

Patient Assessment in Clinical Pharmacy

A Comprehensive Guide

Sherif Hanafy Mahmoud
Editor



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*For my wonderful wife, Sally, who is always supportive of my
crazy endeavors*

*For my precious kids, Basant, Omar, and Ali, for being the
pearls of my life*

*For every pharmacist, who strives to make life better for their
patients*

Foreword

The educational training and the role of pharmacists as medication expert healthcare professionals for patient-centered care in the twenty-first century require comprehensive patient assessment. One of the most important skill sets a pharmacist will use in clinical practice is patient assessment. An important aspect of pharmacy practice is effective communication and taking both clinical and scientific information and translating that for patients. Pharmacists work both independently and in teams, and they are professionals who effectively communicate and have a passion for enquiry and seek to understand patients holistically. Canadian pharmacists are some of the greatest luminaries and innovators in the pharmacy profession, and the practice of pharmacy in Alberta has often led the way.

Patient Assessment in Clinical Pharmacy: A Comprehensive Guide is divided into four parts:

Part I. The three introductory chapters provide a foundation of the patient care process and set forth the principles of patient and physical assessment to be followed.

Part II. Symptoms assessment is divided into eight succinct chapters of mental and physical features that may indicate a disease or condition and particular features that are often apparent in assessment of patients by pharmacist clinicians. As pharmacists routinely diagnose and treat common illnesses and refer their patients when required, the highlighted symptomology in this guide can be a sign of an undesirable manifestation, adverse effects, or existence of disease in a patient requiring further follow-up.

Part III. Chronic illness assessment is discussed in a series of ten chapters reflecting some of the major diseases that are often managed by pharmacists independently and in teams involving various body systems including endocrine, cardiovascular, pulmonary, neurology, and musculoskeletal. The pharmacist's role in chronic disease management and self-care is of paramount importance to optimal health outcomes.

Part IV. Specialized assessments are a clinical cornerstone of pharmacy practice, and this section reflects nine areas involving laboratory testing and clinical practice beginning with pharmacokinetic assessment of drug disposition for drug monitoring, extending to laboratory value and biomarker assessment of major organ systems as well as chemical pathology, hematology, blood gases and coagulation, microbiology and immunology,

and an overall understanding and interpretation of clinical biochemistry and assorted diagnostics.

Overall, this guidebook is a reference for pharmacist practice designed for and by pharmacists to augment existing knowledge and skills and to optimize practice and is a welcomed addition to a paucity of focused literature on this subject. This textbook is intended to fill the significant educational apertures in patient assessment that are contemporarily required by pharmacists and educators to provide primary care patient-centered pharmacy services. This textbook further reflects current Canadian pharmacy practice guidelines where applicable and extends them where necessary and prudent. This is a seminal Canadian-authored reference patient assessment book that is intended for a global audience. The potential of this guide to be adopted by pharmacy schools and pharmacists as well as other healthcare professionals is indicative of its quality and the caliber of the pharmacy practitioners and academics in Alberta and throughout Canada and their erudite insights into medication expertise for patient-centered care.

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Preface

Pharmacists' role as healthcare practitioners is evolving as they are taking a more active part in primary patient care. Clinical services are now becoming the forefront of pharmacy practice as pharmacists are helping patients manage their medications and diseases, providing patient education and, in some jurisdictions, prescribing and adapting medications. As medication experts, pharmacists' interventions in patients' care have been shown to improve patient outcomes and reduce healthcare costs in various practice settings. In order to perform their day-to-day duties, pharmacists need a framework to guide care for their patients. This framework is called the patient care process, and it involves three main steps: patient assessment, care plan development, and implementation and monitoring and follow-up. An essential part of the patient care process in addressing patient concerns is complete patient assessment. Patient assessment skills apply to all pharmacy practice settings, including community, hospital, and specialized pharmacy practice. The importance of patient assessment skills together with the scarcity of resources in this topic initiated the idea of this book. The aim of this book is to provide a comprehensive discussion of patient assessment for clinical pharmacists. It is organized into four parts. Part I includes introductory chapters regarding the basics of patient assessment and components of the patient care process. Part II includes a detailed assessment of common symptoms encountered by pharmacists in their practice. Part III discusses assessment of patients with various chronic illnesses. This is followed by Part IV, which addresses select specialized topics and assessment considerations of interest to pharmacists such as pharmacokinetic assessment, critical illness assessment, and assessment considerations in older adults and pediatric patients. This book targets all pharmacists, regardless of their practice setting, and pharmacy students, serving as a valuable tool and resource in their daily practice.

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Part I

Introduction



Introduction to the Patient Care Process

1

Theresa L. Charrois

Chapter Objectives

1. Define and understand the role of the patient care process in providing care.
2. Describe the components of comprehensive patient history taking.
3. Apply a process to patient assessment that can be used in a variety of different patient care settings.
4. Apply a process to assess a patient for drug-related problems.
5. Outline the components of patients' comprehensive care plans.
6. Develop appropriate documentation of patient care.

Background

Pharmacists play an important role in patient-centered care. Being the most accessible of the healthcare team members, pharmacists' role as healthcare practitioners is evolving as pharmacists are taking an active part in primary patient care. With the continuously expanding pharmacists' scope of practice, there is a need for a framework for pharmacists to provide a consis-

tent patient-centered care. Research has shown that pharmacists who are directly involved in the care of patients improve the health outcomes of patients; therefore, it is important for pharmacists to have a fundamental process to provide patient-centered care [1–4].

