

# Pharmaceutical Care Practice

## Adapted from Module D of the Preceptor Development Program

Developed through a collaboration between  
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# 3. Pharmacotherapy Workup

- What is it?
  - The Pharmacotherapy Work-up is a systematic approach to identify problems related to a patient's drug therapy .
- What does it ensure?
  - That all of a patient's medications are indicated, effective, safe and that the patient can be compliant.

Adapted from "Patient Care Process Module Part II: Pharmacotherapy Workup" by Sharon Yamashita. Leslie Dan Faculty of Pharmacy.



# 3. Pharmacotherapy Workup

- The practitioner considers drug related needs
  - Does the patient have an indication for each of his/her drug therapies and is each medical condition being treated with drug therapy?
  - Are these drug therapies effective for the patient's medical condition or indication? (compare response to desired goals)
  - Are these drug therapies as safe as possible? (evaluate drug therapy for adverse drug reaction or drug toxicity)
  - Is the patient able to be adherent to his or her drug therapies as instructed?

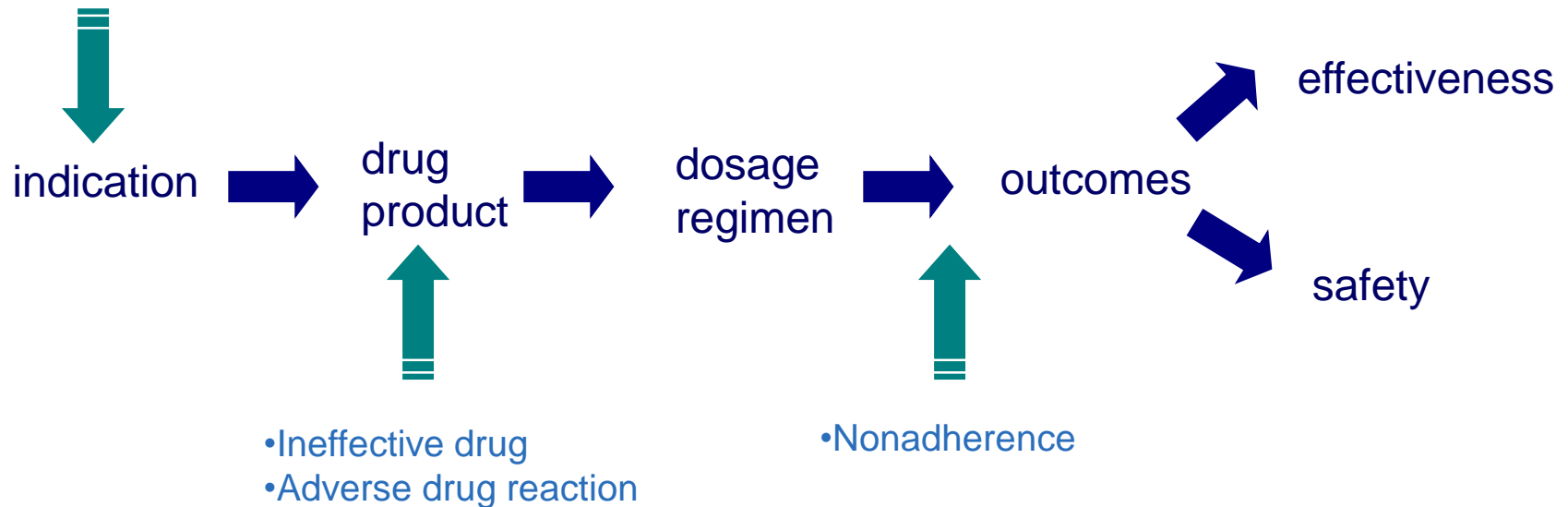
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# 3. Pharmacotherapy Work-up

- Unnecessary drug therapy
- Needs additional drug therapy

- Dose too low
- Dose too high



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# 3. Pharmacotherapy Workup

## Are the current signs and symptoms/problem being caused by a drug?

- What drugs cause this problem?
  - How do these drugs cause this problem?
  - What is the time frame in which these drugs cause this problem?
- What drugs is the patient taking?
  - Is the patient taking any of these drugs that are known to cause these signs and symptoms?
  - Is the time frame consistent?

Adapted from “Patient Care Process Module Part II: Pharmacotherapy Workup” by Sharon Yamashita. Leslie Dan Faculty of Pharmacy.



