoma**

Hydrochlorothiazide, a sulfonamide, can cause an idiosyncratic reaction, resulting in acute transient myopia and acute angle-closure glaucoma. Symptoms include acute onset of decreased visual acuity or ocular pain and typically occur within hours to weeks of drug initiation. Untreated acute angle-closure glaucoma can lead to permanent vision loss. The primary treatment is to discontinue hydrochlorothiazide as rapidly as possible. Prompt medical or surgical treatments may need to be considered if the intraocular pressure remains uncontrolled. Risk factors for developing acute angle-closure glaucoma may include a history of sulfonamide or penicillin allergy.

### **Special Populations**

**Pregnant Women:** drugs that act directly on the renin-angiotensin-aldosterone system (RAAS) can cause fetal and neonatal morbidity and death when administered to pregnant women. When

pregnancy is detected, ACH-Olmesartan HCTZ should be discontinued as soon as possible.

The use of ARBs is not recommended during pregnancy. Epidemiological evidence regarding the risk of teratogenicity following exposure to angiotensin converting enzyme inhibitors (another class of therapeutic products interfering with the RAAS) during the first trimester of pregnancy has not been conclusive; however a small increase in risk cannot be excluded. Given the current evidence available on the risk with ARB, similar risks may exist for this class of drugs. Patients planning pregnancy should be changed to alternative anti-hypertensive treatments which have an established safety profile for use in pregnancy. When pregnancy is diagnosed, treatment with angiotensin II antagonists should be stopped immediately, and, if appropriate, alternative therapy should be started.

The use of ARBs during the second and third trimesters is known to induce human fetotoxicity (decreased renal function, oligohydramnios, skull ossification retardation) and neonatal toxicity (renal failure, hypotension, hyperkalemia).

Infants with a history of in utero exposure to ARBs should be closely observed for hypotension, oliguria, and hyperkalemia. If oliguria occurs, attention should be directed toward support of blood pressure and renal perfusion. Exchange transfusion or dialysis may be required as a means of reversing hypotension and / or substituting for impaired renal function; however, limited experience with those procedures has not been associated with significant clinical benefit.

It is not known if olmesartan can be removed from the body by hemodialysis.

Thiazides cross the placental barrier and appear in cord blood. The routine use of diuretics in otherwise healthy pregnant women is not recommended and exposes mother and fetus to unnecessary hazard including fetal or neonatal jaundice, thrombocytopenia and possibly other adverse reactions that have occurred in adults.

#### Animal Data

No teratogenic effects were observed when 1.6:1 combinations of olmesartan medoxomil and hydrochlorothiazide were administered to pregnant mice at oral doses up to 1625 mg / kg / day (122 times the maximum recommended human dose [MRHD] on a mg / m<sup>2</sup> basis) or pregnant rats at oral doses up to 1625 mg / kg / day (280 times the MRHD on a mg / m<sup>2</sup> basis). In rats, however, fetal body weights at 1625 mg / kg / day (a toxic, sometimes lethal dose in the dams) were significantly lower than control. The no observed effect dose for developmental toxicity in rats, 162.5 mg / kg / day, is about 28 times, on a mg / m<sup>2</sup> basis, the MRHD of olmesartan medoxomil and hydrochlorothiazide (40 mg olmesartan medoxomil / 25 mg hydrochlorothiazide / day).

**Nursing Women:** It is not known whether olmesartan is excreted in human milk, but olmesartan is secreted at low concentration in the milk of lactating rats. Thiazides appear in human milk. A decision should be made whether to discontinue nursing or discontinue the drug, taking into account the importance of the drug to the mother.

**Pediatrics (<18 years of age):** The safety and effectiveness in pediatric patients have not been established.

**Geriatrics (≥65 years of age):** Reported clinical experience has not identified differences in responses between elderly and younger patients, however, greater sensitivity of some older



individuals cannot be ruled out (see **CLINICAL TRIALS**).

## ADVERSE REACTIONS

### Adverse Drug Reaction Overview

#### *Olmesartan medoxomil-hydrochlorothiazide*

Olmesartan medoxomil-hydrochlorothiazide has been evaluated for safety in 1243 patients treated for essential hypertension. Treatment with olmesartan medoxomil-hydrochlorothiazide was well tolerated, with an incidence of adverse events similar to placebo. Events generally were mild, transient and had no relationship to the dose of olmesartan medoxomil-hydrochlorothiazide.

In the clinical trials, the overall frequency of adverse events was not dose-related. Analysis of gender, age and race groups demonstrated no differences between olmesartan medoxomil-hydrochlorothiazide and placebo-treated patients. The rate of discontinuations due to adverse events in all trials of hypertensive patients was 2.0% (25 / 1243) of patients treated with olmesartan medoxomil-hydrochlorothiazide and 2.0% (7 / 342) of patients treated with placebo. The following potentially serious adverse reactions have been reported with olmesartan medoxomil / olmesartan medoxomil-hydrochlorothiazide in controlled trials: syncope, hypotension.

### Clinical Trial Adverse Drug Reactions

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

In a placebo-controlled clinical trial, the following adverse events were reported with olmesartan medoxomil-hydrochlorothiazide in >1% of patients (Table 1).

<b>Table 1: Adverse Events<sup>a</sup> Occurring &gt;1% in Placebo-controlled Cohort</b>				
	<b>Total Placebo ALONE</b>	<b>Total HCTZ ALONE</b>	<b>Total Olmesartan Medoxomil ALONE</b>	<b>Total Olmesartan Medoxomil + HCTZ</b>
	(N = 42)	(N = 88)	(N = 125)	(N = 247)
<b>System Organ Class (SOC)</b>				
<b>MedDRA Preferred Term</b>	N (%)	N (%)	N (%)	N (%)
<b>Ear and labyrinth disorders</b>				
Ear disorder	0 (0.0%)	0 (0.0%)	0 (0.0%)	5 (2.0%)
<b>Gastrointestinal disorders</b>				
Nausea	0 (0.0%)	1 (1.1%)	2 (1.6%)	7 (2.8%)
Abdominal pain	1 (2.4%)	1 (1.1%)	4 (3.2%)	5 (2.0%)
Dyspepsia	0 (0.0%)	4 (4.5%)	2 (1.6%)	5 (2.0%)
Diarrhea	1 (2.4%)	2 (2.3%)	4 (3.2%)	4 (1.6%)
Gastroenteritis	1 (2.4%)	0 (0.0%)	0 (0.0%)	3 (1.2%)

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	<b>Total Placebo ALONE</b>	<b>Total HCTZ ALONE</b>	<b>Total Olmesartan Medoxomil ALONE</b>	<b>Total Olmesartan Medoxomil + HCTZ</b>
<b>General disorders and administration site conditions</b>				
Fatigue	0 (0.0%)	1 (1.1%)	3 (2.4%)	5 (2.0%)
Influenza like illness	0 (0.0%)	1 (1.1%)	1 (0.8%)	3 (1.2%)
<b>Immune system disorders</b>				
Hypersensitivity	0 (0.0%)	1 (1.1%)	1 (0.8%)	3 (1.2%)
<b>Infections and Infestations</b>				
Upper respiratory tract infection	0 (0.0%)	6 (6.8%)	8 (6.4%)	16 (6.5%)
Urinary tract infections	1 (2.4%)	1 (1.1%)	1 (0.8%)	8 (3.2%)
Pharyngitis	0 (0.0%)	1 (1.1%)	1 (0.8%)	4 (1.6%)
Rhinitis	2 (4.8%)	0 (0.0%)	3 (2.4%)	4 (1.6%)
Sinusitis	1 (2.4%)	2 (2.3%)	3 (2.4%)	3 (1.2%)
<b>Injury, poisoning and procedural complications</b>				
Injury	0 (0.0%)	3 (3.4%)	1 (0.8%)	6 (2.4%)
<b>Metabolism and nutrition disorders</b>				
Hyperuricemia	1 (2.4%)	2 (2.3%)	0 (0.0%)	10 (4.0%)
Hyperglycemia	1 (2.4%)	2 (2.3%)	0 (0.0%)	5 (2.0%)
Hyperlipemia	0 (0.0%)	1 (1.1%)	1 (0.8%)	4 (1.6%)
BUN increased	0 (0.0%)	0 (0.0%)	0 (0.0%)	4 (1.6%)
<b>Musculoskeletal and connective tissue disorders</b>				
Back pain	1 (2.4%)	2 (2.3%)	3 (2.4%)	5 (2.0%)
Myalgia	0 (0.0%)	1 (1.1%)	4 (3.2%)	5 (2.0%)
<b>Nervous system disorders</b>				
Dizziness	1 (2.4%)	7 (8.0%)	1 (0.8%)	23 (9.3%)
Headache	3 (7.1%)	4 (4.5%)	11 (8.8%)	13 (5.3%)
<b>Renal and urinary disorders</b>				
Hematuria	0 (0.0%)	0 (0.0%)	0 (0.0%)	6 (2.4%)
Pyuria	0 (0.0%)	1 (1.1%)	1 (0.8%)	4 (1.6%)
Urine analysis abnormal	0 (0.0%)	0 (0.0%)	0 (0.0%)	4 (1.6%)
<b>Respiratory, thoracic and mediastinal disorders</b>				
Cough	0 (0.0%)	0 (0.0%)	2 (1.6%)	5 (2.0%)
<b>Vascular disorders</b>				
Hypotension	0 (0.0%)	0 (0.0%)	0 (0.0%)	3 (1.2%)
<sup>a</sup> Adverse events reported in >1% of patients in the Total Olmesartan Medoxomil + HCTZ treatment group.				

Other adverse events that have been reported with an incidence of greater than 1.0%, whether or not attributed to treatment, in the more than 1200 hypertensive patients treated with olmesartan medoxomil-hydrochlorothiazide in controlled or open-label trials are listed below.

