

# Dapaflo M

## Dapagliflozin and Metformin Hydrochloride tablets

# Dapaflo M 5/500mg

# Dapaflo M 5/1000mg

**Composition:**  
**Each film coated tablet contains:**  
 Dapaflo M 500: Dapagliflozin propanediol monohydrate equivalent to Dapagliflozin 5mg and Metformin Hydrochloride BP 500mg  
 Dapaflo M 1000: Dapagliflozin propanediol monohydrate equivalent to Dapagliflozin 5mg and Metformin Hydrochloride BP 1000mg  
**Pharmaceutical form:** Film coated tablets  
**Pharmacology:** Pharmacotherapeutic group: Drugs used in diabetes, Combinations of oral blood glucose-lowering drugs, ATC code: A10BD15

**Pharmacodynamic:** Dapaflo -M tablets is a combination of two anti-hyperglycaemic medicinal products with different and complementary mechanisms of action to improve glycaemic control in patients with type 2 diabetes: Dapagliflozin, a SGLT2 inhibitor, and Metformin hydrochloride, a member of the biguanide class. Dapagliflozin is a highly potent (K<sub>i</sub>: 0.55 nM), selective and reversible inhibitor of SGLT2. The SGLT2 is selectively expressed in the kidney with no expression detected in more than 70 other tissues including liver, skeletal muscle, adipose tissue, breast, bladder and brain. SGLT2 is the predominant transporter responsible for reabsorption of glucose from the glomerular filtrate back into the circulation. Despite the presence of hyperglycaemia in type 2 diabetes, reabsorption of filtered glucose continues. Dapagliflozin improves both fasting and post-prandial plasma glucose levels by reducing renal glucose reabsorption leading to urinary glucose excretion. This glucose excretion (glucuretic effect) is observed after the first dose, is continuous over the 24-hour dosing interval and is sustained for the duration of treatment. The amount of glucose removed by the kidney through this mechanism is dependent upon the blood glucose concentration and GFR. Dapagliflozin does not impair normal endogenous glucose production in response to hypoglycaemia. Dapagliflozin acts independently of insulin secretion and insulin action. Improvement in homeostasis model assessment for beta cell function (HOMA beta-cell) has been observed in clinical studies with Dapagliflozin. Urinary glucose excretion (glucuresis) induced by Dapagliflozin is associated with caloric loss and reduction in weight. Inhibition of glucose and sodium co-transport by Dapagliflozin is also associated with mild diuresis and transient natriuresis. Dapagliflozin does not inhibit other glucose transporters important for glucose transport into peripheral tissues and is > 1,400 times more selective for SGLT2 versus SGLT1, the major transporter in the gut responsible for glucose absorption. Metformin is a biguanide with anti-hyperglycaemic effects, lowering both basal and postprandial plasma glucose. It does not stimulate insulin secretion and therefore does not produce hypoglycaemia. Metformin may act via three mechanisms:- by reduction of hepatic glucose production by inhibiting gluconeogenesis and glycogenolysis;- by modestly increasing insulin sensitivity, improving peripheral glucose uptake and utilization in muscle; and - by delaying intestinal glucose absorption. Metformin stimulates intracellular glycogen synthesis by acting on glycogen synthase. By increasing the transport capacity of specific types of membrane glucose transporters (GLUT-1 and GLUT-4), Dapagliflozin increases in the amount of glucose excreted in the urine were observed in healthy subjects and in subjects with type 2 diabetes mellitus following the administration of Dapagliflozin. Approximately 70 g of glucose was excreted in the urine per day (corresponding to 280 kcal/day) at a Dapagliflozin dose of 10 mg/day in subjects with type 2 diabetes mellitus for 12 weeks. Evidence of sustained glucose excretion was seen in subjects with type 2 diabetes mellitus given Dapagliflozin 10 mg/day for up to 2 years. This urinary glucose excretion with Dapagliflozin also results in osmotic diuresis and increases in urinary volume in subjects with type 2 diabetes mellitus. Urinary volume increases in subjects with type 2 diabetes mellitus treated with Dapagliflozin 10 mg were sustained at 12 weeks and amounted to approximately 375 mL/day. The increase in urinary volume was associated with a small and transient increase in urinary sodium excretion that was not associated with changes in serum sodium concentrations. Urinary uric acid excretion was also increased transiently (for 3–7 days) and accompanied by a sustained reduction in serum uric acid concentration. At 24 weeks, reductions in serum uric acid concentrations ranged from -48.3 to -18.3 micromoles/L (-0.87 to -0.33 mg/dL). The pharmacodynamics of 5 mg Dapagliflozin twice daily and 10 mg Dapagliflozin once daily were compared in healthy subjects. The steady-state inhibition of renal glucose reabsorption and the amount of urinary glucose excretion over a 24-hour period was the same for both dosing regimens. Metformin In humans, independently of its action on glycaemia, Metformin has favourable effects on lipid metabolism. This has been shown at therapeutic doses in controlled, medium-term or long-term clinical studies: Metformin reduces total cholesterol, LDL cholesterol and triglyceride levels. In clinical studies, use of Metformin was associated with either a stable body weight or modest weight loss.

