

## Metformin (Glucophage)

Metformin functions by decreasing glucose production and increasing insulin sensitivity. It is recommended for the treatment of Type 2 diabetes, gestational diabetes, and polycystic ovary syndrome (PCOS). Metformin is associated with minimal side effects, including nausea, diarrhea, decreased appetite, and lactic acidosis. Alcohol intake and IV contrast agents should be used with caution when metformin is administered.



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### Mechanism

#### Decrease Glucose Production

[Down-arrow Glue](#)

Metformin is an oral hypoglycemic drug that decreases the production of glucose within the liver and increases the sensitivity of existing insulin by action on the target cells

#### Increase Insulin Sensitivity

[Up-arrow Insect-syringe Crying](#)

Metformin works by decreasing the production of glucose and reducing resistance to existing insulin.

### Indications

#### Type 2 Diabetes

[Dyed-bead-pancreas in \(2\) Tutu](#)

Metformin is the recommended drug for the initial treatment of Type 2 diabetes and gestational diabetes because it decreases the production of glucose and increases the sensitivity of insulin. Generally, metformin is started if diet and exercise modifications have not been effective for the management of Type 2 diabetes.

#### Polycystic Ovary Syndrome (PCOS)

[Peacock with PCOS](#)

Polycystic Ovary Syndrome (PCOS) is characterized by excess androgens and increased insulin resistance. Metformin has been found to be effective in treating PCOS, as it increases the sensitivity of insulin. The outcome of this response is improved glucose tolerance, improved ovulatory menstrual cycles, and increased pregnancy rates.

### Side Effects

#### GI Distress

[GI with Flare-gun](#)

Because metformin functions in the liver to decrease the production of glucose, it often causes gastrointestinal symptoms, including nausea, diarrhea, decreased appetite, and lactic acidosis. Further, metformin reduces the absorption of folic acid and vitamin B12 and may lead to vitamin deficiency.

## Decreased Appetite

[X on Mouth](#)

Metformin works by decreasing glucose production, increasing insulin sensitivity, and may decrease appetite, leading to weight loss.

## Lactic Acidosis

[Lake of Acidic-lemon](#)

Lactic acidosis is a rare side effect of metformin and is indicative of drug toxicity. This side effect occurs because metformin inhibits the normal oxidation of lactic acid, which promotes the development of lactic acidosis. Patients taking metformin should be assessed for signs of lactic acidosis, which include hyperventilation, malaise, myalgia, and somnolence. Because these symptoms may present as subtle, and non specific, ensure to monitor the patient closely should these signs occur. Lactic acidosis is considered a medical emergency requiring hospital treatment.

## Considerations

### IV Contrast

[IV-bag and Contrasting-con](#)

Metformin should be held 1-2 days before the use of IV contrast agents and 48 hours after administration. IV contrast agents contain iodine, which can promote renal failure and further exacerbate lactic acidosis.

### Limit Alcohol Consumption

[Limiting Alcoholic-martini](#)

Alcohol should be limited in patients taking metformin. Alcohol further limits the breakdown of lactic acidosis and, therefore, promotes and intensifies metformin-induced lactic acidosis.