Gastrointestinal disorders: abdominal pain, dyspepsia, diarrhea.

General disorders and administration site conditions: chest pain, edema peripheral.

Infections and infestations: gastroenteritis.

Investigations: alanine aminotransferase increased, aspartate aminotransferase increased, creatine phosphokinase increased, gamma-glutamyltransferase increased.

Musculoskeletal and connective tissue disorders: arthritis, arthralgia, back pain, myalgia.

Nervous system disorders: vertigo.

Renal and urinary disorders: hematuria.

Respiratory, thoracic and mediastinal disorders: cough.

Skin and subcutaneous tissue disorders: rash.

### **Less Common Clinical Trial Adverse Drug Reactions (<1%)**

Facial edema was reported in 2 / 1243 patients receiving olmesartan medoxomil-hydrochlorothiazide. Angioedema has been reported with angiotensin II receptor antagonists.

### **Abnormal Hematologic and Clinical Chemistry Findings**

In controlled clinical trials, clinically important changes in standard laboratory parameters were rarely associated with administration of olmesartan medoxomil-hydrochlorothiazide.

*Liver Functions Tests:* elevations of liver enzymes and/or serum bilirubin were observed infrequently.

	<u>Placebo</u>	<u>HCTZ</u>	<u>Olmesartan Medoxomil</u>	<u>Olmesartan Medoxomil + HCTZ</u>
	(n=42)	(n=88)	(n=125)	(n=247)
CPK increased	2 (4.8%)	2 (2.3%)	3 (2.4%)	4 (1.6%)
γGT increased	1 (2.4%)	1 (1.1%)	3 (2.4%)	3 (1.2%)
ALT increased	2 (4.8%)	1 (1.1%)	3 (2.4%)	3 (1.2%)
AST increased	1 (2.4%)	1 (1.1%)	3 (2.4%)	3 (1.2%)

*Creatinine, Blood Urea Nitrogen:* Increases in blood urea nitrogen (BUN) and serum creatinine of >50% were observed in 1.3% of patients. No patients were discontinued from clinical trials of olmesartan medoxomil-hydrochlorothiazide due to increased BUN or creatinine.

*Hemoglobin and Hematocrit:* A greater than 20% decrease in hemoglobin and hematocrit was observed in 0.0% and 0.4% (one patient), respectively, of olmesartan medoxomil-hydrochlorothiazide patients, compared with 0.0% and 0.0%, respectively, in placebo-treated patients. No patients were discontinued due to anemia.

### **Post-Market Adverse Drug Reactions**

Other adverse events reported rarely in post-marketing use include: asthenia, angioedema, vomiting, hyperkalemia, rhabdomyolysis, renal failure acute, blood creatinine increased, alopecia, pruritus, urticaria, palpitations, syncope, blood uric acid increased and sprue-like enteropathy.

Anaphylactic reactions have been reported very rarely in patients treated with olmesartan.

In the Randomised Olmesartan And Diabetes Microalbuminuria Prevention (ROADMAP) clinical study including 4447 patients with type 2 diabetes, normo-albuminuria and at least one additional cardiovascular risk factor, cardiovascular events occurred in 96 patients (4.3%) with olmesartan

and in 94 patients (4.2%) with placebo. The incidence of cardiovascular mortality was higher with olmesartan compared to placebo treatment (15 patients (0.66%) vs. 3 patients (0.14%) (HR=4.94; 95% CI=1.43-17.06)). The patient population at increased risk had preexisting coronary artery disease.

### **Non-melanoma skin cancer**

Some pharmacoepidemiological studies have suggested a higher risk of squamous cell carcinoma (SCC) and basal cell carcinoma (BCC) of the skin with increasing use of hydrochlorothiazide. A systematic review and meta-analysis undertaken by Health Canada suggested that, with important uncertainty, the use of hydrochlorothiazide for several years (>3 years) could lead to:

- 122 additional cases (95% CI, from 112 to 133 additional cases) of SCC per 1000 treated patients compared with non-use of hydrochlorothiazide (meta-analysis of 3 observational studies);
- 31 additional cases (95% CI, from 24 to 37 additional cases) of BCC per 1000 treated patients compared with non-use of hydrochlorothiazide (meta-analysis of 2 observational studies).

## **DRUG INTERACTIONS**

### **Drug-Drug Interactions**

#### **Olmesartan medoxomil-hydrochlorothiazide**

*Non-Steroidal Anti-Inflammatory Agents including Selective Cyclooxygenase-2 Inhibitors (COX-2 Inhibitors)*

In patients who are elderly, volume-depleted (including those on diuretic therapy), or with compromised renal function, co-administration of NSAIDs, including selective COX-2 inhibitors, with angiotensin II receptor antagonists, including olmesartan, may result in deterioration of renal function, including possible acute renal failure. These effects are usually reversible. Renal function should be monitored periodically in patients receiving olmesartan and NSAID therapy.

The antihypertensive effect of angiotensin II receptor antagonists, including olmesartan may be attenuated by NSAIDs including selective COX-2 inhibitors

The administration of a non-steroidal anti-inflammatory agent can reduce the diuretic, natriuretic and antihypertensive effects of loop, potassium-sparing and thiazide diuretics. Therefore, when ACH-Olmesartan HCTZ and NSAID agents are used concomitantly, the patients should be observed closely to determine if the desired effect of the diuretic is obtained.

#### **Olmesartan medoxomil**

*Diuretics*

Patients on diuretics, and especially those in whom diuretic therapy was recently instituted, may occasionally experience an excessive reduction in blood pressure after initiation of therapy with olmesartan. The possibility of symptomatic hypotension with the use of olmesartan can be minimized by discontinuing the diuretic prior to initiation of treatment (see **WARNINGS AND PRECAUTIONS, Cardiovascular, Hypotension in Volume- or Salt-Depleted Patients**). No drug interaction of clinical significance has been identified with thiazide diuretics.

*Warfarin*

There was no effect on either the pharmacokinetics or pharmacodynamics of warfarin when co-administered with olmesartan medoxomil in healthy volunteers.

#### *Digoxin*

No pharmacokinetics or pharmacodynamics effects were reported when olmesartan medoxomil was co-administered with digoxin in healthy volunteers.

#### *Antacids*

The bioavailability of olmesartan was not significantly altered when co-administered with antacids [Al(OH)<sub>3</sub> / Mg(OH)<sub>2</sub>].

#### *Cytochrome P450 Enzyme System*

Unlike some other angiotensin II receptor blockers, olmesartan medoxomil is not metabolized by cytochrome P450 enzymes. Interactions with drugs that inhibit, induce or are metabolized by these enzymes are not expected.

#### *Lithium Salts*

As with other drugs which eliminate sodium, lithium clearance may be reduced in the presence of olmesartan. Therefore, serum lithium levels should be monitored carefully if lithium salts are to be administered with olmesartan medoxomil.

#### *Dual blockage of the Renin-Angiotensin-System (RAS) with ARBs, ACEIs or aliskiren-containing drugs*

Dual Blockade of the Renin-Angiotensin-System (RAS) with ARBs, ACEIs or aliskiren-containing drugs is contraindicated in patients with diabetes and / or renal impairment, and is generally not recommended in other patients, since such treatment has been associated with an increased incidence of severe hypotension, renal failure and hyperkalemia (See **CONTRAINDICATIONS** and **WARNINGS AND PRECAUTIONS, Dual Blockade of the Renin-Angiotensin-System (RAS)**).

#### **Hydrochlorothiazide**

When administered concurrently the following drugs may interact with thiazide diuretics:

<b>Proper Name</b>	<b>Ref.</b>	<b>Effect</b>	<b>Clinical comment</b>
Agents Increasing Serum Potassium	T	Concomitant use of potassium-sparing diuretics (e.g., spironolactone, triamterene, amiloride), potassium supplements, or salt substitutes containing potassium may lead to increase in serum potassium.	Since olmesartan decreases the production of aldosterone, potassium-sparing diuretics or potassium supplements should be given only for documented hypokalemia and with frequent monitoring of serum potassium when olmesartan medoxomil therapy is initiated. Potassium-containing salt substitutes should also be used with caution. Concomitant thiazide diuretic use may attenuate any effect that olmesartan may have on serum potassium.
Alcohol, barbiturates, or narcotics	C	Potential of orthostatic hypotension may occur.	Avoid alcohol, barbiturates or narcotics, especially with initiation of therapy.

Proper Name	Ref.	Effect	Clinical comment
Amphotericin B	T	Amphotericin B increases the risk of hypokalemia induced by thiazide diuretics.	Monitor serum potassium level.
Antidiabetic agents (e.g. insulin and oral hypoglycemic agents)	CT	Thiazide-induced hyperglycemia may compromise blood sugar control. Depletion of serum potassium augments glucose intolerance.	Monitor glycemic control, supplement potassium if necessary, to maintain appropriate serum potassium levels, and adjust diabetes medications as required.
Antihypertensive drugs	CT	Hydrochlorothiazide may potentiate the action of other antihypertensive drugs (e.g. guanethidine, methyldopa, betablockers, vasodilators, calcium channel blockers, ACEI, ARB, and direct renin inhibitors).	
Antineoplastic drugs, including cyclophosphamide and methotrexate	C	Concomitant use of thiazide diuretics may reduce renal excretion of cytotoxic agents and enhance their myelosuppressive effects.	Hematological status should be closely monitored in patients receiving this combination. Dose adjustment of cytotoxic agents may be required.
Bile acid sequestrants, eg. cholestyramine	CT	Bile acid sequestrants bind thiazide diuretics in the gut and impair gastrointestinal absorption by 43-85%. Administration of thiazide 4 hours after a bile acid sequestrant reduced absorption of hydrochlorothiazide by 30-35%.	Give thiazide 2-4 hours before or 6 hours after the bile acid sequestrant. Maintain a consistent sequence of administration. Monitor blood pressure, and increase dose of thiazide, if necessary.
Calcium and vitamin D supplements	C	Thiazides decrease renal excretion of calcium and increase calcium release from bone.	Monitor serum calcium, especially with concomitant use of high doses of calcium supplements. Dose reduction or withdrawal of calcium and / or vitamin D supplements may be necessary.
Carbamazepine	C	Carbamazepine may cause clinically significant hyponatremia. Concomitant use with thiazide diuretics may potentiate hyponatremia.	Monitor serum sodium levels. Use with caution.
Corticosteroids, and adrenocorticotrophic hormone (ACTH)	T	Intensified electrolyte depletion, particularly hypokalemia, may occur.	Monitor serum potassium, and adjust medications, as required.
Digoxin	CT	Thiazide-induced electrolyte disturbances, i.e. hypokalemia, hypomagnesemia, increase the risk of digoxin toxicity, which may lead to fatal arrhythmic events.	Concomitant administration of hydrochlorothiazide and digoxin requires caution. Monitor electrolytes and digoxin levels closely. Supplement potassium or adjust doses of digoxin or thiazide, as required.

