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## Learning Objectives

- Articulate role of pharmacist in performing physical assessment
- Differentiate between physical assessment techniques (inspection, palpation, percussion, auscultation)
- Relate physical assessment techniques to the overall process for a history and physical exam
- State normal values for adult vital signs
- Describe the steps for obtaining temperature, blood pressure, heart rate, and respiratory rate
  - Lab—demonstrate technique to measure BP

## Definition of Physical Assessment

- A tool to gather *readily available* information needed to make an informed decision about a patient's health-related problems.
- Gathering objective and subjective information and using it to evaluate a patient's physical condition *appropriately and quickly*.
  1. Observation and Interview
  2. Inspection
  3. Palpation
  4. Percussion
  5. Auscultation

## Why do *we* need to know this?

- Physical assessment skills are essential to determine if patients are experiencing beneficial or harmful medication effects.
- Growing opportunities:
  - MTM programs
  - Retail pharmacy-based clinics
  - Collaborative practice in ambulatory care

Besides, it's just good patient care...



## How many times do you hear this?

- I've got this rash...
- Am I supposed to feel this way?
- Should I see a doctor about this?
- Is it worth waiting at urgent care or ER for this?
- Could this be from the medication I take?
- What can I take for this?
- What's the best drug to take?
- I've got this pain...
- I feel dizzy, I feel nauseas, I feel awful, etc. etc.

## Homework for Lab

- Read *Physician and pharmacist collaboration to improve blood pressure control*. Carter et al. Arch Intern Med. 2009;169(21):1996-2002.
- Summarize the study in writing (using the technique you learned in Pharm 500)
- Answer the following:
  - What are the drawbacks of this study?
  - What real life application does this study have?

## Case Study 1

WL is an 83-yo WM who had AMI 20 years ago. He is currently being treated for CHF and HTN, which is controlled with digoxin and lisinopril. Progressive renal insufficiency resulted in renal failure 4 years ago. The patient, a vigorous and independent man who seldom complains, has come to the pharmacy with a chief complaint of dizziness. When questioned, the patient reports that during a one-block walk to his daughter's house, he suffered loss of balance that made him walk to the left off the sidewalk into a fence.

Physical Assessment in the Community Pharmacy. Pauley, Marcrom, Randolph. Amer Pharm. 1995:NS35(5):40-49.

## Obtaining HPI (History of Present Illness)

- PQRST ("key symptom questions")
  - **P**recipitating factors: "Why do you think this started?" or "What makes it better or worse?"
  - **Q**uality: "Describe the pain."
  - **R**egion: "Where does it hurt?"
  - **S**everity: "How bad is it...on scale of 1-10?"
  - **S**ymptoms: "What other symptoms do you have?"
  - **T**iming: "When did it start? Does it come and go? What time of day does it bother you?"
  - **T**reatments: "What medications have you tried?"

## Obtaining HPI (History of Present Illness)

- OLD CARTS ("key symptom questions")
  - **O**nset: "When did this start?"
  - **L**ocation: "Where does it hurt?"
  - **D**uration: "How long does the pain last?"
  - **C**haracteristics: "Is the pain burning, tearing, achy?"
  - **A**ggravating factors: "What makes it better?"
  - **R**elieving factors: "What makes it worse?"
  - **T**reatments: "What have taken to treat this?"
  - **S**everity: "On a scale of 1 to 10, how bad is the pain?"

## Case Study 1

**HPI:** "Further inquiry" revealed he felt more fatigued lately and had not slept well the night before. When asked why, he stated that he had difficulty breathing but felt much better by morning. He stated he got dialysis the day before and had a check up with the nurse there.

Physical Assessment in the Community Pharmacy. Pauley, Marcrom, Randolph. Amer Pharm. 1995:NS35(5):40-49.

## Performing Physical Exam (ROS and PE)

- Review of Symptoms
  - Observation and Interview
  - Head to toe verbal review of all relevant symptoms
  - Gather subjective information from patient
- Physical Exam
  - Inspection, palpation, percussion, auscultation
  - Physical assessment of all relevant body systems
  - Gather objective information yourself

## Case Study 1

**PE:** "Upon physical exam" ears, pharynx, and body temp were WNL. "Further inspection" of eyes and nose revealed nothing remarkable. But auscultation revealed diminished air movement in lower lung bilat. Persistent localized wheezing was faintly audible, and percussion produced dull sounds in the lower lobes.

Physical Assessment in the Community Pharmacy. Pauley, Marcrom, Randolph. Amer Pharm. 1995:NS35(5):40-49.