The patient care process provides such framework and is central to our identity as pharmacists. It is what defines our role as professionals. It includes our scientific knowledge of medications, our clinical knowledge, and our interaction with the patient. The patient care process is a continuous and dynamic mechanism to provide patient care (Fig. 1.1) and includes the essential components that can be adapted to suit various practice settings:

Step 1: Patient assessment

Step 2: Care plan development and implementation

Step 3: Monitoring and follow-up

Assessment of the patient (including a complete history and understanding of why they are seeking care) and assessment of current medications are vital to ensure appropriate care is being provided to the patient (Step 1). Developing a care plan including all drug-related problems, along with goals and implementation of recommendations, is the next step of the process (Step 2). Finally, appropriate monitoring and follow-up helps to ensure goals are being met and that safety is being monitored (Step 3). This framework is

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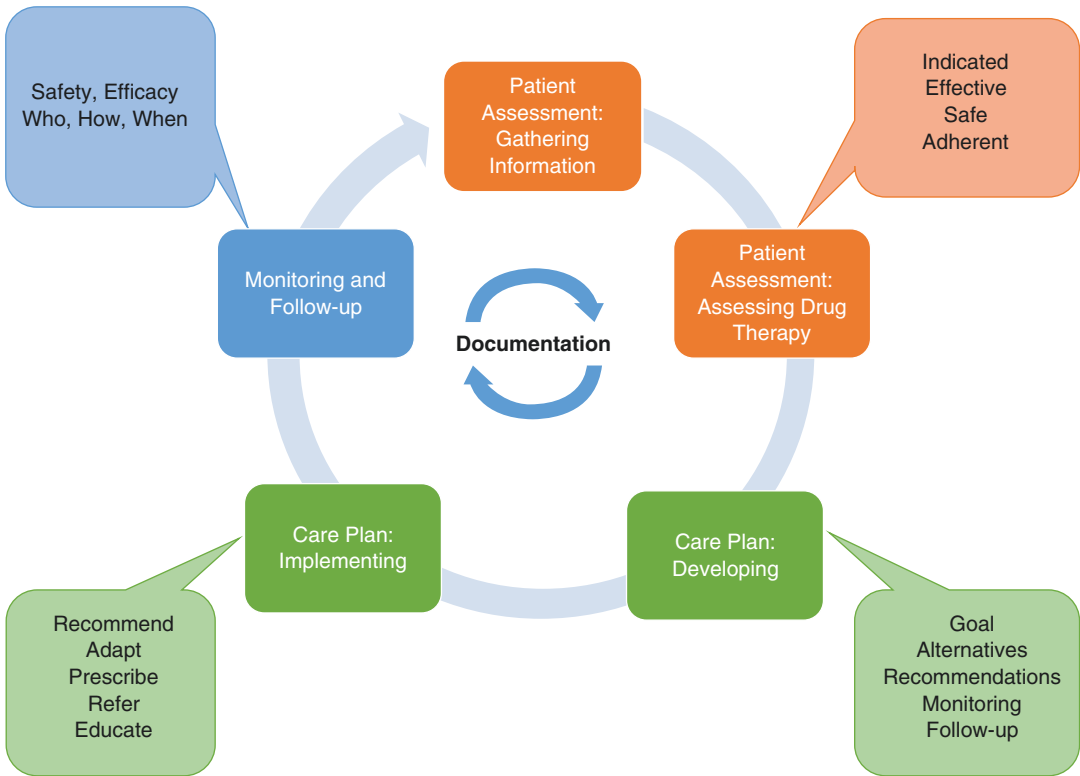


Fig. 1.1 Patient care process

consistent for complete pharmacist assessments of a patient, as well as for targeted assessments, that may be specific to a medical condition. Patient care is then documented to ensure that it is communicated to all other members of the healthcare team.

Assessment

The key purpose of an assessment in pharmacy practice is to determine if a patient's drug therapy needs are being met [5]. Assessment can occur during various types of encounters; for example, at prescription drop off, during routine refill pickup, or during over-the-counter medication (OTC) counseling. Often, pharmacists think assessment can only happen in a private room during a thorough patient interview; however, it should be occurring at any stage of the medication use process. The specific elements of the patient assess-

ment will change based on the situation, i.e., an assessment at refill will differ from an assessment with a new prescription, but the same overall process can be applied regardless of scenario or setting. Within the patient care process there are two primary components of assessment: (1) assessment of the patient, including the patient interview, and (2) assessment of current drug therapy to determine if there are any drug-related problems.

Assessment of the Patient: The Patient Interview and History Taking

Prior to conducting the interview, the pharmacist should establish a relationship with the patient to ensure trust-building and that the patient's goals are clearly defined. This is followed by the structured patient interview. In order to assess a patient, the pharmacist will need to collect

relevant information through multiple sources such as the patient interview, electronic medical records (EMR) (prescription records, lab values, diagnostic tests, etc.), and physical examination. Complete and relevant patient history taking is essential for proper patient assessment. By collating this information, the pharmacist can develop a patient database suited for their particular setting. The information collected and inputted into the database can then be used to assess the patient and develop a care plan.

As part of the patient interview, the pharmacist needs to determine the following: (1) the patient's reason for seeking care, (2) their current symptoms (if presenting with a specific complaint), (3) medical history, and (4) medication history.

In determining the patient's reason for seeking care, it is imperative that the patient's perspective is considered. The patient's goals need to be the priority and can be negotiated with the pharmacist's goals as a care provider. By incorporating the patient's goals into pharmacists' assessment, they can create a sense of trust and shared values for moving forward in a treatment plan.