Proper Name	Ref.	Effect	Clinical comment
Drugs that alter GI motility, i.e., anti-cholinergic agents, such as atropine and prokinetic agents, such as metoclopramide, domperidone	CT, T	Bioavailability of thiazide diuretics may be increased by anticholinergic agents due to a decrease in gastrointestinal motility and gastric emptying. Conversely, prokinetic drugs may decrease the bioavailability of thiazide diuretics.	Dose adjustment of thiazide may be required.
Gout medications (allopurinol, uricosurics, xanthine oxidase inhibitors)	T, RC	Thiazide-induced hyperuricemia may compromise control of gout by allopurinol and probenecid. The co-administration of hydrochlorothiazide and allopurinol may increase the incidence of hypersensitivity reactions to allopurinol.	Dosage adjustment of gout medications may be required.
Lithium	CT	Thiazide diuretics reduce the renal clearance of lithium and add a high risk of lithium toxicity.	Concomitant use of thiazide diuretics with lithium is generally not recommended. If such use is deemed necessary, reduce lithium dose by 50% and monitor lithium levels closely.
Nonsteroidal anti-inflammatory drugs (NSAID)	CT	NSAID-related retention of sodium and water antagonizes the diuretic and antihypertensive effects of thiazides. NSAID-induced inhibition of renal prostaglandins leading to decreases of renal blood flow, along with thiazide-induced decreases in GFR may lead to acute renal failure. Patients with heart failure may be at particular risk.	If combination use is necessary, monitor renal function, serum potassium, and blood pressure closely. Dose adjustments may be required.
Pressor Amines (e.g., Norepinephrine)	T	In the presence of diuretics, possible decreased response to pressor amines may occur but the effect is not sufficient to preclude their use.	
Selective serotonin reuptake inhibitors (SSRIs, e.g. citalopram, escitalopram, sertraline)	T, C	Concomitant use with thiazide diuretics may potentiate hyponatremia.	Monitor serum sodium levels. Use with caution.
Skeletal muscle relaxants of the curare family, eg., tubocurare	C	Thiazide drugs may increase the responsiveness of some skeletal muscle relaxants, such as curare derivatives.	
Topiramate	CT	Additive hypokalemia. Possible thiazide-induced increase in topiramate serum concentrations.	Monitor serum potassium and topiramate levels. Use potassium supplements, or concentrations. adjust topiramate dose as necessary.

C=Case Study; RCS=Retrospective Cohort Study; CT=Clinical Trial; T=Theoretical

### **Drug-Food Interactions**

ACH-Olmesartan HCTZ may be administered with or without food.

### **Drug-Herb Interactions**

Interactions with herbal products have not been established.

### **Drug-Laboratory Interactions**

Interactions with laboratory tests have not been established.

## **DOSAGE AND ADMINISTRATION**

### **Dosing Considerations**

- ACH-Olmesartan HCTZ (olmesartan medoxomil and hydrochlorothiazide) is not for initial therapy.
- The dosage must be individualized.
- To minimize dose-independent side effects, it is usually appropriate to begin combination therapy only after a patient has failed to achieve the desired effect with monotherapy.
- The dose of ACH-Olmesartan HCTZ should be determined by the titration of the individual components.

### **Recommended Dose and Dosage Adjustment**

#### **Replacement Therapy**

Once the patient has been stabilized on the individual components as described below, ACH-Olmesartan HCTZ may be substituted if the doses on which the patient was stabilized are the same as those in the fixed combination.

#### **Dose Titration by Clinical Effect**

ACH-Olmesartan HCTZ is available in strengths of 20 mg / 12.5 mg, 40 mg / 12.5 mg and 40 mg / 25 mg. A patient whose blood pressure is inadequately controlled by olmesartan medoxomil or hydrochlorothiazide alone may be switched to once daily ACH-Olmesartan HCTZ. Dosage should be individualized. Depending on the blood pressure response, the dose may be titrated at intervals of 2-4 weeks.

The antihypertensive effect of ACH-Olmesartan HCTZ is related to the dose of both components over the range of 10 mg / 12.5 mg to 40 mg / 25 mg (see **ACTION AND CLINICAL PHARMACOLOGY**). The dose of ACH-Olmesartan HCTZ is one tablet once daily. More than one tablet daily is not recommended.

**Elderly:** No adjustment of dose is generally required in elderly patients (see below for dose recommendation in patients with renal impairment). If up-titration to the maximum dose of 40 mg / 25 mg daily is required, blood pressure should be closely monitored (see **ACTION AND CLINICAL PHARMACOLOGY, Special Populations**).

**Hepatic Impairment:** No adjustment of dosage is required for patients with mild hepatic impairment. Data is lacking with respect to the use of 20 mg and 40 mg olmesartan medoxomil; therefore, a lower starting dose is recommended in patients with moderate liver disease, and the maximum dose of 20 mg / 12.5 mg olmesartan medoxomil - hydrochlorothiazide daily should not be exceeded. Care should be exercised in patients with liver disease, especially in those patients with biliary obstructive disorders, as the majority of



olmesartan is eliminated in the bile. No information is available in patients with severe liver disease; therefore, use of olmesartan medoxomil in this group of patients is not recommended (see **ACTION AND CLINICAL PHARMACOLOGY, Pharmacokinetics**).

**Renal Impairment:** Owing to the limited experience of higher dosages in this patient group, the maximum dose in patients with mild to moderate renal impairment is 20 mg / 12.5 mg once daily. The use of olmesartan medoxomil in patients with severe renal impairment is not recommended, since there is only limited experience in this patient group. In patients with more severe renal impairment, loop diuretics are preferred to thiazides, so ACH-Olmesartan HCTZ is not recommended.

For patients with possible depletion of intravascular volume (e.g., patients treated with diuretics, particularly those with impaired renal function), ACH-Olmesartan HCTZ should be initiated under close medical supervision and consideration should be given to use of a lower starting dose (see **WARNINGS AND PRECAUTIONS, Renal**).

The side effects (see **WARNINGS AND PRECAUTIONS**) of olmesartan medoxomil are generally rare and independent of dose; those of hydrochlorothiazide are most typically dose-dependent (primarily hypokalemia). Some dose-independent phenomena (e.g., pancreatitis) do occur with hydrochlorothiazide. Therapy with any combination of olmesartan medoxomil and hydrochlorothiazide will be associated with both sets of dose-independent side effects. To minimize dose-independent side effects, it is usually appropriate to begin combination therapy only after a patient has failed to achieve the desired effect with monotherapy.

### **Olmesartan Medoxomil Monotherapy**

The usual recommended starting dose of olmesartan medoxomil monotherapy is 20 mg once daily in patients who are not volume-contracted. For patients requiring further reduction in blood pressure after 2 weeks of therapy, the dose may be increased to 40 mg. Doses above 40 mg do not appear to have greater effect. Twice-daily dosing offers no advantage over the same total dose given once daily.

- **Elderly:** No adjustment of dose is generally required in elderly patients (see below for dose recommendation in patients with renal impairment). If up-titration to the maximum dose of 40 mg daily is required, blood pressure should be closely monitored (see **ACTION AND CLINICAL PHARMACOLOGY, Special Populations**).
- **Hepatic Impairment:** No adjustment of dosage is required for patients with mild hepatic impairment. Data is lacking with respect to the use of 20 mg and 40 mg olmesartan medoxomil; therefore, a lower starting dose is recommended in patients with moderate liver disease, and the maximum dose of 20 mg / 12.5 mg olmesartan medoxomil-hydrochlorothiazide daily should not be exceeded. Care should be exercised in patients with liver disease, especially in those patients with biliary obstructive disorders, as the majority of olmesartan is eliminated in the bile. No information is available in patients with severe liver disease; therefore, use of olmesartan medoxomil in this group of patients is not recommended (see **ACTION AND CLINICAL PHARMACOLOGY, Pharmacokinetics**).
- **Renal Impairment:** Owing to the limited experience of higher dosages in this patient group, the maximum dose in patients with mild to moderate renal impairment is 20 mg

olmesartan medoxomil once daily. The use of olmesartan medoxomil in patients with severe renal impairment is not recommended, since there is only limited experience in this patient group.

For patients with possible depletion of intravascular volume (e.g., patients treated with diuretics, particularly those with impaired renal function), ACH-Olmesartan HCTZ should be initiated under close medical supervision and consideration should be given to use of a lower starting dose (see **WARNINGS AND PRECAUTIONS, Renal**).

If blood pressure is not controlled by olmesartan medoxomil alone, hydrochlorothiazide may be added starting with a dose of 12.5 mg and later titrated to 25 mg once daily.