## Case Study 1

**Assessment:** Possible lung infection or fluid accumulation related to worsened CHF. Could indicate complication of renal failure. Further evaluation needed.

**Plan:** Pharmacist referred for further examination. Called daughter and prescriber.

**Outcome:** Chest X-ray showed pneumonia in both lower lobes and prescriber ordered Ciprofloxacin x 10d and reevaluation x 1 week. Patient improved, hospitalization avoided.

## Recognize and Seize the Moment

- Always investigate further.
- Ask yourself...could this be drug related?
- Ask yourself...could this be related to the patient's medical condition?
- Is there a way I can help right now?
- Does this patient need referral for evaluation or care?

## Obtaining Patient Vitals

(All reported values are for adult patients)



## Vital Signs

- Temperature (T)
- Blood pressure (BP)
- Pulse (P, HR, RRR)
- Respiratory rate (R)
- Pain scale ("5<sup>th</sup> vital sign")

## Temperature

- Normal range depends on route
  - Rectal > Temporal artery > Ear > Oral > Axillary
- Where's the best place to take a temperature?
  - <3 months old: rectally
  - 3 months – 5 yrs old: rectal, temporal, ear
  - >5 yrs old: oral, ear, temporal artery
- Fever:
  - Oral temp of >37.9°C (100.9°F)



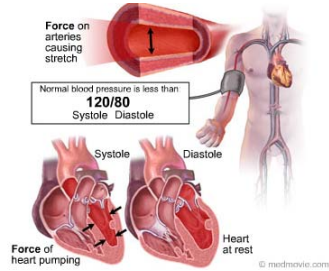
## Temperature (cont.)

- Oral temperature tips
  - Glass thermometers
    - Shake until meniscus <35°C
    - Keep in place for 3 minutes
  - Avoid hot or cold drinks for at least 30 minutes
  - Ensure good seal around thermometer
- Ear temperature affected by ambient air
- Accuracy of temperature strips questionable
  - Some brands found to report erroneous afebrile readings in up to 72% of febrile children

Am J Dis Child 1982 Mar;136(3):198-201

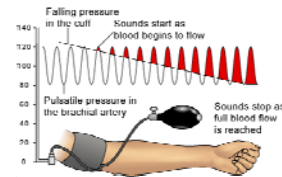
## Blood Pressure

- Measures force of blood against artery walls

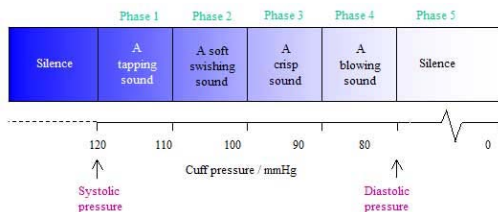


## Blood Pressure: Measurement

- Under external pressure, circulating blood hits the arterial wall which results in turbulence (Korotkoff's sounds)
- Systolic BP: start of Korotkoff's sounds
- Diastolic BP: point at which sounds disappear



## Blood Pressure: Measurement



## How to Measure Blood Pressure

- Have patient sit quietly for 5 minutes
- Ask about factors that acutely affect BP
- Palpate brachial artery (located on the upper inner arm under the bicep)
- Center cuff at brachial artery and wrap snugly around arm ~1 inch above antecubital fossa (inside of elbow)
- Palpate radial pulse and inflate cuff until radial pulse is no longer felt (= palpated SBP)
- Deflate cuff and wait (ideally) 5 minutes before re-inflating

## How to Measure Blood Pressure

- Place diaphragm or bell of stethoscope above antecubital fossa over brachial artery
- Re-inflate cuff 30 mm Hg above palpated SBP
- Release air from cuff at a rate of 2-3 mm Hg per minute
- Record when Korotkoff sounds first appear (SBP) and when they disappear (DBP)

## Blood Pressure (cont.)

### Things to remember:

- Patient seated quietly for at least 5 minutes
- Use chair & table for proper arm placement
  - Cuff at heart level
- Both feet flat on floor
- Ask for use of caffeine or smoking (<30min)
- Use proper size cuff
  - Cuff bladder should encircle ≥80% of arm



## Blood Pressure (cont.)

### Pitfalls:

- Putting stethoscope under edge of cuff
- Measuring over clothing
- Stethoscope bell/diaphragm turned wrong way
- Tightening valve too much
- Letting air out too fast
- Relying on visual cues (needle jumping) instead of auditory signs



## Blood Pressure: Need for Accuracy

- “I *think* you’re around one....eighteen over sixty...four??” --typical Pharm 504 student
- Implications of a 10 / 5 mm HG change in SBP:
  - 2002, meta-analysis involving 958, 074 subjects<sup>1</sup>
    - 40% lower risk of stroke death
    - 30% lower risk of death from ischemic heart disease

<sup>1</sup> Lancet, 2002 Dec 14;360(9349):1903-13.

