Technician Training Tutorial:
Hypertension 101

Up to one in three adults have hypertension, which is simply high blood pressure. With high blood pressure, the pressure inside some blood vessels (arteries) is higher than it should be. The heart has to work extra hard to pump blood through them. Plus, the high pressure is hard on the blood vessels themselves. High blood pressure can lead to a number of serious problems: stroke, heart attack, kidney damage, and blindness to name a few. High blood pressure is sometimes called a “silent killer” because it doesn’t usually have symptoms such as pain that let patients know it’s there. Patients can forget to take their meds, or stop taking them on purpose, which can lead to problems over time. Plus, there are many different meds to treat high blood pressure, including extended-release forms and combination products, that can lead to mix-ups in the pharmacy. This Technician Training Tutorial focuses on how you can pitch in to make sure patients with high blood pressure get the best treatment.

Maury VanMeter, a 62-year-old male patient, brings in an Rx for Hyzaar 100/25, one tablet by mouth once daily. Mr. VanMeter also gets his diabetes meds, metformin and glimepiride, and cholesterol med, atorvastatin, at your pharmacy. He tells you he just finished up seeing his doctor, and that he is doing great with everything. All of his medications will be the same with the exception of this new one, which will allow him to take just one pill instead of two. He hands you new scripts for the meds that will stay the same, and you put them on file.

What causes high blood pressure?
High blood pressure can be caused by a number of different things. For most people, there’s no identifiable cause. Blood pressure just goes up gradually as people age. Older people are more likely to have high blood pressure than younger people, blacks are more likely to have high blood pressure than whites, and overweight people are more likely to have high blood pressure than people who weigh less. Medical conditions that can cause high blood pressure include high cholesterol, diabetes, and kidney problems. The use of some OTC meds such as cold remedies, Rx meds such as birth control pills, illegal drugs such as cocaine, and either smoking or chewing tobacco can cause high blood pressure.

What blood pressure is considered “high”?
Most adults want their blood pressure under 140/90. However, older people or those with diabetes, kidney failure, or heart failure might have slightly different targets.

The top number of a blood pressure is systolic pressure, which is the pressure in the blood vessels when the heart contracts. The bottom number is diastolic pressure, which is the pressure in the blood vessels when the heart is relaxed between beats.
What is the goal of treating high blood pressure, and why is it important?
The goal of treating high blood pressure is to reduce the blood pressure below the desired target, usually 140/90. Getting blood pressure below the target is important to help reduce the patient’s risk of heart attack, stroke, and damage to organs such as kidneys and eyes.

Mr. VanMeter goes on to tell you he is glad to finally be doing well on all of his meds. Over the past year, he had several changes, which were confusing to keep up with. Now, he really feels like he’s on the right track. This is good since he has worried about how diabetes, high cholesterol, and high blood pressure could affect his health. He has a new grandbaby on the way, which is motivating him to keep as healthy as possible.

What are the different kinds of meds used to treat high blood pressure?
There are several different kinds of meds used to treat high blood pressure. In fact, there might be more kinds of meds for treating high blood pressure than there are for treating any other condition. Often a med will be chosen for treating a patient’s high blood pressure if it’s also good for another problem the patient has, such as heart failure or kidney problems.

Diuretics, or “water pills,” such as chlorthalidone, furosemide (Lasix), and hydrochlorothiazide are one of the most common types of meds used to treat high blood pressure. These help reduce the amount of fluid in a patient’s blood vessels.

ACE inhibitors such as enalapril (Vasotec) and lisinopril (Prinivil) and angiotensin receptor blockers or “ARBs” such as losartan (Cozaar) and valsartan (Diovan) are also used very commonly to treat high blood pressure. These also work on the kidneys to help lower blood pressure. They are particularly good for patients with diabetes or kidney problems.

Beta-blockers such as carvedilol (Coreg) and metoprolol (Lopressor [U.S.], Lopresor [Canada]) are good for treating hypertension in patients with heart failure or after a heart attack. They can help dilate blood vessels and also slow down the heart rate.

Calcium channel blockers or “CCBs” such as amlodipine (Norvasc) and nifedipine (Procardia) are good for treating high blood pressure in patients where there isn’t an underlying cause. Calcium channel blockers are similar to beta-blockers, since they act on blood vessels and the heart.