Hydrochlorothiazide is effective in doses between 12.5 mg and 50 mg once daily. If a patient is taking hydrochlorothiazide, olmesartan medoxomil may be added starting with a dose of 20 mg once daily and titrated to 40 mg, for inadequate blood pressure control. If large doses of hydrochlorothiazide have been used as monotherapy and volume depletion or hyponatremia is present, caution should be used when adding olmesartan medoxomil or switching to ACH-Olmesartan HCTZ as marked decreases in blood pressure may occur (see **WARNINGS AND PRECAUTIONS, Renal**). Consideration should be given to reducing the dose of hydrochlorothiazide to 12.5 mg before adding olmesartan medoxomil.

#### **Missed Dose**

If patients miss a dose, they should wait until their next scheduled dose. Patients should not double their dose.

### **OVERDOSAGE**

For management of a suspected drug overdose, contact your regional Poison Control Centre.

#### **Olmesartan medoxomil**

Limited data are available related to overdose in humans. The most likely manifestations of overdose would be hypotension and tachycardia; bradycardia could be encountered if parasympathetic (vagal) stimulation occurs. If symptomatic hypotension should occur, supportive treatment should be initiated. The dialyzability of olmesartan is unknown.

#### **Hydrochlorothiazide**

The most common signs and symptoms of overdose observed in humans are those caused by electrolyte depletion (hypokalemia, hypochloremia, hyponatremia) and dehydration resulting from excessive diuresis. If digitalis has also been administered, hypokalemia may accentuate cardiac arrhythmias. The degree to which hydrochlorothiazide is removed by hemodialysis has not been established.

### **ACTION AND CLINICAL PHARMACOLOGY**

#### **Mechanism of Action**

#### **Olmesartan medoxomil**

Olmesartan medoxomil, a prodrug, is hydrolyzed to olmesartan during absorption from the gastrointestinal tract.

Angiotensin II is formed from angiotensin I in a reaction catalyzed by angiotensin converting enzyme (ACE, kininase II). Angiotensin II is the principal pressor agent of the renin-angiotensin system, with effects that include vasoconstriction, stimulation of synthesis and release of aldosterone, cardiac stimulation and renal reabsorption of sodium. Olmesartan blocks the vasoconstrictor effects of angiotensin II by selectively blocking the binding of angiotensin II to the AT<sub>1</sub> receptor in vascular smooth muscle. Its action is, therefore, independent of the pathways for angiotensin II synthesis.

An AT<sub>2</sub> receptor is found also in many tissues, but this receptor is not known to be associated with cardiovascular homeostasis. Olmesartan has more than a 12,500-fold greater affinity for the AT<sub>1</sub> receptor than for the AT<sub>2</sub> receptor.

Blockade of the renin-angiotensin system with ACE inhibitors, which inhibit the biosynthesis of angiotensin II from angiotensin I, is a mechanism of many drugs used to treat hypertension. ACE inhibitors also inhibit the degradation of bradykinin, a reaction also catalyzed by ACE. Because olmesartan does not inhibit ACE (kininase II), it does not affect the response to bradykinin. Whether this difference has clinical relevance is not yet known.

Blockade of the angiotensin II receptor inhibits the negative regulatory feedback of angiotensin II on renin secretion, but the resulting increased plasma renin activity and circulating angiotensin II levels do not overcome the effect of olmesartan on blood pressure.

### **Hydrochlorothiazide**

Hydrochlorothiazide is a thiazide diuretic. Thiazides affect the renal tubular mechanisms of electrolyte reabsorption, directly increasing excretion of sodium and chloride in approximately equivalent amounts. Indirectly, the diuretic action of hydrochlorothiazide reduces plasma volume, with consequent increases in plasma renin activity, increases in aldosterone secretion, increases in urinary potassium loss, and decreases in serum potassium. The renin-aldosterone link is mediated by angiotensin II, so co-administration of an angiotensin II receptor antagonist tends to reverse the potassium loss associated with these diuretics.

The mechanism of the antihypertensive effect of thiazides is not fully understood.

### **Pharmacodynamics**

#### **Olmesartan medoxomil**

Olmesartan medoxomil doses of 2.5 to 40 mg inhibit the pressor effects of angiotensin I infusion. The duration of the inhibitory effect was related to dose, with doses of olmesartan medoxomil >40 mg giving >90% inhibition at 24 hours.

Plasma concentrations of angiotensin I and angiotensin II and plasma renin activity (PRA) increase after single and repeated administration of olmesartan medoxomil to healthy subjects and hypertensive patients. Repeated administration of up to 80 mg olmesartan medoxomil had minimal influence on aldosterone levels and no effect on serum potassium.

### **Hydrochlorothiazide**

After oral administration of hydrochlorothiazide, diuresis begins within 2 hours, peaks in about 4 hours and lasts about 6 to 12 hours.

## **Pharmacokinetics**

### **Absorption:**

#### **Olmesartan medoxomil**

Olmesartan medoxomil is rapidly and completely bioactivated by ester hydrolysis to olmesartan during absorption from the gastrointestinal tract. Olmesartan appears to be eliminated in a biphasic manner with a terminal elimination half-life of approximately 13 hours. Olmesartan shows linear pharmacokinetics following single oral doses of up to 320 mg and multiple oral doses of up to 80 mg. Steady-state levels of olmesartan are achieved within 3 to 5 days and no accumulation in plasma occurs with once-daily dosing.

The absolute bioavailability of olmesartan is approximately 26%. After oral administration, the peak plasma concentration ( $C_{max}$ ) of olmesartan is reached after 1 to 2 hours. Food does not affect the bioavailability of olmesartan.

#### **Hydrochlorothiazide**

When plasma levels have been followed for at least 24 hours, the plasma half-life has been observed to vary between 5.6 and 14.8 hours.

### **Distribution:**

#### **Olmesartan**

The volume of distribution of olmesartan is approximately 17 L. Olmesartan is highly bound to plasma proteins (99%) and does not penetrate red blood cells. The protein binding is constant at plasma olmesartan concentrations well above the range achieved with recommended doses.

In rats, olmesartan crossed the blood-brain barrier poorly, if at all. Olmesartan passed across the placental barrier in rats and was distributed to the fetus. Olmesartan was distributed to milk at low levels in rats.

#### **Hydrochlorothiazide**

Hydrochlorothiazide crosses the placental but not the blood-brain barrier and is excreted in breast milk.

### **Metabolism and Excretion:**

#### **Olmesartan medoxomil**

Following the rapid and complete conversion of olmesartan medoxomil to olmesartan during absorption, there is virtually no further metabolism of olmesartan. Total plasma clearance of olmesartan is 1.3 L / h, with a renal clearance of 0.6 L / h. Approximately 35% to 50% of the absorbed dose is recovered in urine while the remainder is eliminated in feces via the bile.

#### **Hydrochlorothiazide**

Hydrochlorothiazide is not metabolized but is eliminated rapidly by the kidney. At least 61% of the oral dose is eliminated unchanged within 24 hours.

## **Special Populations and Conditions**

**Pediatrics (<18 years of age):** The pharmacokinetics of olmesartan have not been investigated in patients <18 years of age.

**Geriatrics (≥65 years of age):** The pharmacokinetics of olmesartan were studied in the elderly (≥65 years). Overall, maximum plasma concentrations of olmesartan were similar in young adults and the elderly. Modest but statistically significant accumulation of olmesartan was observed in the elderly with repeated dosing; AUC<sub>ss,τ</sub> was 33% higher in elderly patients, corresponding to an approximate 30% reduction in CL<sub>R</sub>. However, the clinical relevance is unknown.

**Gender:** Minor differences were observed in the pharmacokinetics of olmesartan in women compared to men. AUC and C<sub>max</sub> were 10-15% higher in women than in men.

**Race:** The antihypertensive effect of olmesartan was smaller in Black patients (usually a low-renin population), as has been seen with other ACE inhibitors, angiotensin receptor blockers and beta-blockers.

**Hepatic Insufficiency:** Increases in AUC<sub>0-α</sub> and C<sub>max</sub> for olmesartan were observed in patients with moderate hepatic impairment compared to those in matched controls, with an increase in AUC of about 60%.

**Renal Insufficiency:** In patients with renal insufficiency, serum concentrations of olmesartan were elevated compared to subjects with normal renal function. After repeated dosing, the AUC was approximately tripled in patients with severe renal impairment (creatinine clearance <20 mL / min). The pharmacokinetics of olmesartan in patients undergoing hemodialysis has not been studied.

## STORAGE AND STABILITY

Store at 15°C - 30°C.

## DOSAGE FORMS, COMPOSITION AND PACKAGING

DOSAGE FORM: ACH-Olmesartan HCTZ (olmesartan medoxomil and hydrochlorothiazide) is available as film-coated tablets.

COMPOSITION: ACH-Olmesartan HCTZ is supplied as:

20 mg / 12.5 mg: reddish-yellow, round, film-coated tablets; debossed with “OH1” on one side and plain on other side. Each tablet contains 20 mg of olmesartan medoxomil and 12.5 mg of hydrochlorothiazide;

40 mg / 12.5 mg: reddish-yellow, oval film-coated tablets; debossed with “OH2” on one side and plain on other side. Each tablet contains 40 mg of olmesartan medoxomil and 12.5 mg of hydrochlorothiazide;

40 mg / 25 mg: pink, oval, film-coated tablets, debossed with “OH3” on one side and plain on other side. Each tablet contains 40 mg of olmesartan medoxomil and 25 mg of hydrochlorothiazide.

All tablet strengths contain the following inactive ingredients: hydroxypropylcellulose, lactose monohydrate, microcrystalline cellulose, low-substituted hydroxypropylcellulose, magnesium stearate, hydroxypropyl methylcellulose, polyethylene glycol, titanium dioxide, talc, iron oxide yellow and iron oxide red.

#### PACKAGING:

20 mg / 12.5 mg, 40 mg / 12.5 mg, and 40 mg / 25 mg:

Bottle of 30 tablets, Bottle of 90 tablets, Bottle of 500 tablets, Bottle of 1000 tablets. Blister packs of 100 tablets (carton box containing 10 blisters of 10 tablets each).