Symptom assessment can be done in a variety of ways but the key pieces of information that need to be collected remain the same: the region/location, what helps or worsens the symptom, the severity, and the temporality of symptom onset. By using appropriate questions to get at each of these elements, the pharmacist can have a better and more complete understanding of the patient's primary symptom concern. Readers are referred to Chap. 2 for an in-depth discussion on symptom assessment.

A complete and thorough medical history including current and ongoing medical issues, resolved medical issues, and surgical history is a vital part of the process. In certain cases, a pharmacist may need to use physical assessment skills (Chap. 3) to evaluate current conditions, symptoms, and even safety and efficacy of their medications. Whether or not physical assessment is required as part of the patient assessment is dependent on the presenting complaint, reason for seeking care, and the setting where care is being provided.

Clearly, a complete medication history is our true domain as pharmacists, but pharmacists have to ensure they capture the many facets of medications use. Specifically, the medication history needs to include current and past medications, allergies, adverse reactions, immunizations, and patient adherence. Often, patients do not consider natural health products or over-the-counter medications as part of their medication list, and those products should be specifically interrogated. Other factors that may affect drug therapy should also be considered, such as social history (tobacco, alcohol, and recreational drug use) and relevant dietary information. Information such as social history may not always be relevant; therefore, some judgment needs to take place before asking relevant questions. In addition, these questions should be asked in a nonjudgmental way, to again ensure the development of trust between the patient and the pharmacist [6].

At the end of the interview, the pharmacist should be able to determine what is going on with a patient (in terms of presenting complaint and symptoms) and the patient's primary concerns. From this point, the pharmacist can specifically assess the patient's medications. Table 1.1 provides a summary of the elements of comprehensive patient history.

Assessing Drug Therapy

After patient information is collected, the pharmacist must then determine if the patient's current drug therapy is appropriate. The four primary questions a pharmacist should consider for each medication are the following:

- Is this medication indicated?
- Is this medication effective?
- Is this medication safe?
- Is the patient being adherent to this medication?

These can be remembered using the acronym IESA: indicated, effective, safe, and adherent. In addition, the pharmacist should consider if there are medical conditions that are not currently treated but may require drug therapy, as a lack of

Table 1.1 Summary of the elements of comprehensive patient history

Elements of a Patient History	Details
History of present illness (HPI)	Assessment of presenting symptoms/complaint SCHOLAR (see Chap. 2)
Medical History; Past medical history (PMH)	Current and previous medical conditions Hospitalizations, surgeries
Medication History	Current medications – indication, dosage, duration (link to current medical conditions), adherence Previous medications Nonprescription medications – including complementary and alternative medications, vitamins, minerals, over-the-counter medications Immunizations
Allergies	Include reaction (date, onset, symptoms, management)
Social History (SH)	Lifestyle considerations – diet, exercise, living conditions Substance use – caffeine, alcohol, tobacco, recreational drug use
Family History (FH)	First degree relatives Focus on conditions with familial linkages such as cardiovascular disease, diabetes, cancer etc.
Laboratory	Complete blood count, electrolytes, renal function (including calculated CrCl), liver function, microbiology, etc.
Review of Systems (ROS)	Head to toe assessment Integumentary, head/neuro, eyes/ears/nose, neck, chest/lungs, cardiovascular, gastrointestinal, urinary, hepatic, renal, reproductive, musculoskeletal, endocrine

drug therapy for a condition is also a drug-related problem. When assessing indication, there should be a clear reason why a patient is on each medication. In addition, you should determine if the medication they are on for a condition is the most optimal therapy – based on the relevant guidelines for practice, comorbidities, and outcomes.

For effectiveness, it makes the most sense to determine what the important patient outcomes and clinical outcomes are for a condition, and if these are being met. This relates back to optimizing therapy. Considerations such as dose increases or additional therapy being added should be taken into account if drug therapy is not effective.

In terms of assessing safety, the main issue we should consider are the adverse effects from the medications. This includes a general overview of common adverse effects of a drug, as well as those rare adverse effects that could be harmful. Asking the patient the question “Are you having any side effects?” is not always helpful, because patients may not link symptoms to drugs. Questions should be tailored to the specific drug. In addition, medication safety can be assessed by reviewing appropriate lab work that was collected

during the patient assessment. Drug interactions are also part of a complete assessment of safety parameters; this includes determining if the drug interaction is potentially relevant to this patient and the possible severity of the interaction if the interacting medications are continued.

Medication history also includes an assessment of adherence. When assessing drug adherence, pharmacists should ask the patient in a relevant time period, how often they forget their medications; i.e., *how many pills have you missed in the last week?* This is a relatively non-judgmental approach to assessing adherence, and judgment when asking about adherence could lead to false answers. When a patient expresses that they are sometimes nonadherent, the pharmacist needs to assess what factors may be leading to this nonadherence in order to help develop strategies to overcome it, such as education, or reminder systems. Nonadherence can be due to multiple factors and can be purposeful or unintended. An assessment of the root cause of the nonadherence will help in decision-making about possible ways to improve it. Adherence may also be medication specific, so assessing adherence globally may not always provide an accurate

Table 1.2 Example of assessing drug therapy appropriateness

Medical Conditions	Medications	Other Information
Hypertension	Hydrochlorothiazide 25 mg daily	CrCl = 75 mL/min BP 126/72 No reports of dizziness, falls Misses dose once/month <i>(information can be used to assess efficacy and safety)</i>
Seasonal allergies	<i>(not currently treated – potential DRP)</i>	Only in spring
<i>(no current indication – potential DRP)</i>	Omeprazole	Previously had <i>H. pylori</i> (1 year ago) No current symptoms of reflux

depiction of actual medication use; questions may need to be targeted to the individual drugs. Both adherence information and assessing drug safety may actually be uncovered during the initial patient interview. Further details regarding adherence are discussed in Chap. 2.

