Metformin Hydrochloride (Glucophage)
Patient Information, EDI

Definitions:
Metformin (*Glucophage*) is a medication designed to lower blood sugar levels.

Indications:
Metformin is indicated, in addition to weight reduction and a sensible diet, to lower blood glucose levels in patients with Type II Non-Insulin-Dependent Diabetes Mellitus (NIDDM).

While not FDA approved for this indication, Metformin may help patients with Poly Cystic Ovarian Syndrome (PCOS) control elevated insulin (insulin resistance) and glucose (glucose intolerance) levels. The excess insulin stimulates the ovary to produce male hormones, which in turn, results in the PCOS problems. Metformin may play a significant role in the treatment of PCOS patients.

Anatomy/Physiology/Mode of Action:
Patients with insulin resistance are unable to fully utilize the insulin their body produces in combination with the glucose they consume. Without treatment, the elevated levels of insulin and glucose can result in hypertension, heart disease, abnormal uterine bleeding, abnormal hair growth, acne, uterine cancer and even infertility. Metformin works though a number of mechanisms:

1. It reduces glucose production from the liver which reduces both glucose and insulin levels (primary mode of action)
2. Decreases the intestinal absorption of glucose
3. Improves insulin sensitivity by increasing glucose cellular uptake and utilization
4. Decreases total cholesterol, triglycerides and LDL while leaving the “good” cholesterol levels essentially unchanged or even slightly improved
5. Decreases high blood pressure (hypertension)
6. Induces weight reduction

Contraindications To Taking The Medications:
Absolute Contraindications:
Metformin is to be given carefully in patients with known kidney or heart disease.
Metformin should not be given to patients with an allergy to the drug.

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Relative Contraindications:
Alcohol should be minimized while taking this drug.

Adverse Drug Effects:

1. About 30% of the patients will experience some level of diarrhea, nausea, vomiting, abdominal bloating, gas or loss of appetite when first starting the medication. The symptoms generally resolve within a couple of weeks with only 4% of the patients having to stop the medication because of intestinal upset. Minimizing your carbohydrate intake often reduces the severity of these symptoms.
2. If you are to undergo a hysterosalpingogram (HSG), please do not take Metformin during the day prior, the day of, and the two days following the HSG (total of four days). This same precaution should be used if any other studies with iodinated contrast materials or major surgical procedures are to be performed.
3. Because the medication is excreted though the kidneys, it is important to stay well hydrated in the hot Florida sun to keep levels of the drug from building up.
4. There is a rare complication that can occur called lactic acidosis. This complication is seen in only 1 out of 33,000 patients who take the drug for one year. This severe complication generally occurs in older patients, that are truly diabetic and suffering from kidney disease. The symptoms include extreme weakness, feeling tired or uncomfortable, unusual muscle pain, trouble breathing, unusual or unexpected stomach discomfort, feeling cold, dizzy or lightheaded and a slow or irregular heartbeat. Please understand that one should have a number of the above symptoms before being concerned with lactic acidosis. Realistically, the chances of developing lactic acidosis may be non-existent in the patient population here at Embryo Donation International (EDI).

Drug Interactions:

1. The interaction with other medications is minimal
2. Metformin seems to be slightly better tolerated when taken with food. It may also be best for the patient to take a prenatal or multivitamin each day while taking this medication.

Pregnancy:

Metformin has not been found to produce abnormalities in newborn humans, rats or rabbits (Class B). The placenta seems to form a partial barrier to the drug. Your physician may feel that it is best that you take this medication during early pregnancy. Theoretically, Metformin may reduce sugar levels which, when elevated, are associated with fetal malformations. Breast feeding concerns will need to be discussed with your Pediatrician.

Where Can I Find Out More About The Drug?

Package insert and the following sites on the WEB:
http://www.ncbi.nlm.nih.gov/PubMed/ (input “metformin and polycystic ovarian disease”)

Dosage & Administration:

Because intestinal disturbances are seen in one-third of the patients, it is suggested that you take the medications in the following manner:

Week 1: 500 mg., one pill with the evening meal
Week 2: 500 mg., one pill twice each day with morning and evening meals
Week 3: 500 mg., one pill three times each day with meals (this is the standard dose taken every day)

If necessary, your physician may increase your dose to 850 mg three times per day.