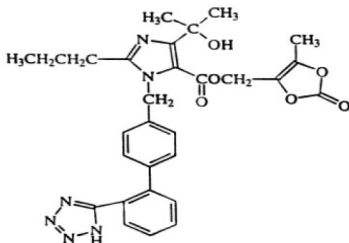
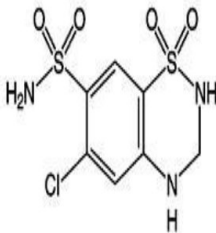
40 mg / 12.5 mg and 40 mg / 25 mg:

30 tablets (carton box containing 3 blisters of 10 tablets each)

## PART II: SCIENTIFIC INFORMATION

### PHARMACEUTICAL INFORMATION

#### Drug Substance

Proper / common name:	Olmesartan medoxomil	Hydrochlorothiazide
Chemical name:	1 <i>H</i> -imidazole-5-carboxylic acid, 4-(1-hydroxy-1-methylethyl)-2-propyl-1-[[2'-(1 <i>H</i> -tetrazol-5-yl) [1,1'-biphenyl]-4yl]methyl]-, (5-methyl-2-oxo-1,3-dioxol-4-yl) methyl ester	6-chloro-3,4-dihydro-2 <i>H</i> -1,2,4-benzo-thiadiazine-7-sulfonamide 1,1-dioxide
Molecular formula and molecular mass:	C <sub>29</sub> H <sub>30</sub> N <sub>6</sub> O <sub>6</sub> 558.6 g / mol	C <sub>7</sub> H <sub>8</sub> ClN <sub>3</sub> O <sub>4</sub> S <sub>2</sub> 297.7 g / mol
Structural formula:	 <p>The structure of Olmesartan medoxomil consists of an imidazole ring substituted with a propyl group, a 1-hydroxy-1-methylethyl group, and a methyl ester of a 5-(4-(1,1'-biphenyl-4-yl)-1H-imidazol-2-yl)-2-methyl-1,3-dioxolane-2-carboxylic acid moiety.</p>	 <p>The structure of Hydrochlorothiazide is a 1,2,4-benzothiadiazine 1,1-dioxide derivative. It features a benzene ring fused to a six-membered ring containing two sulfur atoms (one as a sulfonamide group, -SO<sub>2</sub>NH<sub>2</sub>, and the other as a sulfone group, -SO<sub>2</sub>-) and a chlorine atom at the 6-position.</p>
Physicochemical properties:	<ul style="list-style-type: none"> <li>• white or almost white crystalline powder</li> <li>• Practically insoluble in water; slightly soluble in ethanol (96%), practically insoluble in heptane.</li> </ul> <p>The dissociation constant (pK<sub>a</sub>) of olmesartan medoxomil was determined by the UV method to be 4.3, when measured at 20°C in Britton Robinson buffer solution (I = 0.5).</p>	<ul style="list-style-type: none"> <li>• white or almost white, crystalline powder</li> <li>• Very slightly soluble in water, soluble in acetone, sparingly soluble in ethanol (96%). It dissolves in dilute solutions of alkali hydroxides.</li> </ul> <p>The pK<sub>a</sub> values are 8.6 and 9.9 (Dollery's Therapeutic Drugs quotes 7.9 and 9.2)</p>

## CLINICAL TRIALS

### Comparative Bioavailability Studies

**Summary of the studies establishing bioequivalence of ACH-Olmesartan HCTZ (Olmesartan Medoxomil/Hydrochlorothiazide) 40 mg/25 mg tablets to <sup>Pr</sup>OLMETEC PLUS<sup>®</sup> (Olmesartan Medoxomil/Hydrochlorothiazide) 40 mg/25 mg tablets.**

A double blind, balanced, randomized, two treatment, two sequence, two period, single oral dose, crossover bioequivalence study of 1 x ACH-Olmesartan HCTZ (olmesartan medoxomil/hydrochlorothiazide) 40 mg/25 mg tablets (Accord Healthcare Inc.) and 1 x <sup>Pr</sup>OLMETEC PLUS<sup>®</sup> (olmesartan medoxomil/hydrochlorothiazide) 40 mg/25 mg tablets (Merck Canada Inc.) was conducted in 38 healthy, adult, human male subjects under fasting conditions.

The summary of results for olmesartan are presented in the following table

Olmesartan (1 x olmesartan medoxomil/hydrochlorothiazide 40 mg/25 mg tablet ) From measured data Geometric Mean Arithmetic Mean (CV %)				
Parameter	Test*	Reference <sup>†</sup>	% Ratio of Geometric Means	90% Confidence Interval
AUC <sub>T</sub> (ng.h / mL)	9579.5 9882.5 (23.0)	8218.6 8515.6 (26.7)	116.6	110.1 – 123.4
AUC <sub>I</sub> (ng.h / mL)	9727.2 10034.3 (23.1)	8375.4 8680.1 (26.7)	116.1	109.8 – 122.9
C <sub>max</sub> (ng / mL)	1342.0 1383.9 (23.9)	1104.2 1141.1 (25.7)	121.5	114.0 – 129.6
T <sub>max</sub> <sup>§</sup> (h)	2.00 (1.00 – 5.00)	2.25 (1.00 – 4.50)		
T <sub>1/2</sub> <sup>€</sup> (h)	8.7 (16.6)	9.3 (46.3)		

\* ACH-Olmesartan HCTZ (olmesartan medoxomil/hydrochlorothiazide) 40 mg/25 mg tablets (Accord Healthcare Inc.).

<sup>†</sup> <sup>Pr</sup>OLMETEC PLUS<sup>®</sup> (olmesartan medoxomil /hydrochlorothiazide) 40 mg/25 mg tablets (Merck Canada Inc.) were purchased in Canada.

<sup>§</sup> Expressed as the median (range) only.

<sup>€</sup> Expressed as the arithmetic mean (CV%) only.



The summary of results for hydrochlorothiazide are presented in the following table

Hydrochlorothiazide (1 x olmesartan medoxomil/hydrochlorothiazide 40 mg/25 mg tablet) From measured data Geometric Mean Arithmetic Mean (CV %)				
Parameter	Test*	Reference†	% Ratio of Geometric Means	90% Confidence Interval
AUC <sub>T</sub> (ng.h / mL)	1148.9 1186.3 (24.6)	1084.6 1116.3 (23.2)	105.9	102.0 – 110.0
AUC <sub>I</sub> (ng.h / mL)	1179.4 1218.5 (24.9)	1112.6 1145.6 (23.5)	106.0	102.1 – 110.1
C <sub>max</sub> (ng / mL)	159.6 169.5 (34.3)	152.3 159.7 (28.9)	104.8	98.3 – 111.7
T <sub>max</sub> § (h)	1.86 (0.75 – 4.50)	1.86 (1.0 – 4.5)		
T <sub>1/2</sub> € (h)	9.8 (8.9)	9.5 (11.8)		

\* ACH-Olmesartan HCTZ (olmesartan medoxomil/hydrochlorothiazide) 40 mg/25 mg tablets (Accord Healthcare Inc.).

† PrOLMETEC PLUS® (olmesartan medoxomil /hydrochlorothiazide) 40 mg/25 mg tablets (Merck Canada Inc.) were purchased in Canada.

§ Expressed as the median (range) only.

€ Expressed as the arithmetic mean (CV%) only.

### Study demographics and trial design

The antihypertensive effects of olmesartan medoxomil-hydrochlorothiazide have been demonstrated in clinical trials in which 1230 of 2757 patients with mild to moderate essential hypertension were exposed to a combination of olmesartan medoxomil (2.5 mg to 40 mg) and hydrochlorothiazide (12.5 mg to 25 mg). These clinical trials included one placebo-controlled factorial trial (n=502) in mild-moderate hypertensives with combinations of olmesartan medoxomil (10 mg, 20 mg, 40 mg or placebo) and hydrochlorothiazide (12.5 mg, 25 mg or placebo) for 8 weeks. Across treatment groups, the percentage of male patients ranged from 48.7% to 65.9% and the mean age ranged from 49.9 to 54.7 years. At least 58.1% in all treatment groups were Caucasian and most patients (at least 76.1%) were <65 years of age.

### Study results

Once-daily dosing with 20 mg olmesartan medoxomil and 12.5 mg hydrochlorothiazide, 40 mg olmesartan medoxomil and 12.5 mg hydrochlorothiazide or 40 mg olmesartan medoxomil and 25 mg hydrochlorothiazide produced mean placebo-adjusted systolic and diastolic blood pressure reductions at trough (24 hours post-dosing) ranging from 17 / 8 to 24 / 14 mm Hg, respectively. The antihypertensive effect of the combination on trough blood pressure was related to the dose of each component (see table below). No appreciable changes in trough heart rate were observed with combination therapy in the placebo-controlled trial.

<b>Table 2: Placebo-Adjusted Changes in Sitting Systolic / Diastolic Blood Pressure (mm Hg)</b>				
HCTZ Dose	Olmesartan Medoxomil Dose			
	0 mg	10 mg	20 mg	40 mg
0 mg	--	7 / 5	12 / 5	13 / 7
12.5 mg	5 / 1	17 / 8*	17 / 8*	16 / 10*
25 mg	14 / 5	19 / 11*	22 / 11*	24 / 14*

The onset of the antihypertensive effect occurred within 1 week and was near maximal at 4 weeks of treatment. All 6 dose combinations were statistically significantly more effective than placebo in lowering sitting diastolic blood pressure at Week 8 ( $P < 0.05$ ). The placebo-adjusted decrease in sitting diastolic blood pressure was approximately additive as follows: 5 mm Hg to 9 mm Hg for 10 mg to 40 mg olmesartan medoxomil + 12.5 mg HCTZ and 9 mm Hg to 14 mm Hg for 10 mg to 40 mg olmesartan medoxomil + 25 mg HCTZ, compared to 3 mm Hg to 6 mm Hg for 10 mg to 40 mg olmesartan medoxomil alone and 2 mm Hg to 5 mm Hg for 12.5 mg to 25 mg HCTZ alone.