After working through the four medication assessment questions (indicated, effective, safe, adherent), the easiest way of approaching the next step of drug therapy assessment is to link medical conditions to medications. An example is shown in Table 1.2. By linking medical conditions to medications, pharmacists can identify if all conditions are being adequately treated or if all medications have a relevant indication. In addition, monitoring information can be included to assess efficacy and safety. This is a good first step in assessing the appropriateness of a person's drug therapy.

In Table 1.2, the IESA questions are depicted to provide an example of application to a patient scenario. In this example, you can determine that hydrochlorothiazide is indicated for the patient's hypertension and the effectiveness of the hydrochlorothiazide therapy from assessing the blood pressure (BP). Safety may need to be further explored through other questioning on adverse effects, such as dizziness. Adherence is also indicated in the assessment. It is clear from this basic format, that there are no drugs currently being used for seasonal allergies, but perhaps through your initial patient assessment you determined it was unnecessary as the patient preferred to take nothing. In addition, you may determine there may be no indication for the omeprazole, and that may need reassessment.

From this assessment of indicated, effective, safe, and adherence, you can develop a list of

potential and actual drug-related problems. It is the identification of these drug-related problems that leads the pharmacist into the next step of the patient care process, which is developing a care plan.

Care Plans

The purpose of a care plan is for a pharmacist to document their assessment of a patient, along with a plan for resolving and monitoring medical conditions and medications. A care plan can take many forms and a variety of templates are available to assist in this process. Table 1.3 provides one example for a template of a care plan. A care plan should not be kept separate from other patient care records, as it is a documented plan for care that other pharmacists on the team, or other health-care professionals in the pharmacist's setting may want to refer to as well.

The primary aspects that should be included in the care plan, after the patient's database is created, are the drug-related problems which were assessed, and for each problem: *goals, alternatives, and recommendations*. *Goals* are meant to be specific to a patient and not just broad and overarching. For example, when considering goals of therapy for blood pressure treatment, you would want to include a specific target blood pressure based on the patient's comorbidities and on current guidelines but also consider any parameters specific to that patient, such as minimizing postural hypotension in a patient who is already concerned about falling. The patient should be asked what their goal is with therapy to help construct goals that make sense to their

Table 1.3 Example care plan template

<p>MEDICAL CONDITIONS & MED-RELATED NEEDS: List and prioritize each medical condition first, followed by any DRPs identified for a given condition. Although some medical conditions may not have a DRP, a care plan is still necessary for ongoing patient monitoring.</p>
<p>GOALS OF THERAPY: For each medical condition and/or DRP state desired goals of therapy/timeframe. Goals: cure, prevent, slow/stop progression, reduce/eliminate symptoms, normalize a lab value. <i>Consider realistic goals determined through patient discussion. Goals of therapy are measurable or observable parameters that are used to evaluate the efficacy and safety of therapy.</i></p>
<p>ALTERNATIVES: Compare relevant drug and nondrug therapies that will produce desired goals. List the <i>pros</i> and <i>cons</i> of each therapy as well as rationale for each being included. <i>Consider: Indication • Efficacy • Safety • Adherence • Cost/coverage</i></p>
<p>RECOMMENDATIONS/ PLAN: In collaboration with the patient and other healthcare providers, select the best alternative and implement the plan. Provide a rationale for the chosen plan relative to the other alternatives considered. <i>Consider: Drugs: correct drug, formulation, route, dose, frequency, schedule, duration, medication management. Nondrug: nondrug measures, education, patient referral.</i></p>

lifestyle. Not all care plans require *alternatives* for management; however, it is a clear way to follow someone's thought process as to why a particular medication was chosen. By listing relevant and appropriate alternatives, as well as consideration of the pros and cons of each, a pharmacist can be transparent with their decision-making process of determining optimal therapy. From this list of alternatives, a *recommendation* should then be determined. This may mean a need for drug therapy, additional drug therapy, or stopping drug therapy. Lifestyle parameters, such as diet and exercise, can be included in this section as well. Education needs for the patient regarding medical conditions and medications should also be addressed. The recommendations should be succinct but clear, with a plan for who is taking care of each part of the plan.

Monitoring and Follow-Up

Monitoring plans should be developed for each and every drug-related problem. Depending on the situation, you may want to develop a monitoring plan that encompasses all the included drug therapy problems and recommendations, as there could be overlap. For example, in a combined monitoring plan, you could include all required

follow-up lab testing in one place. This helps ensure consistency in follow-up parameters, and not sending the patient at multiple time points for blood tests, or for multiple visits to care providers.

For monitoring, specific parameters for both efficacy and safety should be indicated. Efficacy parameters relate directly to the goals of therapy, and the outcomes that are targeted. Safety parameters generally relate to side effects of the medications. Parameters, both for efficacy and safety, can include signs and symptoms, as well as laboratory parameters.

In addition, it is important to indicate who is responsible for the appropriate follow-up. In jurisdictions where pharmacists can order lab tests, the pharmacist can be the person to follow-up on lab results, but that may not always be the case. In addition to noting the respective person responsible for follow-up, a timeframe for when each parameter is monitored needs to be determined. Follow-up visits with patients can be used for a variety of reasons: assessment of meeting goals and outcomes, effectiveness of drug therapy, safety of drug therapy, and also the assessment of any new drug-related problems (using the parameters of indicated, effective, safe, and adherent). Therefore, follow-up visits should be considered a vital component in the care provision of patients.