# 3. Pharmacotherapy Workup

## Organization of current medication record

Indication/ Medical Condition	Drug Regimen	Start Date	Outcomes (Efficacy/Safety)
Hypertension (high blood pressure)	Hydrochlorothiazide 12.5 mg po once daily		
	Ramipril 5 mg po once daily		
	Amlodipine 5 mg po once daily		
Insomnia			
?? GERD vs GI protection (F/U with patient)	omeprazole		



# 3. Pharmacotherapy Workup

## Can the current signs and symptoms/problem be treated with drug therapy?

- Are the patient's signs and symptoms consistent with a specific disease state?
- Why does this disease state require therapy?

Adapted from "Patient Care Process Module Part II: Pharmacotherapy Workup" by Sharon Yamashita. Leslie Dan Faculty of Pharmacy.



# 3. Pharmacotherapy Workup

## Can the current signs and symptoms/problem be treated with drug therapy?

- What drugs can be used to treat this problem? Compare options considering efficacy, onset, safety, interactions, convenience and cost.

Drug/ Class	Mechanism of Action	MOA in disease	Onset of Action in disease	Efficacy / Role in therapy	Clinically relevant adverse effects	Clinically relevant drug interactions	Cost	Convenience
Ramipril (ACEI) for heart failure	Inhibits conversion of AGI to AGII	Antagonizes adverse effects of AG on myocardial tissue (eg remodelling); also decreases afterload and preload. Likely a class effect.	Months	Studies show reduction in mortality in NYHA grade 1-4. May also reduce symptoms. 1 <sup>st</sup> line therapy in all patients with HF (also consider in prevention of HF in high risk patients).	Angioedema, cough, hyperkalemia, hypotension, renal failure	Pharmaco-dynamic interactions with other drugs which decrease BP or cause hyperkalemia.	Cheap to moderate cost with many generics available.	Many require daily administration. Periodic monitoring of Scr and K required.

Adapted from "Patient Care Process Module Part II: Pharmacotherapy Workup" by Sharon Yamashita. Leslie Dan Faculty of Pharmacy.





# 3. Pharmacotherapy Workup

## Can the current signs and symptoms/problem be treated with drug therapy?

- Is the patient receiving any of these effective therapies?
  - If not, then drug therapy is indicated
  - If yes, why is therapy not working? (Think about whether the goals of therapy for this disease state have been met?)
    - Is the patient receiving the most appropriate dosage regimen/product/dose?
    - Is the dose too low?
    - Does the patient require additional drug therapy?
    - Is the patient compliant with the regimen?

Adapted from “Patient Care Process Module Part II: Pharmacotherapy Workup” by Sharon Yamashita. Leslie Dan Faculty of Pharmacy.



# 3. Pharmacotherapy Workup

- Over time, experienced practitioners use a simplified approach
  - Is the problem caused by drug therapy?
  - Could the problem be treated with drug therapy?
    - Is drug therapy **indicated**?
    - Is the current therapy **effective**?
    - Is the drug **safe** to use?
    - Is the patient able to be **adherent**?

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# Drug Therapy Problems

- A drug therapy problem (DTP) is any **undesirable** event experienced by a patient which involves, or is suspected to involve, drug therapy, and that interferes with achieving the desired goal of therapy.

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# Components of a DTP

1. **Undesirable event or risk of an event** experienced by the patient
2. The **drug therapy involved**
3. The **relationship** that exists (or is suspected to exist) between the undesirable patient event and the drug therapy

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# DTP Categories

Drug-Related Needs	Categories of drug therapy problems
Indication (I)	Unnecessary drug therapy
	Needs additional drug therapy
Effectiveness (E)	Ineffective drug
	Dosage too low
Safety (S)	Adverse drug reaction
	Dosage too high
Adherence (A)	Nonadherence

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# Unnecessary Drug Therapy

Category	Indication
Description	Drug therapy is <b>UNNECESSARY</b> because the patient does not have an indication at this time.
Common causes	<ul style="list-style-type: none"><li>• No valid medical indication for the drug at this time.</li><li>• Multiple drugs are being used for a condition that requires single drug therapy.</li><li>• Medical condition is more appropriately treated with non-drug therapy.</li><li>• Drug is being taken to treat an avoidable adverse drug reaction associated with another medication.</li><li>• Drug abuse, alcohol abuse, smoking is causing the problem.</li></ul>
Example	The patient is taking ibuprofen and naproxen for pain control and pain has been controlled with one NSAID, putting patient at risk for drug toxicity.