Results of secondary efficacy variable analysis sitting systolic blood pressure demonstrated that the 6 olmesartan medoxomil + HCTZ combinations produced effects similar to those observed for sitting diastolic blood pressure at Week 8. The reduction in systolic blood pressure generally was more pronounced than the reduction in diastolic blood pressure. The placebo-adjusted decrease in sitting systolic blood pressure was approximately additive as follows: 14 mm Hg to 17 mm Hg for 10 mg to 40 mg olmesartan medoxomil + 12.5 mg HCTZ and 20 mm Hg to 24 mm Hg for 10 mg to 40 mg olmesartan medoxomil + 25 mg HCTZ, compared to 7 mm Hg to 13 mm Hg for 10 mg to 40 mg olmesartan medoxomil alone and 6 mm Hg to 14 mm Hg for 12.5 mg to 25 mg HCTZ alone. Results of the analyses of standing diastolic and systolic blood pressures were consistent with those of sitting blood pressure.

The results of the responder rate analysis were consistent with the results of the analyses of the change in blood pressure from baseline to Week 8. The responder rate increased when HCTZ was combined with olmesartan medoxomil, and also increased with increasing olmesartan medoxomil and HCTZ dose. The highest responder rate (92%) was observed for the highest dose of the combination (40 mg olmesartan medoxomil + 25 mg HCTZ).

The antihypertensive effect was independent of gender, but there were too few subjects to identify response differences based on race or age greater than or less than 65 years. The blood pressure lowering effect of olmesartan medoxomil-hydrochlorothiazide combination was maintained in long-term studies for up to 2 years. The overall response to the combination treatment was similar in Black and non-Black patients in the placebo-controlled trial.

Administered doses of 10 mg, 20 mg, or 40 mg olmesartan medoxomil combined with 12.5 mg or 25 mg hydrochlorothiazide was shown to be well tolerated and statistically significantly more effective than placebo in lowering sitting diastolic blood pressure at Week 8. The magnitude of blood pressure reduction increased with increasing dose of olmesartan medoxomil and HCTZ. There was no evidence of a rebound effect in sitting diastolic blood pressure after discontinuation of olmesartan medoxomil + HCTZ.

In a supportive Phase III placebo-controlled, double-blind multi-centre study of 20 mg olmesartan medoxomil combined with either HCTZ 12.5 mg or 25 mg in patients with essential hypertension not controlled by olmesartan monotherapy, statistical significant evidence of reduction in mean daytime diastolic BP was achieved after eight weeks of combined therapy with the 25 mg HCTZ dose, but not with the 12.5 mg HCTZ dose. However, efficacy of the 12.5 mg HCTZ dose was demonstrated in eight other supportive trials.

Clinical studies of olmesartan medoxomil-hydrochlorothiazide did not include sufficient numbers of subjects aged 65 and over to determine whether they respond differently from younger subjects (see **CLINICAL TRIALS**).

## **DETAILED PHARMACOLOGY**

### **Animal Pharmacology**

The results of clinical and nonclinical pharmacology studies demonstrated that olmesartan, the active form of olmesartan medoxomil, is an AII receptor antagonist that binds selectively and competitively to the AT<sub>1</sub> receptor, with negligible binding to the AT<sub>2</sub> receptor. Olmesartan was shown to be both a potent and long-lasting AII antagonist in both humans and animals.

The antihypertensive effect of olmesartan depends on the activity of the renin-angiotensin system, as demonstrated by its effectiveness in different animal models of hypertension. In rat models, olmesartan is most effective in renal hypertensive rats, followed by spontaneously hypertensive rats, normotensive rats, and DOCA-salt hypertensive rats. Olmesartan also significantly decreased blood pressure in Goldblatt hypertensive Beagle dogs. The antihypertensive effect is dose-dependent and has a long duration of action. From hemodynamic studies conducted with olmesartan medoxomil, it appears that the antihypertensive effect is due to dilation of blood vessels throughout the body; however, regional blood flow in major organs is unaffected except for the kidney, where blood flow is markedly increased. It was also demonstrated that olmesartan ameliorated hypertension- and diabetic induced nephropathy in different rat models.

General pharmacology studies demonstrated that olmesartan had little effect on a variety of physiological systems, except for those that would be expected based on its pharmacology activity. Therefore, it is expected that olmesartan would produce minimal adverse effects at pharmacological doses.

Co-administration of olmesartan medoxomil and HCTZ (at ratios of 1:10 and 1:100) decreased blood pressure in spontaneously hypertensive rats to a greater extent than olmesartan medoxomil or HCTZ administered alone, indicating that there was an additive effect on blood pressure. Plasma renin activity was increased in animals treated with olmesartan medoxomil or olmesartan medoxomil / HCTZ, due to the pharmacological activity of olmesartan. Urine volume and total excretion of sodium and potassium was increased in animals treated with HCTZ or olmesartan medoxomil / HCTZ, due to the pharmacological activity of HCTZ.

## **TOXICOLOGY**

### **Acute Toxicity**

Olmesartan medoxomil has low oral acute toxicity in mice, rats and dogs. Doses up to 2000 mg / kg were administered to rats and mice and 1500 mg / kg to dogs with no clinical signs or mortality. Intravenous toxicity studies were conducted with olmesartan, the active metabolite, in mice and rats. Severe clinical signs occurred at all doses administered in mice ( $\geq 1700$  mg / kg) and rats ( $\geq 1400$  mg / kg) with lethality in mice at  $\geq 1850$  mg / kg and at  $\geq 1550$  mg / kg in rats.

### **Long Term Toxicity**

Oral repeat dose toxicity studies were conducted in mice, rats and dogs with olmesartan medoxomil. Repeat dose (14-day) intravenous studies were conducted with olmesartan (the active metabolite) in rats and dogs. These studies demonstrated that olmesartan medoxomil was well tolerated at doses up to 4000 mg / kg / day in mice (90 days), 1000 mg / kg / day in rats (6 months) and 160 mg / kg / day in dogs (12 months). There were no treatment-related clinical findings at these dose levels. Severe clinicopathological effects associated with uremia necessitated the early necropsy of one dog administered 500 mg / kg (90-day study).

Hematological effects (decreased RBC count, hemoglobin, hematocrit, prothrombin time, activated partial thromboplastin time) in rodents, clinical chemistry changes (increase in BUN and creatinine) in rodents and dogs, and histopathological findings in kidneys of rodents and dogs were observed. In kidney, hypertrophy and hyperplasia of the juxtaglomerular apparatus, accompanied by an increase in cytoplasmic granularity are considered to be due to the pharmacological effects of olmesartan on the Renin-Angiotensin System. At high doses, renal tubular regeneration was observed in rats and dogs and progressive increase in chronic neuropathy was observed in rats.

Decreased heart weights, observed in mice and rats were attributed to a decrease in heart muscle load following a reduction in blood pressure.

Saline as a water source in rats treated with olmesartan medoxomil attenuated/eliminated the observed effect.

The findings from studies in rats and dogs where olmesartan was administered IV for 14 days were consistent with the above-mentioned findings observed after oral administration.

Similarly, olmesartan medoxomil + HCTZ in combination showed effects on the kidneys which were considered to be secondary to the pharmacological activity of olmesartan and HCTZ. Oral administration of olmesartan medoxomil / HCTZ to rats for 26 weeks resulted in histopathological changes in the kidneys which were part of the spectrum of changes associated with chronic progressive nephropathy in rats. The NOAEL was 16.25 mg / kg / day in rats. The results of the 26-week oral toxicity study in dogs demonstrated that olmesartan medoxomil / HCTZ produced hypertrophy and eosinophilia of the renal tubules. The NOAEL for olmesartan medoxomil / HCTZ was 6.5 mg / kg / day for males, based on the tubular eosinophilia observed at  $\geq 13$  mg / kg / day, and 52 mg / kg / day for females.

## **Mutagenicity**

Both olmesartan medoxomil and olmesartan tested negative in the *in vitro* Syrian hamster embryo cell transformation assay and showed no evidence of genetic toxicity in the Ames (bacterial mutagenicity) test. However, both were shown to induce chromosomal aberrations in cultured cells *in vitro* (Chinese hamster lung) and both tested positive for thymidine kinase mutations in the *in vitro* mouse lymphoma assay. Olmesartan medoxomil tested negative *in vivo* for mutations in the MutaMouse intestine and kidney, for clastogenicity in mouse bone marrow (micronucleus test), DNA repair in the UDS assay and DNA fragmentation in the Comet assay at oral doses of up to 2000 mg / kg.

Olmesartan medoxomil-HCTZ was negative in the *in vitro* bacterial reverse mutation test up to concentrations of 5411 µg / plate and *in vivo* mouse bone marrow micronucleus test in a ratio of 20:12.5 mg / kg, at doses up to 3144 mg / kg. There was no synergism in clastogenic activity between olmesartan medoxomil and HCTZ in combination ratios of 40:12.5, 20:12.5 and 10:12.5 µg / mL, in the *in vitro* Chinese hamster lung (CHL) chromosomal aberration assay.

## **Carcinogenicity**

Oncogenicity studies demonstrated that olmesartan medoxomil was not carcinogenic when administered at doses up to 2000 mg / kg / day to rats for up to 2 years (equivalent to about 480 times the maximum recommended human dose (MRHD) of 40 mg / day on a mg / m<sup>2</sup> basis).