Table 1.4 Example monitoring and follow-up plan

Medical condition	Parameter	Frequency	Rationale
Hypertension (treated by ramipril 5 mg po BID)	Efficacy: BP <120/80	Daily (by patient – home BP monitor); every 3 months (by family doctor); at refills (by pharmacist)	Target based on patient's comorbidities
	Safety: potassium, SCr, cough	1 week after initiation of ramipril; prn afterwards	
Diabetes (treated by metformin 750 mg po BID)	Efficacy: A1c <7%	q3 months (by pharmacist)	Target hemoglobin A1C as per guidelines
	Fasting blood glucose pre-meals 4–7 mmol/L post-prandial blood glucose 5–8 mmol/L	3× per week (by patient)	
	Safety: GI disturbances such as diarrhea	At refills (by pharmacist)	

BID twice daily, *BP* blood pressure, *GI* gastrointestinal, *prn* when needed, *SCr* serum creatinine

An example of a complete monitoring and follow-up plan is included in Table 1.4. This example is a monitoring plan developed based on the patient's medical conditions.

Documentation

A care plan is meant to be used as a tool specifically for pharmacists, whereas documentation is meant to be a legal document of care provided to a patient and to inform other healthcare providers what care you provided to the patient. Usually, a care plan is significantly longer and more thorough, whereas a documentation note is shorter and more succinct. Documentation is essential owing the following reasons:

- To help maintaining patient safety
- To comply with legal requirements
- To avoid duplication of work
- To facilitate communication
- To comply with standard of practice in different jurisdictions
- To facilitate quality assurance

Documentation can take many forms, such as a quick note in dispensing software, or a longer consult letter that is related to only one particular concern. Notes can be structured (such as DAP, SOAP) or unstructured such as those focused on a complete medication history or only on one specific problem (e.g., assessment of drug levels). Only care that has

been documented can be assumed to have been provided: if you did not document the care, it did not happen [5]. A practitioner's documentation will be highly dependent on where they practice, requirements for that place of practice, and how care is communicated between practitioners.

Structured Documentation

By using a structured format to help guide documentation, a pharmacist can ensure the essential information is included. Two common formats are used in practice: the DAP note and the SOAP note. A DAP note includes data, assessment, and plan. Other types of structured documentation can include preprinted forms often used in care facilities and hospitals such as medication reconciliation or allergy assessment forms.

The difference between a DAP note and a SOAP note is that in a SOAP note, the data is further separated into subjective and objective data. Data includes a succinct summary of the information collected in the patient interview that is relevant to the problem being discussed. Only data that relates to the patient assessment that was completed should be included; including too much data that is not directly related to the purpose of the note can make the DAP note unreasonably long. Long notes run the risk of not being read by other members of the care team. Other elements to

include in the data section are the patient's goals and preferences.

The assessment component of the note is the pharmacists' assessment and determination of what the drug-related issue is and the rationale behind the assessment. This includes the pharmacists' professional interpretation of the data presented. The rationale should be clear so that other health-care providers can understand the assessment and consequently, the plan.

The plan includes specific recommendations for the problem, as well as follow-up and monitoring. Recommendations or prescribing decisions should include specifics of dose, route, and duration. Recommendations can also include nonmedication focused interventions such as lifestyle factors. Follow-up should include who is doing what elements of follow-up, so work is not being duplicated. In addition, it should include the timeframe for monitoring and follow-up. Two examples of DAP notes are provided in Boxes 1.1 and 1.2.

Box 1.1 Structured Documentation

Example 1: Community Pharmacy

August 1, 2018 9:30 am: Rx#1234567
New prescription for hypertension

Data:

- Mr. Y received a new prescription for hydrochlorothiazide 25 mg daily
- Average BP over last 3 pharmacy visits: 150/82 (May 2018); 153/79 (June 2018); 157/90 (July 2018)
- SCr 85 $\mu\text{mol/L}$, calculated CrCl 95 ml/min, K⁺ 4.2 mmol/L (labs done yesterday)
- No other medications or medical conditions
- Patient expresses concern about started a regular medication

Assessment:

- Hydrochlorothiazide is indicated as first-line treatment for hypertension and

dose appears appropriate. Target for patient is BP <140/90.

Plan:

- Pharmacist to check SCr, K⁺ in 1 week
- Pharmacist to assess for safety in 1 month at next refill – dizziness, postural hypotension
- Pharmacist to assess for efficacy at next refill: BP measurement in pharmacy
- Pharmacist counseled patient on how to take medication and common adverse effects; discussed patient's concerns about starting medication and offered suggestions to ensure adherence
- Patient to monitor BP at home daily for first week, then a few times a week until next refill. Pt will call pharmacist if any concerns.

Abbreviations: Rx#, prescription number; BP, blood pressure; SCr, serum creatinine; K⁺, potassium

Box 1.2 Structured Documentation

Example 2: Hospitalized Patient

Pharmacist's note RE: Vancomycin

D: 47 F (70 kg, 176 cm) admitted to the hospital for traumatic brain injury 6 days ago. She was started on vancomycin 3 days ago for MRSA hospital acquired pneumonia.