Hydralazine and clonidine are also used for treating high blood pressure. Hydralazine is considered a direct-acting blood pressure med, since it works on smooth muscles in blood vessels. Clonidine is an “alpha agonist” that works on the central nervous system to relax blood vessels. Clonidine can be convenient because it comes as a patch (U.S. only; Catapres) that’s applied once a week.

How can I help prevent mix-ups with blood pressure meds in the pharmacy?
There are several reasons blood pressure meds are prone to mix-ups. Here are some things to watch for to prevent errors with blood pressure meds.

Dosing. The dose of a blood pressure med might be increased or lowered, depending on how the patient responds to the drug and also if other blood pressure meds are started or stopped. When a patient brings in a new Rx for a med he or she has been taking, double check to see if the dose has changed. For example, a patient might bring in a new prescription for furosemide 40 mg once daily when he or she was taking furosemide 20 mg once daily before.
Dispensing a dose of a blood pressure med that’s too low can keep the patient from being able to control his or her blood pressure. But dispensing a dose that’s too high can cause the patient’s blood pressure to drop too low, which can also be dangerous.

Extended-release products. Many blood pressure meds have both immediate-release and extended-release forms. Some examples are carvedilol (Coreg and Coreg CR [U.S.]), and nifedipine (Procardia and Procardia XL [U.S.]). Immediate-release metoprolol (metoprolol tartrate; Lopressor [U.S.], Lopresor [Canada]) and extended-release metoprolol (succinate salt; Toprol-XL [U.S.], tartrate salt; Lopresor SR [Canada]) are particularly easy to mix up. Most extended-release products will be taken once a day, although some will be given twice a day. Ask the pharmacist if you need clarification as to which product should be chosen.

Some blood pressure meds have more than one extended-release form, such as diltiazem (Cardizem CD, Cardizem LA [U.S.], Cartia XT [U.S.], Dilacor XR [U.S.], etc), nifedipine (Adalat CC [U.S.], Afeditab CR [U.S.], Procardia XL [U.S.]), and verapamil (Verelan, Verelan PM [U.S.], Covera-HS [U.S.]). These extended-release products can NOT always be substituted for one another. If you are not sure, check with your pharmacist.

Combination products. Many patients who are treated for high blood pressure end up taking more than one medication to help lower blood pressure. For example, it is common for patients to take a diuretic plus a med that lowers blood pressure in a different way, such as an ACE inhibitor. Because of this, most drugs for high blood pressure come as combo products, to improve convenience for patients.

There are many, many examples of blood pressure med combos, such as lisinopril combined with hydrochlorothiazide (Zestoretic) and losartan combined with hydrochlorothiazide (Hyzaar). Plus, blood pressure meds are being combined with other meds, such as cholesterol-lowering drugs. An example is Caduet, which is amlodipine plus atorvastatin.

If patients are taking combo products, make sure they are not also inadvertently taking the individual ingredients separately. Duplicate therapy alerts on the computer can help with this. For example, if a patient comes in with an Rx for Lotrel (amlodipine plus benazepril [U.S.]), make sure the patient is not supposed to be taking the individual components and cancel out any refills for amlodipine (Norvasc) or benazepril (Lotensin).

Look-alike, sound-alike names. Since there are so many meds for treating high blood pressure, there are lots of look-alike sound-alike names. Consider amlodipine, amiloride, and atenolol; carvedilol and captopril; hydrochlorothiazide and chlorothalidone; nicardipine (U.S.) and nifedipine.

Double check that you’re choosing the correct med in the computer and from the pharmacy shelf when filling these prescriptions. Use the usual strategies to prevent mix-ups with these meds such as shelf tags. Also make sure you choose the correct dose. Most blood pressure meds, whether single ingredient products or combos, come in several different strengths.

Dangerous abbreviations. Many blood pressure meds are dosed once daily with means you are likely to see the abbreviation “QD.” This can be mistaken for “QOD” which means every other day, or for “QID” which means four times a day. Mix-ups because of the abbreviations could lead to either overdosing or underdosing of blood pressure meds. Both can be dangerous. Check with the pharmacist any time you need clarification.

Also watch for abbreviations for drug names, such as “HCTZ” for hydrochlorothiazide. This one can be mistaken for hydrocortisone. Plus “HCT” might mean either hydrocortisone or hydrochlorothiazide.
Multiple providers. If a patient goes to more than one prescriber, a primary care provider and a cardiologist for example, wires can get crossed and there can be misunderstandings about the meds a patient is taking. Let the pharmacist know if you see prescriptions for a patient from more than one provider. This helps the pharmacist know to double check for problems such as duplicate therapies.