## Screening vs. Diagnosis

- Elevated BP results in screening do not constitute diagnosis.
- Proper hypertension diagnosis:
  - Multiple high BP readings on different days
  - Multiple other physical exam procedures to check cardiac function & HTN complications
- Since we do not do full exam nor multiple readings, abnormal results in screening simply identify need for further evaluation.

## JNC 7 Guidelines

Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure, 7<sup>th</sup> Report

Table 1. Classification and management of blood pressure for adults\*

BP Classification	SBP <sup>a</sup> mmHg	DBP <sup>a</sup> mmHg	Lifestyle Modification	Initial Drug Therapy	
				Without Compelling Indication	With Compelling Indications (See Table 6)
Normal	<120	and <80	Encourage		
Prehypertension	120-139	or 80-89	Yes	No antihypertensive drug indicated.	Drug(s) for compelling indications. <sup>†</sup>
Stage 1 Hypertension	140-159	or 90-99	Yes	Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.	Drug(s) for the compelling indications. <sup>†</sup> (Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.)
Stage 2 Hypertension	≥160	or ≥100	Yes	Two-drug combination for most (usually thiazide-type diuretic and ACEI or ARB or BB or CCB).	Two-drug combination for most (usually thiazide-type diuretic and ACEI or ARB or BB or CCB).

DBP, diastolic blood pressure; SBP, systolic blood pressure.

Drug abbreviations: ACEI, angiotensin converting enzyme inhibitor; ARB, angiotensin receptor blocker; BB, beta-blocker; CCB, calcium channel blocker.

\* Treatment determined by highest BP category.

† Initial combined therapy should be used cautiously in those at risk for orthostatic hypotension.

‡ Treat patients with chronic kidney disease or diabetes to BP goal of <130/80 mmHg.

<http://www.nhlbi.nih.gov/guidelines/hypertension/>

## Compelling Indications

- Heart failure
- Prior myocardial infarction (MI)
- High CHD risk
- Diabetes
- Chronic kidney disease
- Prior stroke

## Recommended Management of Hypertension

Blood Pressure Classification	Lifestyle Modification	Initial Drug Therapy	
		Without compelling indication	With compelling indication
Normal	Encourage		
Prehypertension	Yes	No antihypertensive drug indicated	Drug(s) for the compelling indications
Stage 1 hypertension	Yes	Thiazide-type diuretics for most; may consider ACE inhibitor, ARB, beta-blocker, CCB, or combination	Drug(s) for the compelling indications; other antihypertensive drugs (diuretics, ACE inhibitor, ARB, beta-blocker, CCB) as needed
Stage 2 hypertension	Yes	2-drug combination for most (usually thiazide-type diuretic and ACE inhibitor or ARB or beta-blocker or CCB)	Drug(s) for the compelling indications; other antihypertensive drugs (diuretics, ACE inhibitor, ARB, beta-blocker, CCB) as needed

© 2003 Medscape, Medscape Cardiology 7(1), 2003. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and the Treatment of High Blood Pressure -- the NHLBI JNC 7 Press Conference

## Patient Counseling

- Benefits of lowering BP with drug therapy
  - Reduce stroke incidence by 35-40%
  - Reduce MI incidence by 20-25%
  - Reduce heart failure incidence by > 50%
- Prevent end organ damage
  - Heart (MI, angina, CHF), stroke (TIA), kidney failure, retinopathy, aortic aneurism (AAA)
- Patients with Stage 1 HTN + CVD risk factors, lowering SBP by 12mmHg over 10 years will prevent 1 death for every 11 patients treated

Lancet. 2002 Dec 14;360(9349):1903-13.

## Patient Counseling

- Lifestyle modifications:
  - Weight loss (if overweight)
  - Regular exercise
  - Sodium restriction (<2000mg/day or 2 tsp)
  - Dietary Approaches to Stop HTN (DASH diet)
  - Stop smoking
  - Reduced saturated fat intake
  - Moderate alcohol consumption