**Pharmacokinetic:** Dapaflo M-tablet is a combination of Dapagliflozin and Metformin hydrochloride administered together as individual tablets. The pharmacokinetics of 5 mg Dapagliflozin twice daily and 10 mg Dapagliflozin once daily were compared in healthy subjects. Administration of 5 mg Dapagliflozin twice daily gave similar overall exposures (AUCs) over a 24-hour period as 10 mg Dapagliflozin administered once daily. As expected, Dapagliflozin 5 mg administered twice daily compared with 10 mg Dapagliflozin once daily resulted in lower peak Dapagliflozin plasma concentrations (C<sub>max</sub>) and higher trough plasma Dapagliflozin concentrations (C<sub>min</sub>). The mean resulted in a delay of 1 to 2 hours in the peak concentrations and a decrease in the maximum plasma concentration of 29% of Dapagliflozin and 17% of Metformin. Dapagliflozin was rapidly and well absorbed after oral administration. Maximum Dapagliflozin plasma concentrations (C<sub>max</sub>) were usually attained within 2 hours after administration in the fasted state. Geometric mean steady-state Dapagliflozin C<sub>max</sub> and AUC<sub>0-∞</sub> were following once daily 10 mg doses of Dapagliflozin were 158 ng/mL and 628 ng h/mL, respectively. The absolute oral bioavailability of Dapagliflozin following the administration of a 10 mg dose is 78%, approximately 91% protein bound. Protein binding was not altered in various disease states (e.g. renal or hepatic impairment). It's extensively metabolized, primarily to yield Dapagliflozin 3-O-glucuronide, which is an inactive metabolite. Dapagliflozin 3-O-glucuronide or other metabolites do not contribute to the glucose-lowering effects. The formation of Dapagliflozin 3-O-glucuronide is mediated by UGT1A9, an enzyme present in the liver and kidney, and CYP-mediated metabolism was a minor clearance pathway. The mean plasma terminal half-life (t<sub>1/2</sub>) for Dapagliflozin was 12.9 hours following a single oral dose of Dapagliflozin 10 mg to healthy subjects. Dapagliflozin and related metabolites are primarily eliminated via urinary excretion with less than 2% as unchanged Dapagliflozin. After administration of a 50 mg [14C]-Dapagliflozin dose, 96% was recovered, 75% in urine and 21% in faeces. In faeces, approximately 15% of the dose was excreted as parent drug.

**Renal impairment:** At steady-state (20 mg once-daily Dapagliflozin for 7 days), subjects with type 2 diabetes mellitus and mild, moderate or severe renal impairment (as determined by iohexol plasma clearance) had mean systemic exposures of Dapagliflozin of 32%, 60% and 87% higher, respectively, than those of subjects with type 2 diabetes mellitus and normal renal function. The steady-state 24-hour urinary glucose excretion was highly dependent on renal function and 85, 52, 18 and 11 g of glucose/day was excreted by subjects with type 2 diabetes mellitus and normal renal function or mild, moderate or severe renal impairment, respectively. The impact of haemodialysis on Dapagliflozin exposure is not known.

**Hepatic impairment:** In subjects with mild or moderate hepatic impairment (Child-Pugh classes A and B), mean C<sub>max</sub> and AUC of Dapagliflozin were up to 12% and 36% higher, respectively, compared with healthy matched control subjects. These differences were not considered to be clinically meaningful. In subjects with severe hepatic impairment (Child-Pugh class C) mean C<sub>max</sub> and AUC of Dapagliflozin were 40% and 67% higher than matched healthy controls, respectively.

