

# [Patients of medication to treat blood glucose levels](https://assignbuster.com/patients-of-medication-to-treat-blood-glucose-levels/)

Patients living with diabetes mellitus are eitherinclined to insulin resistance or when insufficient insulin is produced fromthe pancreas, resulting to hyperglycaemia and leading to various microvascularand macrovascular complications including ‘ hypertension’ 1-2. This assignmentwill demonstrate the use of two classes of medication to treat blood glucose levelsand hypertension. Medication forBlood Glucose Control 1. Metformin(Biguanides)Mode of Action Metformin is an antidiabetic drug thatcontains the ingredient metformin hydrochloride, which belongs to the chemical drugclass of biguanide 3. Metformin is the first line and initial drug therapy prescribedspecifically to newly diagnosed patients living with type 2 diabetes, especially overweight and obese patients who don’t have adequate control over theirdiet and exercise or are not feasible, which results in uncontrolled bloodglucose 4-5. Metformin medication helps promote normal blood sugar levels andhelps maintain it constantly 4, 6.

This is enhanced by reducing the quantityof glucose from the liver that’s released into the bloodstream and declines theamount of glucose captivated by the intestines; therefore, making the bodycells become more adequate and responsive to insulin and enhances thesensitivity mechanisms of the muscle cells to insulin 4, 7-8. Metformin alsoutilises its constructive effects on glycaemic control, by enhancing peripheraland hepatic sensitivity to insulin 9-11 and can enhance modest weight loss orkeep current weight stable 12. Metformin alone works to decrease postprandialblood glucose, fasting plasma glucose, HbA1c levels and prevents hypoglycaemia episodes13. Metformin medication initially starts from taking once daily dose with breakfast; the dose then steadily increases to 2-3 times a day with main meals 14-15.        Side Effects Common side effects with metformin areusually: drowsiness, dizziness, tiredness, muscle pains and cramps, abdominal discomfort, vomiting, diarrhea and nausea; not all of these side effects may manifest 16. Lactic acidosis is the most serious side effect that’s predominately due toaccumulation of metformin in the body but it’s very rare this side effect occurs17.  Cautions Several precautions should be taken accountwhen prescribing metformin. Patients with kidney complications could sufferfrom lactic acidosis due to higher quantities of metformin in the system, resulting in the kidneys unable to function adequately 17-18.

Secondly, patients with heart complications shouldn’t take metformin due to the heartunable to send sufficient amount of blood to the kidneys, which stops thekidneys from eliminating metformin from the body, resulting in the risk of lacticacidosis 17. However, GP’s may test the kidneys and prescribe metformin if appropriate17. Drinking high amounts of alcohol alongside metformin could cause lacticacidosis and hypoglycaemia; thus, it’s vital to educate patients towardsalcohol health effects whilst taking metformin 17.  Monitoring Metformin can predispose to vitamin B12deficiency, resulting in homocysteine concentrations 18.

However, this can bepreventable and regular measurements of vitamin B12 monitoring should beconsidered during long-term metformin therapy 18. It’s vital to identify ifpatients have any allergic reaction to metformin ingredients before prescribing19. Counselling points It’s important to counsel patients to take metforminat the same time everyday with meals 20. Secondly, making patients aware ofhypoglycaemia and how to overcome low sugar levels. Even though metformin isunlikely to cause hypoglycaemia, other medications patients may take alongsidemetformin may predispose to low sugar levels, therefore its important to makepatients aware to monitor blood sugar levels regularly, especially beforedriving and exercising 20.  Lastly, itsimportant that patients are aware of all minor and major side effects (especiallylactic acidosis) with metformin and explain what actions should be consideredif these side effects arise 16-17. 2. Sitagliptins (DPP-4Inhibitors) Sitagliptin is an anti-diabetic drug of thedipeptidyl peptidase-4 (DPP-4) inhibitor medication class, which is generallyprescribed to patients living with type 2 diabetes mellitus to help lower bloodsugar levels, which can also be combined with other anti-diabetic drugs e.

g. metformin 21.  Mode of Action Sitagliptins main role is to block theaction of DPP-4, which is an enzyme that predominantly destroys gastrointestinalhormone incretins. Incretins is a hormone which produces insulin when it’srequired (after eating) and decreases the production of glucagon by the liverorgan when it’s isn’t necessary (during digestion) 22. Glucagon-likepeptide-1 (GLP-1) and glucose-dependent insulinotropic peptide (GIP) supportthe action of incretin 23. Patients living with diabetes mellitus do not makesufficient amount of incretin than individuals without diabetes 24.  Thus, Sitagliptin medication plays its part byinhibiting DPP-4 that essentially supports the hormone incretin to stay longerin the body, which helps improves meal enthused active GLP-1 AND GIP levelsapproximately two to threefold 25.

A single dose of 100mg of sitagliptin providespersistent 24-hour prevention of DPP-4 enzyme, which increases activation ofGLP-1 and GIP prominent to increase in insulin and C-peptide decline glucogons, which improves in oral glucose tolerance 26. As a result, this inclines insulin to be released thathelps lower blood glucose levels to a healthy range, slows down digestion anddecreases appetite 24-27. DPP-4 inhibitor (Sitagliptin) can help lower HbA1cto approximately by 0. 5% – 0. 8% 28.