Table 5. Lifestyle modifications to manage hypertension<sup>a,b</sup>

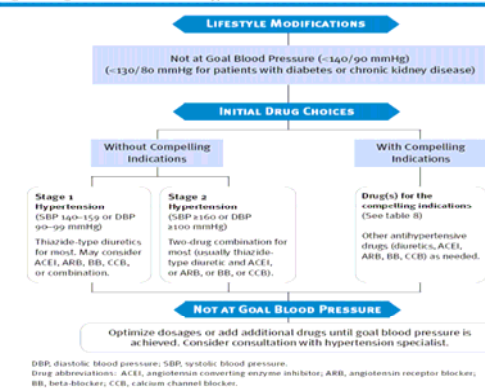
Modification	Recommendation	Approximate SBP Reduction (Range)
Weight reduction	Maintain normal body weight (body mass index 18.5–24.9 kg/m <sup>2</sup> ).	5–20 mmHg/10 kg weight loss <sup>c,d</sup>
Adopt DASH eating plan	Consume a diet rich in fruits, vegetables, and lowfat dairy products with a reduced content of saturated and total fat.	8–14 mmHg <sup>e,f</sup>
Dietary sodium reduction	Reduce dietary sodium intake to no more than 100 mmol per day (2.4 g sodium or 6 g sodium chloride).	2–8 mmHg <sup>g,h</sup>
Physical activity	Engage in regular aerobic physical activity such as brisk walking (at least 30 min per day, most days of the week).	4–9 mmHg <sup>i,j</sup>
Moderation of alcohol consumption	Limit consumption to no more than 2 drinks (1 oz or 30 ml ethanol, 0.6–24 oz beer, 10 oz wine, or 3 oz 80-proof whiskey) per day in most men and to no more than 1 drink per day in women and lighter weight persons.	2–4 mmHg <sup>k</sup>

DASH, Dietary Approaches to Stop Hypertension.

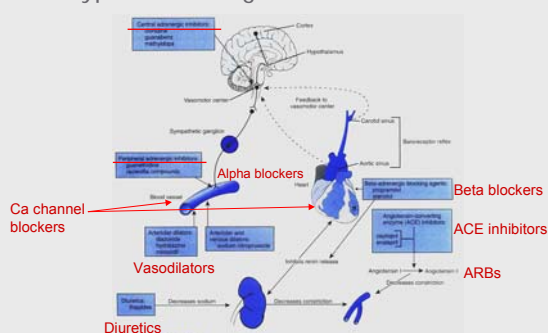
<sup>a</sup> For overall cardiovascular risk reduction, stop smoking.

<sup>b</sup> The effects of implementing these modifications are dose and time dependent, and could be greater for some individuals.

Figure 1. Algorithm for treatment of hypertension



## Antihypertensive Agents: Site of Action



## Patient Follow-up

- Monthly BP checks until reach goal
- More frequent visits if stage 2 HTN
- Serum K and SCr should be measured 1-2 times a year
- Encourage/pursue smoking cessation
- Once at goal, BP checks every 3-4 months
- Low dose ASA only after BP in control

## Home BP Monitoring

- Recommended for most patients by several recent national guidelines
- Better predictor of cardiovascular outcomes and end organ damage than office measurement
- Measurements should be standardized
- Device should be validated and calibrated
- Arm devices with memory preferred



Mallick et al. *Am J Med.* 2009;122:803-810.

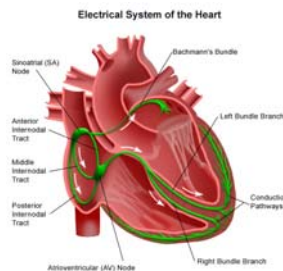
## Pulse

- Palpate radial or carotid pulse for 15 seconds, then multiply by 4
  - Use index or middle finger (thumb has pulse)
  - If heart rhythm is irregular, should measure by auscultation



## Heart Rate & Rhythm

- Rate
  - Normal: 60-100 bpm
  - Bradycardia: <60 bpm
  - Tachycardia: >100 bpm
- Rhythm
  - Regular
  - Regularly irregular
  - Irregularly irregular



## Respiratory Rate

- Measure either by watching the chest cavity rise and fall or through auscultation
- Measure for 15 seconds, then multiply by 4
- One respiration defined as one inhalation and one exhalation
  - Normal: 12-20 breaths/min
  - Bradypnea: <12 breaths/min
  - Tachypnea: >20 breaths/min

## Respiratory Rate (cont.)

- Tips:
  - Do not allow patient to know when you are measuring
  - Listen for wheezing or crackles
  - Watch for use of accessory muscles or pursed lips



## Summary

- Pharmacists have a role in physical assessment
  - Evaluating drug therapy
  - Detecting problems for treatment
  - Referral for further evaluation
- Appropriate physical assessment (history and physical exam) has a specific format, order, and rationale.
- Vitals signs include temperature, blood pressure, pulse, respiratory rate (and pain).
- Blood pressure measures force in blood circulation at rest (DBP) and contraction (SBP).
- Following correct procedure for BP measurement (and other vitals signs) will improve accuracy of results.