Elderly (≥ 65 years): There is no clinically meaningful increase in exposure based on age alone in subjects up to 70 years old. However, an increased exposure due to age-related decrease in renal function can be expected. There are insufficient data to draw conclusions regarding exposure in patients > 70 years old. The mean Dapagliflozin AUCs in females was estimated to be about 22% higher than in males. Dapagliflozin exposure was found to decrease with increased weight. Consequently, low-weight patients may have somewhat increased exposure and patients with high weight somewhat decreased exposure. However, the differences in exposure were not considered clinically meaningful. Pharmacokinetics in the paediatric population have not been studied.

**Absorption:** After an oral dose of Metformin, t<sub>max</sub> is reached in 2.5 h. Absolute bioavailability of a 1000 mg or 850 mg Metformin tablet is approximately 50-60% in healthy subjects. After an oral dose, the non-absorbed fraction recovered in faeces was 20-30%. After oral administration, Metformin absorption is saturable and incomplete. It is assumed that the pharmacokinetics of Metformin absorption is non-linear. At the usual Metformin doses and dosing schedules, steady-state plasma concentrations are reached within 24-48 hours and are generally less than 1 µg/mL. In controlled clinical trials, maximum Metformin plasma levels (C<sub>max</sub>) did not exceed 5 µg/mL, even at maximum doses. Distribution Plasma protein binding is negligible. Metformin partitions into erythrocytes. The blood peak is lower than the plasma peak and appears at approximately the same time. The red blood cells most likely represent a secondary compartment of distribution. The mean V<sub>d</sub> ranged between 63-276 l.

**Biotransformation:** Metformin is excreted unchanged in the urine. No metabolites have been identified in humans.

**Elimination:** Renal clearance of Metformin is > 400 mL/min, indicating that Metformin is eliminated by glomerular filtration and tubular secretion. Following an oral dose, the apparent terminal elimination half-life is approximately 6.5 hours.

In patients with decreased renal function (based on measured creatinine clearance), the plasma and blood half-life of Metformin is prolonged and the renal clearance is decreased in proportion to the decrease in creatinine clearance, leading to increased levels of Metformin in plasma. Therapeutic indications : Dapaflo M tablet is indicated in adults for the treatment of type 2 diabetes mellitus as an adjunct to diet and exercise:- In patients insufficiently controlled on their maximally tolerated dose of Metformin alone, - In combination with other medicinal products for the treatment of diabetes in patients insufficiently controlled with Metformin and these medicinal products,- In patients already being treated with the combination of Dapagliflozin and Metformin as separate tablets.

-For study results with respect to combination of therapies, effects on glycaemic control and cardiovascular events, and the populations studied. Posology and method of administration

**Method of administration:** For oral administration, Dapaflo M tablet should be given with meals.

**Posology:** Adults with normal renal function (glomerular filtration rate [GFR] ≥ 90 mL/min): The recommended dose is one tablet twice daily. Dosing may be adjusted based on effectiveness and tolerability while not exceeding the maximum recommended daily dose of 10 mg Dapagliflozin and 2000mg Metformin HCl

For patients insufficiently controlled on Metformin monotherapy or Metformin in combination with other medicinal products for the treatment of diabetes

Patients insufficiently controlled on Metformin alone or in combination with other medicinal products for the treatment of diabetes should receive a total daily dose of Dapagliflozin 10 mg, plus the total daily dose of Metformin, or the nearest therapeutically appropriate dose, already being taken.

When used in combination with insulin or an insulin secretagogue such as sulphonylurea, a lower dose of insulin or sulphonylurea may be considered to reduce the risk of hypoglycaemia

For patients switching from separate tablets of Dapagliflozin and Metformin

Patients switching from separate tablets of Dapagliflozin (10 mg total daily dose) and Metformin to Dapaflo M tablet should receive the same daily dose of Dapagliflozin and Metformin already being taken or the nearest therapeutically appropriate dose of Metformin.