Vitals (today): T_{max} 37.2 (was 38.7); BP 138/75; HR 75; RR 13; O₂ sat 95% currently on room air (was on 4L O₂ 3 days ago)

Labs: SCr 75 $\mu\text{mol/L}$ (stable); est. CrCl ~ 87 ml/min; BUN 7 mmol/L; WBC $9 \leftarrow 13 \leftarrow 19 \times 10^9/L$; Neut. $6 \leftarrow 10 \leftarrow 14 \times 10^9/L$

Microbiology: Sputum culture (4 days ago): 3+ MRSA sensitive to vancomycin

Chest X-ray (3 days ago): LLL pneumonia
Current antibiotics: Vancomycin 1 g iv q8h started 3 days ago (dose times 00:30, 08:30, 16:30)

Vancomycin level drawn today at 00:02 was 17 mg/L (pre sixth dose)

A: Patient is appropriately treated with vancomycin given the MRSA pneumonia. Vancomycin level was drawn appropriately pre sixth dose and was within target for MRSA pneumonia (15–20 mg/L) and most likely reflects steady state given patient’s weight and renal function. The patient is clinically improving (afebrile with less oxygen requirements; improving WBC and neut.)

P: Continue vancomycin at the current dose 1 g iv q8h for a total of 14 days. Team to monitor SCr and CBC at least 2× per week as long as patient on vancomycin. Pharmacist to follow up and order vancomycin levels as appropriate.

Abbreviations: A, assessment; BP, blood pressure; BUN, blood urea nitrogen; D, data; F, female HR, heart rate; P, plan; LLL, left lower lobe; MRSA, methicillin-resistant *Staphylococcus aureus*; RR, respiratory rate; SCr, serum creatinine; T_{max} , maximum temperature in 24 h; WBC, white blood cells count

- Done in a timely manner – ideally during or immediately after care provided.
- Concise – notes should be short and to the point.
- Complete – assumptions should not be made about missing information.
- Avoid dangerous abbreviations – e.g., use “daily” instead of “qd.”
- Use professional tone and avoid terms such as inappropriate, unnecessary; avoid judgments or blame for errors.

Conclusion

Utilizing a structured process to approach patient care ensures that pharmacists are both thorough and complete, and that all actual and potential drug-related problems are identified. Assessment starts with interviewing the patient, and creating a database which includes all relevant details of the patient’s medical and medication history. From there, the pharmacist can assess drug therapy by considering the four following parameters: indicated, effective, safe, and adherent. After this initial assessment, a care plan can be developed (including recommendations) and implemented with appropriate follow-up and monitoring. Documentation is essential, so practitioners can be accountable for care provided. These are the essential element of the patient-care process which is the heart of the care pharmacists provide.

Unstructured Documentation

There are situations where a full DAP note is not required, such as a note to clarify a previous order, a follow-up note, allergy assessment, renal dosage adjustment, etc. A pharmacist should use their professional judgment about when an unstructured note is appropriate, and when in doubt, should err on the side of a structured note to ensure completeness of documentation.

Some key elements that should be considered in all forms of documentation are that documentation should be:

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Principles of Patient Assessment

2

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Chapter Objectives

1. Describe the role of patient assessment in pharmacy practice.
2. Describe the steps of symptoms assessment.
3. Demonstrate an understanding of chronic disease assessment at both the initial presentation and follow-up.
4. Apply the principles of patient assessment to allergy, adverse reactions, and drug interaction assessment.

Background

The pharmacist's role as health-care practitioner is evolving as pharmacists are taking a more active part in primary patient care. Clinical services are now becoming the forefront of pharmacy practice as pharmacists are helping patients manage their medications and diseases, providing patient education, and, in some provinces, prescribing and adapting medications. Pharmacists can be accessed in a variety of practice settings—for example, in community pharmacies, in the hospital, and in specialized practices. This wide

range of practice settings gives pharmacists the opportunity to be involved in patient care for a variety of patients, from those who are acutely ill to those in long-term care. Pharmacists' involvement in patient care can make a significant difference to clinical outcomes and patient care and can decrease medication-related adverse events.

Pharmacists are the health-care professionals most accessible to the public. Patients frequently approach pharmacists with their health-related questions. Many of these questions center around patients with acute minor illnesses who request a pharmacist to help them select an over-the-counter product. Furthermore, frequent visits to the pharmacy for medication refills provide an opportunity for pharmacists to have regular follow-ups with patients and to be involved in chronic disease management. Finally, as the medication experts, pharmacists have a significant role in ensuring safe medication use for each patient throughout his/her treatment course. All of these roles require pharmacists to be familiar with and capable of providing patient assessment.

Patient assessment is the process of methodically collecting information while also using clinical judgment and therapeutic knowledge to identify patient's actual and potential drug-related problems. The data collected can be objective, such as lab tests or diagnostic imaging, or subjective, such as those obtained from the patient. Patient assessment is a skill that requires an organized process and knowledge of the presenting

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symptom or disease. Pharmacists are required to be able to identify red flags and important patient-specific characteristics throughout the assessment. With this information, the pharmacist can formulate a plan and, if appropriate, provide patient education, a drug or nondrug recommendation, or a referral to another health-care practitioner. Although patient assessment is a clinical task, it also requires strong communication skills, as the patient is a major source of information. The ability to connect with the patient and conduct a patient-centered interview is another facet of a patient assessment that cannot be forgotten.

There are different types of patient assessments due to the wide range of symptoms, diseases, and medications that can be encountered by pharmacists. A symptom assessment could be conducted when a patient presents to the pharmacy requesting a recommendation for a minor ailment, such as a cough. Patients with chronic diseases, such as diabetes, could require a chronic disease assessment at both their initial diagnosis and at regular follow-up visits. In addition, patient assessment involves an approach to assessing adverse reactions, allergies, and drug-drug interactions. Patient assessments are part of the patient care that pharmacists provide and have a significant role in the provision of clinical services.

