

Monitoring & Follow-up

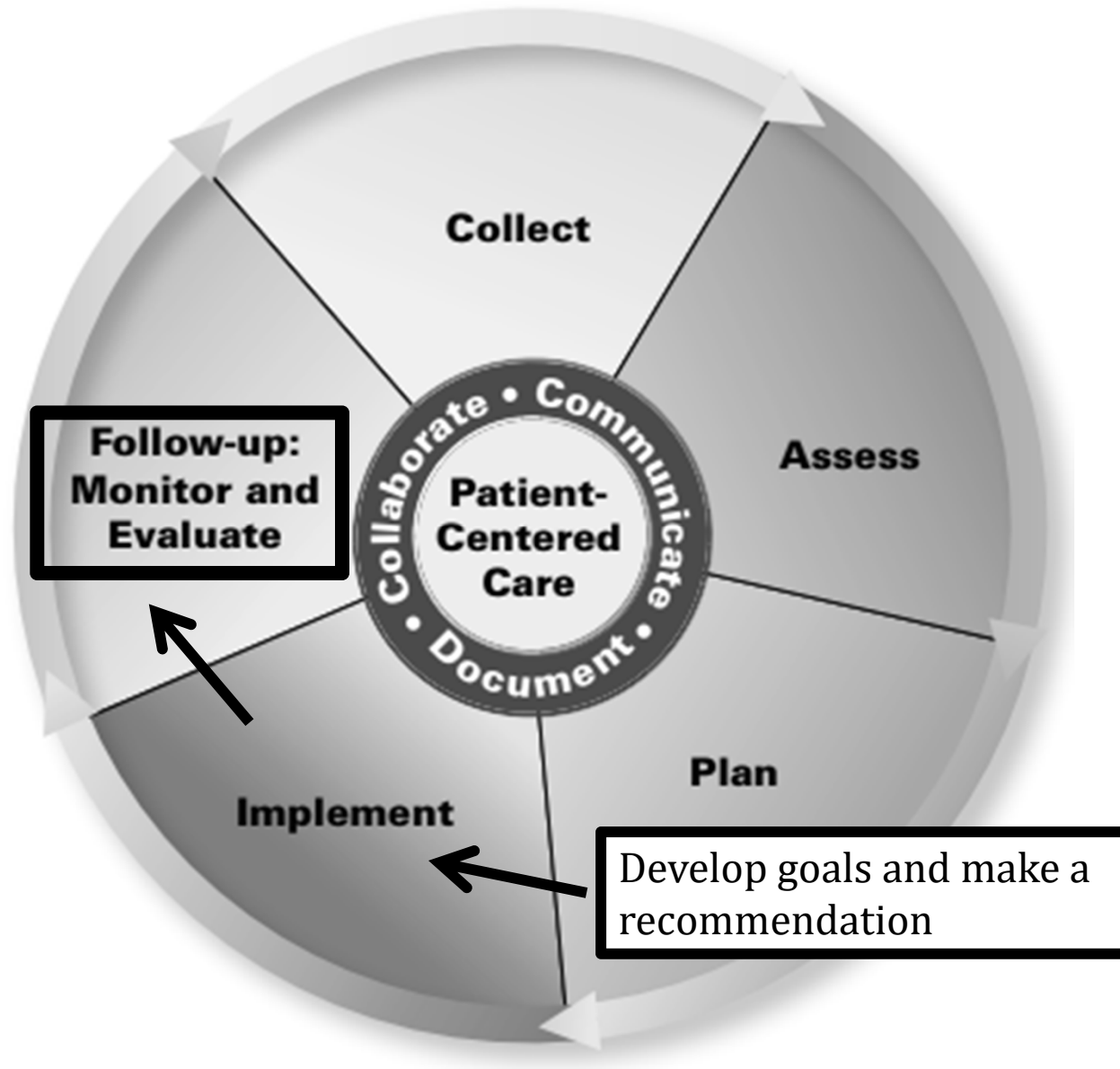
Pharmaceutical care
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Objectives

- Develop appropriate monitoring parameters that can be used to assess:
 - Achievement of therapeutic goals
 - Efficacy of therapeutic recommendations
 - Safety of therapeutic recommendations
- Recommend appropriate follow up for patients, including with whom to follow up with and when

Pharmacists' Patient Care Process



Monitoring and Follow-up

- Monitoring:
 - Assess achievement of therapeutic goals
 - Effectiveness (or efficacy)
 - Assess for any new problems or adverse effects
 - Safety
- Follow up:
 - Who will the patient follow up with and when?
 - When should the patient contact their provider for earlier follow up?

Monitoring for Effectiveness

- Develop monitoring parameters that will help you assess *whether or not the recommended medication or therapy is working*
 - Effectiveness (efficacy) monitoring parameters are generally related to the goals that have been set

Monitoring for Effectiveness

Goals

Monitoring

Cure or prevent disease	→	Evaluate final outcome
Slow progression of disease	→	Evaluate for signs and/or symptoms of condition
Reduce signs and/or symptoms	→	Evaluate for changes in signs and/or symptoms
Normalize lab values	→	Evaluate for changes in lab values

Monitoring for Safety

- Assess the patient for any new problems.
- New problems that develop secondary to the treatment plan
- Adverse effects related to medication therapy
 - Toxicity can manifest as:
 - Signs/symptoms
 - Lab abnormalities

Developing Monitoring Parameters

- Think about these questions:
 - What is the therapy's intended effect?
 - When should you check for this effect?
 - What should the patient expect?
 - When should the patient feel better?
 - When might adverse effects occur?
 - What side effects or toxicities might be expected?
 - When should the patient be evaluated for side effects or toxicity?