Renal impairment: A GFR should be assessed before initiation of treatment with Metformin containing medicinal products and at least annually thereafter. In patients at increased risk of further progression of renal impairment and in the elderly, renal function should be assessed more frequently, e.g. every 3-6 months. The maximum daily dose of Metformin should preferably be divided into 2-3 daily doses.

Factors that may increase the risk of lactic acidosis should be reviewed before considering initiation of Metformin in patients with GFR < 60 mL/min.

**Contraindications:** Dapaflo M-tablet is contraindicated in patients with:  
 Hypersensitivity to the active substances or to any of the excipients, - Any type of acute metabolic acidosis (such as lactic acidosis, diabetic ketoacidosis), - Diabetic pre-coma, - Severe renal failure (GFR < 30 mL/min), - Acute conditions with the potential to alter renal function such as:- Dehydration, severe infection, shock; Acute or chronic disease which may cause tissue hypoxia such as: Cardiac or respiratory failure, Recent myocardial infarction, Shock; Hepatic impairment, Acute alcohol intoxication, alcoholism, Pregnancy and Breast-feeding.

Special warnings and precautions for use: Metformin accumulation occurs at acute worsening of renal function and increases the risk of lactic acidosis. Lactic acidosis is characterized by acidotic dyspnoea, abdominal pain, muscle cramps, asthenia and hypothermia followed by coma. In case of suspected symptoms, the patient should stop taking Dapaflo M-tablet and seek immediate medical attention. Diagnostic laboratory findings are decreased blood pH (<7.35), increased plasma lactate levels above 5 mmol/L, and an increased anion gap and lactate/pyruvate ratio. In case of dehydration (severe diarrhoea or vomiting, fever or reduced fluid intake), Dapaflo M tablet should be temporarily discontinued

and contact with a health care professional is recommended. Medicinal products that can acutely impair renal function (such as antihypertensives, diuretics and non-steroidal anti-inflammatory drugs [NSAIDs]) should be initiated with caution in Metformin-treated patients. Dapaflo M tablet should not be initiated in patients with GFR < 60 mL/min and should be discontinued at GFR persistently below 5 mL/min. Metformin is excreted by the kidney, and moderate to severe renal insufficiency increases the risk of lactic acidosis. Renal function should be assessed: Before initiation of treatment and regularly thereafter. For renal function with GFR levels < 60 mL/min and in elderly patients, at least 2 to 4 times per year. Prior to initiation of concomitant medicinal products that may reduce renal function and periodically thereafter, if renal function falls persistently below GFR 45 mL/min, treatment should be discontinued and Metformin is contraindicated in patients with GFR of < 30 mL/min and should be temporarily discontinued in the presence of conditions that alter renal function. Special caution should be exercised in situations where renal function may become impaired, for example when initiating anti-hypertensive or diuretic therapy or when starting treatment with a NSAID. Dapagliflozin increases diuresis which may lead to the modest decrease in blood pressure observed in clinical studies. It may be more pronounced in patients with high blood glucose concentrations. Caution should be exercised in patients for whom a Dapagliflozin-induced drop in blood pressure could pose a risk, such as patients on anti-hypertensive therapy with a history of hypotension or elderly patients. In case of intercurrent conditions that may lead to volume depletion (e.g. gastrointestinal illness), careful monitoring of volume status (e.g. physical examination, blood pressure measurements, laboratory tests including haematocrit and electrolytes) is recommended. Temporary interruption of treatment with this medicinal product is recommended for patients who develop volume depletion until the depletion is corrected. Rare cases of diabetic ketoacidosis (DKA), including life-threatening and fatal cases, have been reported in patients treated with sodium-glucose co-transporter 2 (SGLT2) inhibitors, including Dapagliflozin. The risk of diabetic ketoacidosis must be considered in the event of non-specific symptoms such as nausea, vomiting, anorexia, abdominal pain, excessive thirst, difficulty breathing, confusion, unusual fatigue or sleepiness. Patients should be assessed for ketoacidosis immediately if these symptoms occur, regardless of blood glucose level. In patients where DKA is suspected or diagnosed, treatment with Dapagliflozin should be discontinued immediately. Treatment should be interrupted in patients who are hospitalised for major surgical procedures or acute serious medical illnesses. Monitoring of ketones is recommended in these patients. Measurement of blood ketone levels is preferred to urine AD. Treatment may be restarted when the ketone values are normal and the patient's condition has stabilized. Before initiating Dapagliflozin, factors in the patient history that may predispose to ketoacidosis should be considered. Patients who may be at higher risk of DKA include patients with a low beta-cell function reserve (e.g. type 2 diabetes patients with low C-peptide or latent autoimmune diabetes in adults (LADA) or patients with a history of pancreatitis), patients with conditions that lead to restricted food intake or severe dehydration, patients for whom insulin doses are reduced and patients with increased insulin requirements due to acute medical illness, surgery or alcohol abuse. SGLT2 inhibitors should be used with caution in these patients. Cases of necrotising fasciitis of the perineum (also known as Fournier's gangrene) have been reported in female and male patients taking SGLT2 inhibitors. This is a rare but serious and potentially life threatening event that requires urgent surgical intervention and antibiotic treatment. Patients should be advised to seek medical attention if they experience a combination of symptoms of pain, tenderness, erythema, or swelling in the genital or perineal area, with fever or malaise. If Fournier's gangrene is suspected, Dapaflo -M tablets should be discontinued and prompt treatment (including antibiotics and surgical debridement) should be instituted.