This chapter provides an overview of patient assessment. Patient assessments specific to a symptom or disease can be found in the respective chapter.

Connection for Effective Patient Assessment

Patient assessment not only relies on the gathering of patient's diseases, medications, physical assessments, and laboratory values but also on gathering a patient's lived experience with the disease and medications [1, 2]. These are often referred to as the illness and medication experience, respectively, and are valuable in identifying the causes of a patient's medication-related problems [3]. A patient-centered interviewing approach, Smith's Patient-Centered Interview: An Evidence-Based Approach, was created to

gather lived experiences alongside traditional biomedical information [4]. This model recognizes the complexity of collecting the patient's perspectives alongside specific clinical data. More than 30 years of research indicate that patient-centered interviewing increases clinician job satisfaction, elicits increased patient information, reduces malpractice suits, improves adherence, and improves patient outcomes, including blood pressure and diabetic control [4].

Patient-centered interviewing has three main stages [4]. First, clinicians are first encouraged to connect with the patient and set an agenda followed by patient-centered interviewing to explore patients' illness and medication experiences and the impact on their lives. Pharmacists would invite patients to share their story, encourage the sharing of the personal and emotional context, respond to emotions, and summarize the information to check for accuracy. Pharmacists could explicitly transition to the middle stage with clinical-centered interviewing where the pharmacist would obtain a medical and medication history followed by a physical exam as required. In the end stage, the pharmacist could share information and make a plan.

The quality of patient assessment and patient-centered interviewing depends on pharmacist and patient connection. A high quality of the physician-patient relationship can improve patient health, including measures such as blood pressure, pain scores, and quality of life [5]. While comparable research is not available for pharmacists, patients have requested that pharmacists should recognize them as individuals. Although not all patients feel a need for an ongoing relationship with their pharmacist [6–8], most patients wanted to feel a connection and to be treated with respect in all pharmacist encounters [9]. Establishment of patient connection, whether it leads to a relationship or not, relies on the pharmacist's frame of mind as well as strong communication skills.

Mindful Practice

Pharmacists have been called on to enhance their clinical skills and reduce medication errors by

cultivating a mindful practice [10, 11]. The qualities of a mindful practice include observing one's thoughts and judgments, maintaining curiosity, and acting with compassion [12]. Specifically, in pharmacy practice, Shoemaker suggests that pharmacists should listen to the patient's story, acknowledge individuality, and be curious about one's patient [13]. Mindfulness can be as simple as taking a single deep breath to focus one's self before meeting with a patient and can extend to formal mindfulness practice. A practical and evidence-based approach for professionals has been outlined in *Search Inside Yourself* [14]. In the health context, limited research suggests that mindfulness training may reduce physician burn-out [6] and increase attentiveness [15].

Communication Skills

Patient connections are facilitated by strong pharmacist communication skills, which can be learnt through practice [9]. Connection can be established early in the encounter when pharmacists introduce themselves and take a moment for small talk. These routine greeting rituals recognize a patient as an individual and may lead to insights about a patient's goals and preferences. Pharmacists should use a patient's name, as this shows respect and recognition that again fosters a connection. While these ideas are self-evident, their importance is easy to overlook in a fast-paced practice.

Patients often perceive pharmacists, whether in a community pharmacy, hospital, or clinic, as busy clinicians who may not have time for them. Three specific skills can help pharmacists efficiently create the necessary space for connections: acknowledgement of time, private space, and agenda setting. First, pharmacists can pause and reassure a patient that there is time, despite the fact that the environment may appear busy. Otherwise, patients may choose to save their concerns for another time. Second, pharmacists can offer a private area to talk (if appropriate). Many patients are not aware that pharmacists have space; however, patients are quite aware of the people standing behind or sitting near them

who could overhear their conversation. A pharmacist could take the lead by saying "Why don't you come with me to a private area, so we will not be interrupted?" Third, pharmacists could set an agenda even for brief conversations to identify patient questions as well as prevent important questions at the end. Pharmacists can simply ask the patient what they would like to talk about and then follow-up with "what else" until all topics raised. The pharmacist and patient can then agree on what can be discussed at present and what can be scheduled in the future. Patients are often reluctant to raise all concerns, and encouragement helps prioritize issues.

Symptom Assessment

A symptom assessment is a process a pharmacist uses to collect information regarding a symptom a patient is experiencing, such as a cough, sore throat, or a headache. Pharmacists conduct numerous symptom assessments during a single shift. Patients commonly seek pharmacist advice on how to treat their minor ailments and are looking for recommendations on an over-the-counter (OTC) product. Before a pharmacist delves into collecting information on a symptom, it is important to obtain a brief medical and medication history from the patient. This information can affect the questions asked during the assessment and the end recommendation. Throughout the process of the symptom assessment, the pharmacist should be aware of patient-specific characteristics that could affect the pharmacist's advice or plan. Such patient-specific characteristics include age, comorbidities, pregnancy or breastfeeding status, and medication history. Patient-specific characteristics are also important when the pharmacist is assessing for the presence of red flags. A red flag is a symptom or patient characteristic that alerts the pharmacist that there could be a more severe underlying problem and often referral to another health-care practitioner is required. Some examples of red flags would be the presence of a new onset headache at 50 years or older or blood in the stool with diarrhea. If a pharmacist identifies a red flag, it is important to inform

the patient of the next step, which is often seeking additional care. The pharmacist should also advise the patient how urgent the need to seek the attention of another health-care practitioner is, such as the need to make an appointment with his/her family physician or the need to immediately proceed to the emergency department. For patient-specific characteristics and red flags that are relevant to a particular symptom, please refer to the respective chapter related to that topic.

