

pancreas to release insulin. The choice of drug prescribed depends on the patient's individual problem. These medications are categorized as first- or second-generation, based on when they were released. First-generation sulfonylurea antihyperglycemic medications include acetohexamide (Dymelor), chlorpropamide (Diabinese), tolazamide (Tolinase), and tolbutamide (Orinase). The major drawback to the first-generation medications is that they can be dislodged from the proteins they bind to by other drugs, leading to very serious and prolonged hypoglycemia. The newer second-generation sulfonylurea antihyperglycemic medications are more potent and tend to be safer because they are not so easily dislodged. They include glimepiride (Amaryl), glipizide (Glucotrol), and glyburide (Diabeta, Micronase Glynase).

In addition, there are multiple other categories of antihyperglycemics. Sodium-glucose cotransporter 2 (SGLT-2) inhibitors such as empagliflozin (Jardiance), canagliflozin (Invokana), and dapagliflozin (Forxiga, Farxiga) inhibit the absorption of glucose by the kidneys. Dipeptidyl Peptidase-4 (DPP-4) inhibitors such as linagliptin (Tranjeta), sitagliptin (Januvia), and anagliptin (Suiny) inhibit DPP-4, an enzyme that inactivates incretion hormones GLP-1 and GIP (Drug Spotlight 15.1). Glucagon-like glucosidase peptide 1 (GLP-1) inhibitors such as liraglutide (Victoza) and dulaglutide (Trulicity) decrease blood glucose levels without causing hypoglycemia. Biguanides such as metformin improve peripheral glucose utilization. Thiazolidinediones (glitazones) such as rosiglitazone (Avandia) and pioglitazone (Actos) improve insulin sensitivity. Meglitinides such as nateglinide (Starlix) and repaglinide (Prandin, NovoNrom) stimulate insulin secretion from the pancreas, lowering glucose levels.

It is important to understand the types of insulin, its proper handling, and its proper injection to care safely for patients with diabetes mellitus.



CRITICAL THINKING

Why may too much glucose in the blood affect wound healing and nerve health?



CRITICAL THINKING

What would you do if a patient with diabetes mellitus came to your office and collapsed in the waiting room?

Types of Insulin

Insulin preparations are divided into five categories based on how quickly they start working and the length of action: rapid-acting, short-acting, intermediate-acting, long-acting, and premixed insulin preparations (Table 15-3). When a patient's blood glucose level is high, you may need to use short-acting insulin to lower it. Short-acting insulin is usually prescribed on a sliding scale, depending on the assessed blood glucose level. It may also be taken before meals so that it starts to work as food is being

Drug Spotlight 15-1 Sitagliptin (Januvia)

Availability	25-, 50-, and 100-mg tablets
Indications	Type 2 diabetes mellitus in combination with diet and exercise to improve control of glucose levels
Action	Helps to increase two hormones found in body that help control glucose levels (GLP-1 and GIP).
Adverse Reactions/ Side Effects	Body aches or pain, muscle aches, cough, loss of voice, rhinorrhea, stuffy nose, sneezing, ear congestion, fever, difficulty breathing, sore throat, abdominal pain, diarrhea
Contraindications	Hypersensitivity reaction to sitagliptin