**Urinary tract infections:** Urinary glucose excretion may be associated with an increased risk of urinary tract infection; therefore, temporary interruption of treatment should be considered when treating pyelonephritis or urosepsis.

**Elderly (≥ 65 years):** May be at a greater risk for volume depletion and are more likely to be treated with diuretics. Elderly patients are more likely to have impaired renal function, and/or to be treated with anti-hypertensive medicinal products that may cause changes in renal function such as angiotensin-converting enzyme inhibitors (ACE-I) and angiotensin II type 1 receptor blockers (ARB). The same recommendations for renal function apply to elderly patients as to all patients

**Cardiac failure:** There is no experience in clinical studies with Dapagliflozin in NYHA class IV. Lower limb amputations: An increase in cases of lower limb amputation (primarily of the toe) has been observed in ongoing long-term, clinical studies with another SGLT2 inhibitor. It is unknown whether this constitutes a class effect. Like for all diabetic patients it is important to counsel patients on routine preventative foot care.

**Urine laboratory assessments:** Due to its mechanism of action, patients taking this medicinal product will test positive for glucose in their urine.

**Administration of iodinated contrast agents:** Intravascular administration of iodinated contrast agents may lead to contrast induced nephropathy, resulting in Metformin accumulation and increased risk of lactic acidosis. Dapaflo -M tablet should be discontinued prior to, or at the time of, the imaging procedure and not restarted until at least 48 hours after, provided that renal function has been re-evaluated and found to be stable. Dapaflo -M tablet must be discontinued at the time of surgery with general, spinal or epidural anaesthesia. Therapy may be restarted no earlier than 48 hours following surgery or resumption of oral nutrition and provided that renal function has been re-evaluated and found to be stable. Change in clinical status of patients with previously controlled type 2 diabetes. As this medicinal product contains Metformin, a patient with type 2 diabetes previously well-controlled on it who develops laboratory abnormalities or clinical illness (especially vague and poorly defined illness) should be evaluated promptly for evidence of ketoacidosis or hyperglycaemia. Evaluation should include serum electrolytes and ketones, blood glucose and, if indicated, blood pH, lactate, pyruvate, and Metformin levels. If acidosis of either form occurs, treatment must be stopped immediately and other appropriate corrective measures initiated.

Interaction with other medicinal products and other forms of interaction: Dapagliflozin may add to the diuretic effect of thiazide and loop diuretics and may increase the risk of dehydration and hypotension. Insulin and insulin secretagogues, such as sulphonylureas, cause hypoglycaemia. The metabolism of Dapagliflozin is primarily via glucuronid conjugation mediated by UDP-gluconyltransferase 1A9 (UGT1A9). Dapagliflozin neither inhibited cytochrome P450 (CYP) 1A2, CYP2A6, CYP2B6, CYP2C8, CYP2C9, CYP2C19, CYP2D6, CYP3A4, nor induced CYP1A2, CYP2B6 or CYP3A4. Pharmacokinetics of Dapagliflozin are not altered by pioglitazone, sitagliptin, glimepiride, voglibose, dihydrochlorothiazide, bumetanide, valsartan, or simvastatin.