examples of common disorders in which effectiveness of pharmacotherapy is evaluated based on changes in clinical signs and symptoms

Therapeutic indication	Clinical Parameter
depression	Mood changes, feelings of sadness, energy level, interest or enjoyment in usual or favorite activities, insomnia, agitation, fatigue, ability to concentrate, thoughts of death
Anxiety	Level of restlessness, irritability, muscle tension, sleep disturbance, ability to concentrate
Cough	Severity and frequency of cough, interruption of daily activities or sleep
Rash	changes in color, size, inflammation, and itching
Osteoarthritis	Changes in pain in weight-bearing joints including hip, knee, spine, and hands. Changes in stiffness in other joints
Back Pain	Changes in level, quality and intensity of pain, weekly episodes of pain, worse pain over the past week, ability to ambulate, sleep, work, and changes in ability to function including activities of daily living at work and in social settings

Laboratory Test Results Used to Evaluate Effectiveness of Pharmacotherapy

Therapeutic indication	Laboratory parameters
Hyperlipidemia	Total cholesterol, LDLs, HDLs, triglycerides
Hypertension	Systolic and diastolic pressure, mean arterial pressure, pulse rate
Anemia	Complete blood cell count, hemoglobin, hematocrit, red blood cell count, mean corpuscular volume, reticulocyte count, serum iron, serum B12
Cardiac dysrhythmias	Electrocardiogram (ECG, EKG)
Diabetes	Blood or plasma glucose, hemoglobin A1c, lipids, blood pressure, renal function tests including serum creatinine and blood urea nitrogen

Developing Monitoring Parameters

- Use the SMaRT format for monitoring too!
 - Specific, measurable (or observable), related and time-bound

SMART goal	SMART monitoring
“Eradicate infection within one week”	
“Maintain ability to walk up stairs at 3 month follow up”	
“Reduce pain to less than 3 on a scale of 1-10 in 1 week”	
“Return potassium level to 3.5-5 mEq/L within 2 hours”	

Avoid These Common Mistakes

When Developing Monitoring Parameters

- Forgetting the SMART format
 - Not being specific
 - Not selecting monitoring endpoints that are measurable or observable
 - Not including a timeframe or choosing an inappropriate timeframe for monitoring (when or how often)
- Mixing up efficacy and safety monitoring
 - Efficacy: what to monitor to know if the recommended therapy is *working or not*
 - Safety: what to monitor to know if the recommended therapy is *causing an adverse effect* or toxicity

Examples of Common Mistakes

When Developing Monitoring Parameters

“Bad” monitoring parameter	What’s wrong with it?
“Pharmacist to ensure correct drug is dispensed to the patient”	This is not monitoring – it is an vital component of a pharmacist's role, so it is assumed that the pharmacist will do this
“Pharmacist should note any unusual changes in patient's health status”	This monitoring parameter is not specific, not measureable/observable as written and has no timeframe – what specific changes should the pharmacist watch for and when?
“Patient should avoid consuming high-salt containing foods”	This is not monitoring – it is a counseling point or a non-pharmacologic recommendation
“Patient to monitor for side effects”	This monitoring parameter is not specific and has no timeframe – who should ask the patient and how often?
“Physician should discontinue treatment if liver enzymes exceed 3x the upper limit of normal”	This is not monitoring – it is a recommendation

Follow Up

- **Who** will follow up on the suggested monitoring parameter and **when**?
- Under what circumstances should a patient contact physician, pharmacist, or other healthcare provider sooner?

Follow Up

SMART monitoring	Follow-up
“Evaluate WBC and temperature for downtrend daily.”	
“Assess patient’s ability to walk up stairs weekly during physical therapy appointment.”	
“Evaluate patient’s pain scale rating in one week after starting new medication.”	
“Recheck potassium level 2 hours after supplementation dose given.”	

Assigning an Appropriate Timeframe for Monitoring and Follow Up

- Need to select a timeframe that is reasonable based upon:
 - Patient setting (outpatient vs. inpatient)
 - Expected amount of time for achievement of a therapeutic goal
 - Expected timeframe during which an adverse effect may occur
- Timeframe for monitoring can be set as a single time point or a frequency of monitoring
- Avoid a time frame of “during therapy” – be more specific

Assigning an Appropriate Timeframe for Monitoring and Follow Up - *Example*

- Patient to use clotrimazole cream for tinea pedis (athlete's foot)
 - Efficacy:
 - Monitor for resolution of itching within **1 week** following initiation of treatment
 - Safety:
 - Monitor for new burning sensation or irritation at application site **daily** following application
 - Follow up:
 - Follow up with primary care physician **1 week after completing treatment**
 - Follow up with primary care physician **if no improvement in condition after 1 week of treatment**

Resources for Monitoring/Follow Up

- Where to look if you're not sure how to monitor for a specific therapy or problem:
 - DiPiro's *Pharmacotherapy, the Handbook of Non-prescription Drugs*, disease state practice guidelines and top 300 drugs flashcards may be used for effectiveness or safety information
 - Drug monographs may also be useful for safety information/adverse effects
 - Lexi-comp, Micromedex, Facts and Comparisons, package insert, etc



Patient Case: Mike

- Mike is a 46 year old white male with no significant PMH.
 - He presents to your community pharmacy following a visit to his primary care physician with c/o ankle pain and swelling, which started yesterday while he was playing basketball with his son. He rates his pain as a 5 on a 10 point scale.
- Mike was diagnosed with an ankle sprain and the physician is recommended over the counter ibuprofen, along with RICE therapy, to help reduce the pain and swelling.