Side Effects There are many adverse side effects thatmanifest with sitagliptins (DPP-4) such as: headaches, diarrhoea, nausea, stomach pains, sore throat, skin reactions may manifest and can increase riskof pancreatitis (constant abdominal pain) which disposes to vomiting and nausea22.       Monitoring Inform patients to consider regular physicalexaminations e. g.

blood tests, urine tests to be certain that any medication(in this case: DPP-4 medications) are not causing any severe adverse effects tothe patients health and be confident that the prescribed medication is suitedto the patient effectively 29. Doctors would monitor kidney function with patientswith renal complications and may prescribe lower dosages (normally 25 – 50mg)30-31.  Cautions DPP-4 medication should not be prescribedas first line of diabetes therapy but second e. g.

after metformin. 30-31. Sitagliptinsshould not be prescribed to patients living with type 1 diabetes for treatingdiabetes ketoacidosis 32. Sitagliptins is associated with acute pancreatitisdiscomfort; health care professions should inform patients about severeabdominal discomfort and if suspected sitagliptins should be discontinuedstraight away as well as any allergic reactions 32. Patients with a historyof pancreatitis, cautions should be used straight away 32. There is a dosageorder for sitagliptins when prescribed to patients with renal complications, therefore, patients need to take renal function assessments before being prescribedsitagliptins amongst other anti-diabetic medication and should be assessed againafter being prescribed a suitable dose, in order to keep track of renalfunction 32.  Counselling Points Counselling patients to take sitagliptinregularly with the prescribed dose given, if patients accidently missed a doseit should be taken as soon as possible 33. If it’s nearer to the next dose, patients should eliminate double dose and get back to regular dosing agenda33.

Medication forBlood Pressure Control 1. Acebutolol (BetaBlockers) Mode of Action Acebutolol is a medication belongs to thegroup of medicines of beta-blockers to treat hypertension and irregular heartbeat that works on the heart and blood vessels 34. Acebutolol works byslowing down the action of the heart by preventing messages sent by the nerveto the heart 34-35. This is by blocking the beta-adrenergic receptors wherethe messages are acknowledged by the heart, which results in the heart beatingmore slowly with essentially less force that support blood vessels and theheart to stay relaxed 34-35. This therefore, reduces hypertension by decreasingthe pressure of blood within the blood vessels and because the heart is usinglesser energy it also supports to reduce chest pains if patients suffer fromangina; also works to lower heart rate and for the hearts request for oxygen 34-35.

Side Effects Like any other medication, acebutolol hasmany side effects and the most common ones are: headaches, blurred vision, dizziness, diarrehea, indigestion, fatigue and muscle pains 34-35. When bloodpressure and heart rate is low, patients could suffer from severe dizziness andfainting, therefore patients may need medication attention 35. Monitoring NICE guidelinessuggest health care professions should monitor lung and kidney function forpatients who have a history of airway and renal disease before prescribingacebutolol 36. This is to monitor if these organs are working well, whichwould help decide if this drug would be safe to use and also if the dose needsto be lowered 35-36.        Cautions Before prescribing acebutolol to femalepatients, health care professions should examine if they are pregnant orplanning to get pregnant, as acebutolol shouldn’t be used during pregnancy becauseit could cause a harmful risk to the unborn baby 35. Patients with asthma, heart, hyperthyroidism and renal deficiencies; doctors would either putpatients on a small dose of acebutolol with a caution, change the medication orcompletely avoid it depending on the situation 35-36. Special cautions shouldbe suggested to patients with a history of hypersensitivity, as beta-blockerscould cause sensitivity to allergic reactions, which could cause severehypersensitivity reactions 36.

Counselling Points Counselling patients to take thismedication regularly as prescribed and don’t stop this medication suddenly, asit could incline patients to hypertension and other heart related disorders37. Patients living with diabetes mellitus should regularly monitor theirblood glucose levels, as this medication could possibly predispose tohypoglycaemia symptomology 37.   2. Benazepril (ACEInhibitors) Mode of Action Benazepril is essentially an angiotensinconverting enzyme (ACE) inhibitor medication therapy to treat hypertension38-39. ACE is an enzyme, which produces the development of angiotensin II inthe human body 38.

Angiotensin II triggers contraction of the muscles thatsurrounds and narrows the arteries, which causes hypertension 40. Thus, benazepril is a ACE inhibitor medication that supports to lower blood pressureby stopping the formation of angiotensin II, which essentially relaxes thearteries that’s consequential to lowering blood pressure and also progresses pumpingproductivity of a failing heart, which is an additional advantage for patientswith heart failure conditions 40.       Side Effects There are several side effects that maymanifest with benazepril: dizziness, light headed, tiredness, sweating, fever, headaches, loss of appetite, shortness of breath, rash, chest pains, nausea, joint or muscle pain 40-41. In rare occasions, jaundice and liver dysfunctionhave been reported from ACE inhibitor medication 40. Thus, Benazeprilshouldn’t be taken if patients have these known side effects and allergies withACE inhibitors and seek medical attention if these common side effects stillcontinue 40.  Monitoring Its important to monitor patients renalfunction who are being treated with benazepril, as changes in renal functioningcan include acute renal failure, which can predominantly be caused by drugsthat prevent renin-angiotensin system 41.

Regular blood pressure assessmentsshould be taken with patients to ensure benazepril is working effectively 42. Cautions Patients renal function that depends on theaction of the renin-angiotensin system such as: patients who suffer from kidneydisease, heart failure, artery stenosis, volume depletion can be at potentialrisk of emerging acute renal failure when on benazepril 42.  Thus, health care professionals may eitherwithhold or stop benazepril therapy to those patients who develop significantdecrease in renal functioning 42. Doctors should investigate if femalepatients who are pregnant or planning to get pregnant before prescribingbenazepril, as it is a pregnancy category D medication, which could havepotential health risks to the unborn baby 43.  Counselling Points Counsel patients to avoid taking potassiumsupplementation or salt alternatives with potassium is important, as potassiumin the blood could incline to hazardous levels, which could affect the patient’shealth 43. Its vital to inform patients to report any indications ofinfections (e.

g. fever, sore throat etc.) straightaway, as it could be signs ofneutropenia 44.