A 26-week oncogenicity study conducted in the transgenic mouse strain C57BL / 6 TacfBR-[KO] N5 p53(+/-) treated with up to 1000 mg / kg / day (about 120 times the MRHD) olmesartan medoxomil revealed no evidence of carcinogenic potential. No carcinogenicity studies were conducted with olmesartan medoxomil and hydrochlorothiazide.

## **Hydrochlorothiazide**

According to the experimental data available, hydrochlorothiazide revealed inconsistent evidence of carcinogenic activity in rats and mice, with conflicting evidence of hepatic adenoma in male mice at the highest dose and adrenal pheochromocytoma in one rat study but not in another. Current evidence is inadequate to draw a clear conclusion for a carcinogenic effect of hydrochlorothiazide in animals.

The mutagenic potential was assessed in a series of *in vitro* and *in vivo* test systems. While some positive results were obtained *in vitro*, all *in vivo* studies provided negative results. Hydrochlorothiazide enhanced the UVA-induced formation of pyrimidine dimers *in vitro* and in the skin of mice following oral treatment. It is therefore concluded that although there is no relevant mutagenic potential *in vivo*, hydrochlorothiazide could enhance the genotoxic effects of UVA light. This mechanism of photosensitization could be associated with a higher risk for non-melanoma skin cancer.

## **Reproduction Studies**

There was no effect on fertility in rats at doses up to 1000 mg / kg / day (240 times the MRHD) of

olmesartan medoxomil. No teratogenic effects and no significant effects on the number of corpora lutea, implants and dead/live fetuses were observed in rats at doses up to 1000 mg / kg / day and in rabbits at doses up to 1 mg / kg / day. Perinatal/postnatal toxicity studies in rats demonstrated that a NOAEL for developmental toxicity is 0.3 mg / kg / day of olmesartan medoxomil.

Olmesartan / HCTZ had no effect on embryo-fetal development in mice. Embryo-fetal toxicity studies conducted in rats treated with olmesartan medoxomil / HCTZ at doses up to 1625 mg / kg / day produced developmental delays related to the extent of maternal toxicity; the developmental NOAEL for this effect was 162.5 mg / kg / day. No perinatal / postnatal studies were conducted with olmesartan medoxomil / HCTZ.

## REFERENCES

Ball KJ, Williams PA, Stumpe KO. Relative efficacy of an angiotensin II antagonist compared with other antihypertensive agents. Olmesartan medoxomil versus antihypertensives, J Hypertens 2001; 19(suppl 1):S49-56.

Chrysant SG, Weber MA, Wang A, Hinman DJ. Evaluation of antihypertensive therapy with the combination of olmesartan medoxomil and hydrochlorothiazide. Am J Hypertens 2004; 17(3):252-259.

Giles T, Oparil S, Silfani T, et al. Comparison of increasing doses of olmesartan medoxomil, losartan potassium, and valsartan in patients with essential hypertension. J Clin Hypertens 2007; 9(3):187-195.

Haller et al. Olmesartan for the delay or prevention of microalbuminuria in type 2 diabetes. N Engl J Med. 2011; 364(10):907-17.

MacFadyen RJ, Reid JL. Angiotensin receptor antagonists as a treatment for hypertension. J Hypertens 1994;12:1333-1338.

Neutel JM. Clinical studies of CS-866, the newest angiotensin II receptor antagonist. Am J Cardiol 2001; 87 (8A):37C-43C.

Neutel JM, Elliott WJ, Izzo JL, Chen CL, Masonson HN. Antihypertensive efficacy of olmesartan medoxomil, a new angiotensin II receptor antagonist, as assessed by ambulatory blood pressure measurements. J Clin Hypertens 2002; 4(5):325-31.

Neutel JM, Smith DH, Silfani TN, Lee Y, Weber MA. Effects of a structured treatment algorithm on blood pressure goal rates in both stage 1 and stage 2 hypertension. J. Human Hypertension 2006; 255-62.

Neutel JM, Smith DH, Weber MA, Wang AC, Masonson HN. Use of an olmesartan medoxomil-based treatment algorithm for hypertension control. J Clin Hypertens 2004; 6(4):168-74.

Resnick LM, Catanzaro D, Sealey JE, Laragh JH. Acute vascular effects of the angiotensin II receptor antagonist olmesartan in normal subjects: relation to the renin-aldosterone system. Am J Hypertens 2004; 17(3):203-8.

<sup>Pr</sup> OLMETEC PLUS<sup>®</sup> olmesartan medoxomil and hydrochlorothiazide 20 mg/12.5 mg, 40 mg/12.5 mg, and 40 mg/25 mg Tablets, Control no # 224593, Product Monograph, Merck Canada Inc. (May 22, 2019).

## **PART III: CONSUMER INFORMATION**

### **Pr ACH-Olmesartan HCTZ**

Olmesartan medoxomil and Hydrochlorothiazide  
Tablets

20 mg / 12.5 mg, 40 mg / 12.5 mg, and 40 mg / 25 mg

**Read this carefully before you start taking ACH-Olmesartan HCTZ and each time you get a refill. This leaflet is a summary and will not tell you everything about ACH-Olmesartan HCTZ. Talk to your doctor, nurse or pharmacist about your medical condition and treatment and ask if there is any new information about ACH-Olmesartan HCTZ.**

### **ABOUT THIS MEDICATION**

#### **What the medication is used for:**

ACH-Olmesartan HCTZ lowers high blood pressure.

#### **What it does:**

ACH-Olmesartan HCTZ contains a combination of two drugs, olmesartan medoxomil and hydrochlorothiazide:

- Olmesartan medoxomil is an angiotensin receptor blocker (ARB). You can recognize an ARB because its medicinal ingredient ends in “-SARTAN”. It lowers blood pressure.
- Hydrochlorothiazide is a diuretic or “water pill” that increases urination. This lowers blood pressure.

This medicine does not cure high blood pressure. It helps to control it. Therefore, it is important to continue taking ACH-Olmesartan HCTZ regularly even if you feel fine.

#### **When it should not be used:**

Do not take ACH-Olmesartan HCTZ if you:

- Are allergic to olmesartan medoxomil, hydrochlorothiazide or to any non-medicinal ingredient in the formulation or components of the container.
- Are allergic to any sulphonamide-derived drugs (sulfa drugs): most of them have a medicinal ingredient that ends in “-MIDE”.
- Have experienced an allergic reaction (angioedema) with swelling of the hands, feet, or ankles, face, lips, tongue, throat, or sudden difficulty breathing or swallowing to any ARB (any drug in the same class as olmesartan medoxomil). Be sure to tell your doctor, nurse, or pharmacist that this has happened to you.
- Have difficulty urinating or produce no urine.
- Are pregnant or intend to become pregnant. Taking ACH-Olmesartan HCTZ during pregnancy can cause injury and even death to your baby.
- Are breastfeeding. ACH-Olmesartan HCTZ passes into breast milk.
- Are already taking a blood pressure-lowering medicine that contains aliskiren (such as Rasilez) and you have diabetes or kidney disease.

- Have one of the following rare hereditary diseases
  - Galactose intolerance
  - Lapp lactase deficiency
  - Glucose-galactose malabsorption

Because lactose is a non-medicinal ingredient in ACH-Olmesartan HCTZ.

#### **What the medicinal ingredients are:**

Olmesartan medoxomil and hydrochlorothiazide

#### **What the non-medicinal ingredients are:**

Hydroxypropylcellulose, lactose monohydrate, microcrystalline cellulose, low-substituted hydroxypropylcellulose, magnesium stearate, hydroxypropyl methylcellulose, polyethylene glycol, titanium dioxide, talc, iron oxide yellow and iron oxide red.

#### **What dosage forms it comes in:**

Tablets: 20 mg/12.5 mg, 40 mg/12.5 mg and 40 mg/25 mg.

### **WARNINGS AND PRECAUTIONS**

#### **Serious Warnings and Precautions –Pregnancy**

ACH-Olmesartan HCTZ should not be used during pregnancy. If you discover that you are pregnant while taking ACH-Olmesartan HCTZ, stop the medication and contact your doctor, nurse or pharmacist as soon as possible.

#### **BEFORE you use ACH-Olmesartan HCTZ talk to your doctor, nurse or pharmacist if you:**

- Have had skin cancer or have a family history of skin cancer.
- Have a greater chance of developing skin cancer because you have light-coloured skin, get sunburned easily, or are taking drugs to suppress your immune system.
- Are allergic to any drug used to lower blood pressure, including angiotensin converting enzyme (ACE) inhibitors, or penicillin.
- Have narrowing of an artery or a heart valve.
- Have had a heart attack or stroke.
- Have heart failure.
- Have diabetes, liver or kidney disease.
- Are taking a medicine that contains aliskirin, such as Rasilez, used to lower high blood pressure. The combination with ACH-Olmesartan HCTZ is not recommended.
- Are taking an angiotensin converting enzyme inhibitor (ACEI). You can recognize ACEIs because their medicinal ingredient ends in “-PRIL”.
- Have lupus or gout.
- Are on dialysis.
- Are dehydrated or suffer from excessive vomiting, diarrhea, or sweating.
- Are taking a salt substitute that contains potassium, potassium supplements, or a potassium-sparing



diuretic (a specific kind of “water pill”).

- Are on a low-salt diet.
- Are less than 18 years old.
- Are taking any medication including non-prescription or herbal products.
- You have to undergo any kind of surgery and general anesthesia.

**Risk of skin cancer:**

ACH-Olmesartan HCTZ contains hydrochlorothiazide. Treatment with hydrochlorothiazide may increase the risk of developing non-melanoma skin cancer. The risk is higher if you have been taking ACH-Olmesartan HCTZ for many years (more than 3) or at a high dose.

While taking ACH-Olmesartan HCTZ:

- Make sure to regularly check your skin for any new lesions. Check areas that are most exposed to the sun, such as the face, ears, hands, shoulders, upper chest and back.
- Limit your exposure to the sun and to indoor tanning. Always use sunscreen (SPF-30 or higher) and wear protective clothing when going outside.
- Talk to your doctor immediately if you get more sensitive to the sun or UV light or if you develop an unexpected skin lesion (such as a lump, bump, sore, or patch) during the treatment.