When you enter Mr. VanMeter’s new Rx into the computer, you get a duplicate therapy alert. You see that he has one refill left on his hydrochlorothiazide prescription, so you zero it out. He was also taking losartan, but he doesn’t have any refills left on that one. You double check the dose of Hyzaar as you enter it into the computer, since it comes in different strengths. You also make sure you choose the combo product instead of either of the ingredients separately.

In what other ways can I help patients treat their high blood pressure?

Be sure to apply appropriate auxiliary labels to blood pressure meds. For example, put a “take in the morning” label on diuretics such as furosemide and hydrochlorothiazide to help patients reduce nighttime trips to the bathroom. Apply a “may cause dizziness or drowsiness” label to beta-blockers and clonidine. Patients may want to take these in the evening. Also let patients know to keep certain meds such as aliskiren (Tekturna [U.S.]; Rasilez [Canada]) and azilsartan (Edarbi, etc) in the container or packaging they’re dispensed in. Storing these drugs in their original containers keeps them potent by protecting them from light and moisture.

Since patients usually don’t have symptoms from high blood pressure, it can be easy for them to skip their blood pressure meds either by accident or on purpose. Watch for patients who are not getting their refills on time, which could be a red flag for lack of adherence. Alert the pharmacist about these patients. They may benefit from counseling, with info about the importance of sticking with their blood pressure med regimens, side effects, or affording meds. Taking blood pressure meds correctly and not stopping them is good for pharmacists to emphasize. Stopping some meds such as beta-blockers abruptly can cause blood pressure to skyrocket. This is dangerous, since very high blood pressure can lead to problems such as strokes. Some side effects, such as frequent urination with diuretics, will go away after a few weeks. Other side effects, such as a cough with ACE inhibitors, may require that the med be switched. And of course pharmacists might be able to help patients who have trouble affording their blood pressure meds by working with the prescriber to find lower cost alternatives.

Watch for patients who are buying over-the-counter products and also taking medications for blood pressure. Some of these, such as pseudoephedrine, can cause increased blood pressure. The pharmacist can assist patients who have high blood pressure with choosing OTC products that are safe for them.

How can I help patients with blood pressure cuffs?

Help patients sort through all the options for measuring blood pressure on the pharmacy shelves. Choosing a cuff that fits is important for getting an accurate measurement. As a rule, the inflatable part of the blood pressure cuff should encircle at least 80% of the patient’s upper arm circumference. If a cuff doesn’t fit correctly, the blood pressure measurement can be inaccurate. It can read too high if the cuff is too small or too low if the cuff is too big.

In most cases, monitors that go around the upper arm are more accurate than wrist or fingertip monitors. However, a wrist monitor might be a good option for a patient with a large arm that does not fit well in arm cuffs. To help accommodate different patients, consider stocking large, extra-large, and small cuffs in addition to regular size cuffs in your pharmacy.

Encourage patients who have their blood pressure measured in the pharmacy to talk to the pharmacist about their blood pressure numbers. The pharmacist can make suggestions about lifestyle changes such as
smoking cessation that can help lower blood pressure, answer any questions the patient might have about meds, and also review the patient’s medication profile to identify ways to better control blood pressure.

The pharmacist checks Mr. VanMeter’s prescription, and then talks briefly to Mr. VanMeter about how this new med will replace two that he had before. As you are checking Mr. VanMeter out, he asks about blood pressure cuffs for home monitoring. You explain how to select the right size, and let him know that the monitors placed on the arm are generally the best. You also give him a copy of the PL Patient Education Handout, How to Check Your Blood Pressure, to help him do a good job measuring his blood pressure at home.

**What is “hypertensive emergency”?**
In the hospital setting, you might see patients with hypertensive emergency. This means the blood pressure is so high that the patient is at immediate risk of damage to organs such as the heart, kidneys, lungs, and brain.

IV meds will be used for patients with hypertensive emergency since they work fast to lower blood pressure. IV meds that you might see ordered for these patients include clevidipine (*Cleviprex [U.S.]*), esmolol (*Brevibloc*), fenoldopam (*Corlopam [U.S.]*), labetalol, nicardipine (*Cardene [U.S.]*), nitroglycerin, and nitroprusside. Prepare new orders for IV antihypertensive drugs right away and make sure they’re delivered to the appropriate place in a timely fashion.

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