Co-administration of Dapagliflozin with rifampicin (an inducer of various active transporters and drug-metabolising enzymes) a 22% decrease in Dapagliflozin systemic exposure (AUC) was observed, but with no clinically meaningful effect on 24-hour urinary glucose excretion. No dose adjustment is recommended. A clinically relevant effect with other inducers (e.g. carbamazepine, phenytoin, and phenobarbital) is not expected. Following co-administration of Dapagliflozin with metforminic acid (an inhibitor of UGT1A9), a 55% increase in Dapagliflozin systemic exposure was seen, but with no clinically meaningful effect on 24-hour urinary glucose excretion. No dose adjustment is recommended. Dapagliflozin does not alter the pharmacokinetics of pioglitazone, sitagliptin, glimepiride, dihydrochlorothiazide, bumetanide, valsartan, digoxin (a P-gp substrate) or warfarin (S-warfarin, a CYP2C9 substrate), or the anti-coagulatory effects of warfarin as measured by INR. Combination of a single dose of Dapagliflozin 20 mg and simvastatin (a CYP3A4 substrate) resulted in a 19% increase in AUC of simvastatin and 31% increase in AUC of simvastatin acid. The increase in simvastatin and simvastatin acid exposures are not considered clinically relevant. Monitoring glycaemic control with 1,5-AG assay is not recommended as measurements of 1,5-AG are unreliable in assessing glycaemic control in patients taking SGLT2 inhibitors. Use of alternative methods to monitor glycaemic control is advised.

**Metformin:** Cationic substances that are eliminated by renal tubular secretion (e.g. cimetidine) may interact with Metformin by competing for common renal tubular transport systems. Cimetidine, administered as 400 mg twice daily, increased Metformin systemic exposure (AUC) by 50% and C<sub>max</sub> by 81%. , close monitoring of glycaemic control, dose adjustment within the recommended posology and changes in diabetic treatment should be considered when cationic medicinal products that are eliminated by renal tubular secretion are co-administered. Alcohol intoxication is associated with an increased risk of lactic acidosis, particularly in the case of fasting, malnutrition or hepatic impairment due to the Metformin active substance of this medicinal product. Consumption of alcohol and medicinal products containing alcohol should be avoided. Intravascular administration of iodinated contrast agents may lead to contrast induced nephropathy, resulting in Metformin accumulation and increased risk of lactic acidosis. Dapaflo -M tablets must be discontinued prior to, or at the time of the imaging procedure and not restarted until at least 48 hours after, provided that renal function has been re-evaluated and found to be stable. Glucocorticoids (given by systemic and local routes), beta-2 agonists, and diuretics have intrinsic hyperglycaemic activity. The patient should be informed and more frequent blood glucose monitoring performed, especially at the beginning of treatment with such medicinal products. If necessary, the dose of the glucose-lowering medicinal product should be adjusted during therapy with the other medicinal product and on its discontinuation. Some medicinal products can adversely affect renal function which may increase the risk of lactic acidosis, e.g. NSAIDs, including selective cyclo-oxygenase (COX) II inhibitors, ACE inhibitors, angiotensin II receptor antagonists and diuretics, especially loop diuretics. When starting or using such products in combination with Metformin, close monitoring of renal function is necessary. Insulin and insulin secretagogues, such as sulphonylureas, cause hypoglycemia to remove Metformin and lactate is haemodialysis. Dapagliflozin did not show any toxicity in healthy subjects at single oral doses up to 1000 mg (50 times the maximum recommended human dose). In the event of an overdose, appropriate supportive treatment should be initiated as dictated by the patient's clinical status. High overdose or concomitant risks of Metformin may lead to lactic acidosis. Lactic acidosis is a medical emergency and must be treated in hospital.

**Shelf life:** 2 years from the date of manufacture.  
**Storage:** Do not store above 30°C, Protect from direct sunlight.  
 Keep all medicines out of reach of children.

**Nature and contents of container:**  
 Alu-Alu Blister Pack of 3x 10's packed in printed unit carton.

Manufactured by: **Dawa Limited**  
 Plot No. 7879/8, P. O. BOX 16633 - 00620,  
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 Nairobi, Kenya.



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