ACH-Olmesartan HCTZ can cause severe chronic diarrhea with substantial weight loss (sprue-like enteropathy). It can take months to years for symptoms to develop.

**Hydrochlorothiazide in ACH-Olmesartan HCTZ can cause Sudden Eye Disorders:**

- **Myopia:** sudden nearsightedness or blurred vision.
- **Glaucoma:** an increased pressure in your eyes, eye pain. Untreated, it may lead to permanent vision loss. These eye disorders are related and can develop within hours to weeks of starting ACH-Olmesartan HCTZ.

You may become sensitive to the sun while taking ACH-Olmesartan HCTZ. Exposure to sunlight should be minimized until you know how you respond.

**Driving and using machines:** Before you perform tasks which may require special attention, wait until you know how you respond to ACH-Olmesartan HCTZ. Dizziness, lightheadedness, or fainting can especially occur after the first dose and when the dose is increased.

Avoid alcoholic beverages until you have discussed their use with your physician. Alcohol consumption may alter your blood pressure.

If ACH-Olmesartan HCTZ is taken with medicines to

reduce pain and swelling (called Non-steroidal anti-inflammatory drugs (NSAIDs) or with COX-2 inhibitors), you may experience:

- Decreased kidney function or sudden kidney failure. If you notice a decrease in the amount of urine you produce, generalized swelling, weakness, shortness of breath, or irregular heartbeats, loss of appetite, lethargy, and fatigue, contact your doctor or go to the emergency department of the hospital right away.
- A decreased ability of ACH-Olmesartan HCTZ to lower your blood pressure. This means that ACH-Olmesartan HCTZ may not be able to lower your blood pressure as it is expected to do. If this happens, speak with your doctor or pharmacist.

**INTERACTIONS WITH THIS MEDICATION**

As with most medications, interaction with other drugs are possible. Tell your doctor, nurse, or pharmacist about all the medicines you take, including drugs prescribed by other doctors, vitamins, minerals, natural supplements, or alternative medicines.

The following may interact with ACH-Olmesartan HCTZ:

- Adrenocorticotrophic hormone (ACTH) used to treat West Syndrome
- Alcohol, barbiturates (sleeping pills), or narcotics (strong pain medications). They may cause low blood pressure and dizziness when you go from lying or sitting to standing up.
- Amphotericin B, an antifungal drug.
- Anticancer drugs, including cyclophosphamide and methotrexate.
- Antidepressants, in particular selective serotonin reuptake inhibitors (SSRIs), including citalopram, escitalopram, and sertraline.
- Antidiabetic drugs, including insulin and oral medicines.
- Bile acid resins used to lower cholesterol.
- Other blood pressure lowering drugs. When taken in combination with ACH-Olmesartan HCTZ, they may cause excessively low blood pressure.
- Calcium or vitamin D supplements.
- Corticosteroids used to treat joint pain and swelling.
- Digoxin, a heart medicine.
- Drugs that slow down or speed up bowel function, including atropine, metoclopramide and domperidone.
- Drugs used to treat epilepsy, including carbamazepine and topiramate.
- Gout medications, including allopurinol and probenecid.
- Lithium used to treat bipolar disease.
- Nonsteroidal anti-inflammatory drugs (NSAIDs), used for arthritis and to reduce pain and swelling. Examples include ibuprofen, naproxen, and celecoxib.

- Skeletal muscle relaxants used to relieve muscle spasms, including tubocurarine.
- Pressor amines such as norepinephrine.
- Sympathomimetics
- Anesthetics
- Amantadine
- Anticholinergic agents
- Cyclosporine
- Blood pressure-lowering drugs, including diuretics ("water pills"), aliskiren-containing products (e.g. Rasilez), or angiotensin converting enzyme inhibitors (ACEIs).

### PROPER USE OF THIS MEDICATION

Take ACH-Olmesartan HCTZ exactly as prescribed. It is recommended to take your dose at about the same time everyday.

Dosage must be individualized. ACH-Olmesartan HCTZ is not for initial therapy.

ACH-Olmesartan HCTZ may be taken with or without food. If ACH-Olmesartan HCTZ causes upset stomach, take it with food or milk.

#### Usual Adult dose:

One tablet daily.

#### Overdose:

If you think you have taken too much ACH-Olmesartan HCTZ contact your healthcare professional, hospital emergency department or regional Poison Control Centre immediately, even if there are no symptoms.

#### Missed Dose:

If you have forgotten to take your dose during the day, carry on with the next one at the usual time. Do not double dose.

### SIDE EFFECTS AND WHAT TO DO ABOUT THEM

Side effects may include:

- upper respiratory tract infection, cough.
- back or leg pain, muscle cramps, spasms and pain, weakness, restlessness
- dizziness, pins and needles in your fingers, headache
- constipation, diarrhea, nausea, vomiting, decreased appetite, upset stomach, enlargement of the glands in your mouth
- bleeding under the skin, rash, red patches on the skin
- fatigue, drowsiness, insomnia
- reduced libido

If any of these affects you severely, tell your doctor,

nurse or pharmacist.

ACH-Olmesartan HCTZ can cause abnormal blood test results. Your doctor will decide when to perform blood tests and will interpret the results.

SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM			
Symptom / effect	Talk to your doctor, nurse or pharmacist		Stop taking drug and seek immediate medical help
	Only if severe	In all cases	
Common	<b>Non-melanoma skin cancer:</b> lump or discoloured patch on the skin that stays after a few weeks and slowly changes. Cancerous lumps are red/pink and firm and sometimes turn into ulcers. Cancerous patches are usually flat and scaly.	✓	
	<b>Low Blood Pressure:</b> dizziness, fainting, lightheadedness. May occur when you go from lying or sitting to standing up.	✓	
	<b>Decreased or increased levels of potassium in the blood:</b> irregular heartbeats, muscle weakness and generally feeling unwell.		✓
	<b>Chest Pain:</b>	✓	
	<b>Edema:</b> Swelling of the hands, ankles or feet.	✓	
Uncommon	<b>Allergic Reaction:</b> rash, hives, swelling of the lips, face, tongue or throat difficulty swallowing or breathing.		✓
	<b>Kidney Disorder:</b> change in frequency of urination, nausea, vomiting, swelling of extremities, fatigue.		✓
	<b>Liver Disorder:</b> yellowing of the skin or eyes, dark urine, abdominal pain, nausea, vomiting, loss of appetite.		✓
	<b>Increased blood sugar:</b> frequent urination, thirst, and hunger.	✓	
	<b>Electrolyte Imbalance:</b> weakness, drowsiness, muscle pain or cramps, irregular heartbeat.		✓

**SERIOUS SIDE EFFECTS, HOW OFTEN THEY HAPPEN AND WHAT TO DO ABOUT THEM**

Symptom / effect	Talk to your doctor, nurse or pharmacist		Stop taking drug and seek immediate medical help
	Only if severe	In all cases	
<b>Bronchitis:</b> shortness of breath, weakness, high fever, coughing and fatigue.		√	
<b>Rare</b>	<b>Sudden Kidney Failure</b> (sudden decrease or absence of urine, generalized swelling, weakness, shortness of breath, or irregular heartbeats, loss of appetite, lethargy and fatigue).		√
	<b>Rhabdomyolysis</b> muscle pain that you cannot explain, muscle tenderness or weakness, dark brown urine.	√	
	<b>Decreased White Blood Cells:</b> infections, fatigue, fever, aches, pains, and flu-like symptoms.	√	
	<b>Decreased Platelets:</b> bruising, bleeding, fatigue and weakness.	√	
<b>Very Rare</b>	<b>Toxic Epidermal Necrolysis:</b> severe skin peeling, especially in mouth and eyes.		√
<b>Unknown</b>	<b>Eye disorders:</b> - <b>Myopia:</b> sudden near sightedness or blurred vision - <b>Glaucoma:</b> increased pressure in your eyes, eye pain.		√
	<b>Anemia:</b> fatigue, loss of energy, weakness, shortness of breath.		√
	<b>Inflammation of the Pancreas:</b> abdominal pain that lasts and gets worse when you lie down, nausea, vomiting.	√	
	<b>Palpitations:</b> Irregular heartbeats.	√	
	<b>Sprue-like enteropathy:</b> severe chronic diarrhea with substantial weight loss.	√	

*HCTZ, contact your doctor or pharmacist.*

**HOW TO STORE IT**

Store at 15°C - 30°C.

Keep out of reach and sight of children.

**REPORTING SIDE EFFECTS**

You can report any suspected side effects associated with the use of health products to Health Canada by:

- Visiting the Web page on Adverse Reaction Reporting (<https://www.canada.ca/en/health-canada/services/drugs-health-products/medeffect-canada/adverse-reaction-reporting.html>) for information on how to report online, by mail or by fax; or
- Calling toll-free at 1-866-234-2345.

*NOTE: Contact your health professional if you need information about how to manage your side effects. The Canada Vigilance Program does not provide medical advice.*

**MORE INFORMATION**

If you want more information about ACH-Olmesartan HCTZ:

- Talk to your healthcare professional
- Find the full product monograph that is prepared for healthcare professionals and includes this Patient Medication Information by visiting the Health Canada website (<https://health-products.canada.ca/dpd-bdpp/index-eng.jsp>); or by calling the sponsor Accord Healthcare Inc. at 1-866-296-0354.

This leaflet was prepared by:  
Accord Healthcare Inc.  
3535 boul. St. Charles suite 704  
Kirkland, QC, H9H 5B9  
Canada

Last revised: October 24, 2019

*This is not a complete list of side effects. For any unexpected effects while taking ACH-Olmesartan*