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# Needs Additional Drug Therapy

Category	Indication
Description	ADDITIONAL drug therapy is required to treat or prevent a medical condition or illness from developing.
Common causes	<ul style="list-style-type: none"><li>• A medical condition requires the initiation of drug therapy.</li><li>• Preventative drug therapy is required to reduce the risk of developing a new condition.</li><li>• A medical condition requires additional therapy to attain synergistic or additive effects.</li></ul>
Example	The patient is at high risk to contract pneumonia and therefore requires a pneumococcal vaccine.

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# Ineffective Drug

Category	Effectiveness
Description	The drug product is not <b>EFFECTIVE</b> at producing the desired response in the patient
Common causes	<ul style="list-style-type: none"><li>• The drug is not the <i>most</i> effective for the indication.</li><li>• The medical condition is refractory to the drug.</li><li>• The dosage form of the drug is inappropriate.</li><li>• The drug is not effective for the medical problem.</li></ul>
Example	The patient is at risk of treatment failure since nitrofurantoin's concentration in serum and kidney tissue is inadequate and therefore ineffective to treat pyelonephritis

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# Dosage too Low

Category	Effectiveness
Description	The DOSE IS TOO LOW to produce the desired response
Common causes	<ul style="list-style-type: none"><li>• The dose is too low.</li><li>• The dosage interval is too infrequent.</li><li>• A drug interaction reduces the amount of active drug available.</li><li>• The duration of therapy is too short to produce the desired response.</li></ul>
Example	The patient's 2.5mg daily dose of glyburide is too low to provide adequate control of her blood glucose, and patient is at risk of hyperglycemia.

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# Adverse Drug Reaction

Category	Safety
Description	The drug is causing an ADVERSE REACTION in the patient.
Common causes	<ul style="list-style-type: none"><li>• The drug causes an undesirable reaction that is not dose-related.</li><li>• A safer drug product is required due to risk factors.</li><li>• A drug interaction causes an undesirable reaction that is not dose-related.</li><li>• The dosage regimen was administered too rapidly</li><li>• The drug causes an allergic reaction.</li><li>• The drug is contraindicated due to risk factors.</li></ul>
Example	The patient developed a rash caused by trimethoprim-sulfamethoxazole he was taking to treat a wound infection.

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# Dosage too High

Category	Safety
Description	The DOSE IS TOO HIGH, resulting in undesirable effects.
Common causes	<ul style="list-style-type: none"><li>• The dose is too high.</li><li>• The dosing frequency is too short.</li><li>• The duration of drug therapy is too long.</li><li>• A drug interaction occurs resulting in a toxic reaction to the drug product.</li><li>• The dose of the drug was administered too rapidly.</li></ul>
Example	The patient developed bradycardia and second degree heart block resulting from a 0.5mg daily dose of digoxin used for CHF. This dose was too high for his age and declining renal function.

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# Non-adherence

Category	Adherence
Description	The PATIENT IS NOT ABLE OR WILLING to take the drug therapy as intended.
Common causes	<ul style="list-style-type: none"><li>•The patient does not understand the instruction.</li><li>•The patient prefers not to take the medication.</li><li>•The patient forgets to take the medication.</li><li>•The drug is too expensive for the patient.</li><li>•The patient cannot swallow or self-administer the drug.</li><li>•The drug is not available for the patient.</li></ul>
Example	The patient is experiencing non adherence as she is not able to remember to instill her timolol eye drops twice daily for her glaucoma.

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# Stating Drug Therapy Problems

Statement of DTP should include:

1. **Description of patient's problem**  
(undesirable event or risk of event)
2. **The drug therapy** involved
3. **Association** between drug and condition

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# Stating Drug Therapy Problems

- Usually only 1 DTP per drug
- Select the highest priority problem
  - Indication
  - Effectiveness
  - Safety
  - Adherence

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# Prioritizing DTPs

## Prioritization depends on:

1. The potential for harm as determined by the team/healthcare provider
2. Urgency of the situation
3. Patient's perception of potential harm

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# Patients with NO DTPs

- If a patient has no DTPs, this means that **all of the patient's drug-related needs are being met**
- A care plan and follow-up are still important to ensure goals of treatment are being met and new DTPs do not develop

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# References

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Cipolle, RJ, Strand, LM & Morley, PC. *Pharmaceutical Care Practice – the Clinician's Guide, Second Edition*. New York (USA); McGraw- Hill Companies Inc; 2004.