Conducting a thorough symptom assessment is important to get the full history of the symptom, recognize red flags, and make a final recommendation to the patient. Although the goal is to conduct a comprehensive assessment, this can be lengthy and is not always feasible concerning the pharmacy workload or the patient's time. Possible time constraints are why it is important to have a developed process when conducting an assessment, which allows you to gather the information in an organized and efficient manner. An organized process also helps pharmacists know that they have not missed important information during the assessment or on the other hand are repeating questions that will bring forth already known information.

An assessment should begin with an introduction so that the patient knows he/she is speaking to a pharmacist. The next step is to determine the patient's chief complaint and his/her reason for seeking care. It is essential to know the chief complaint before gathering the patient's history as it may help the pharmacist pick-up on key parts of a patient's history or patient characteristics when conducting the rest of the assessment. For example, if the patient has constipation and you begin to conduct a patient history, and he/she is taking opioids for chronic pain then you will be primed to ask specific questions about this possible relationship during the symptom assessment.

Many acronyms have been developed to help health-care practitioners with the assessment process. Some examples of acronyms include LQQOSMA (Location, Quantity, Quality, Onset, Setting, Modifying and Aggravating factors), SOCRATES (Site, Onset, Character, Radiation, Association, Time Course, Exacerbating and Relieving Factors and Severity), and SCHOLAR. In this book, we will be using SCHOLAR. SCHOLAR stands for Symptoms, Characteristics,

History, Onset, Location, Aggravating factors, and Remitting factors. Each category in this acronym has a purpose and methodically going through each step will help the pharmacist collect a full history. The first letter is S, for *symptoms*, which is an opportunity to ask about the chief complaint and inquire about any other symptoms the patient may be experiencing. The next letter, C, for *characteristics* focuses on the patient describing the symptom and the pharmacist learning about the quality and severity of the presenting symptom. This part of the assessment is also an opportunity to ask closed-ended questions about the presence or absence of specific characteristics that could also be present. Asking these particular questions can be helpful when determining if any red flags are present. Next, is the *history* section. The goal is to determine how long the patient has been experiencing the symptom and if the patient has experienced this ailment before. A thorough history can be helpful in identifying any red flags regarding the length of time the symptom has been present or its frequency. Also, if the patient has had the same symptom before it can be helpful to ask about any treatments tried in the past and if they were successful or not. *Onset* asks about when the symptom started and details about this time. This includes what the patient was doing at the time of presentation or if the patient has had any recent changes in his/her life. Determining the onset can help elicit the most likely cause, which could assist in deciding on symptom management. *Location* seeks to understand where the symptom is located in the body. It may be unnecessary to ask about location if it is obvious, such as with a sore throat or an earache. If the patient is complaining of pain; however, it is important to know the location as well as if the pain is radiating. *Aggravating* and *remitting factors* explore what makes the symptom worse or better and also if the patient has tried any treatment at this point and if that has been successful. Examples of questions in each category can be found in Table 2.1. It is important to note that not all questions will be relevant to every symptom assessment. For specific symptom assessment questions, see chapters on the related topic.

After completion of this process, the pharmacist should have a clear picture of the presenting symptom. Further questioning may be required to gather more specific information if needed.

Table 2.1 Examples of SCHOLAR questions

Part of assessment	Examples of questions
Symptoms	<i>What is your main symptom? Are you experiencing any other symptoms?</i>
Characteristics	<i>Describe the symptom On a scale of 1–10, how severe is your symptom? How often is this symptom present?</i>
History	<i>How long have you had this? Have you experienced this in the past?</i>
Onset	<i>When did it start? What were you doing when it started? Was it a gradual or abrupt onset?</i>
Location	<i>Describe the location of the symptom Is there any radiation from this location?</i>
Aggravating factors	<i>What makes it worse?</i>
Remitting factors	<i>What makes it better? Have you tried anything to treat the symptom?</i>

Additional information gathering such as laboratory test results may be needed for proper assessment. Once the assessment is complete, a quick summary of the data should be presented to the patient. A summary allows the pharmacist to check for accuracy, can help summarize the information, and may be helpful in recognizing additional information that is needed. Finally, ask the patient if there is anything else they would like to add that may have been missed. After the symptom assessment is complete, the pharmacist will be able to create a plan. The plan will be specific to the patient and the symptom and may include a recommendation of pharmacological treatment, a nonpharmacological treatment, or a referral to another health-care practitioner. The recommendation of a drug could be either an OTC product or prescription medication based on the province the pharmacist practices in and its respective scope of practice.

Chronic Disease Assessment

Initial Assessment

Pharmacists have a significant role in the initial assessment of patients who are recently

diagnosed with a chronic disease because most often this diagnosis accompanies the initiation of one or more new medications. A new medication requires a thorough assessment by the pharmacist whether at a community pharmacy or in a hospital. This assessment should begin with the formulation of a complete patient history. The history should include patient demographics, medical history, medication history, social history, and allergies. Although the focus of this section is chronic disease assessment, the following overview of an initial assessment can also be applied to transient illnesses. Patients with acute illnesses, such as an infection or anemia, are also initiated on new medications and require an initial assessment by a pharmacist as well. The pharmacist has a responsibility to ensure that the medication is indicated, effective, and safe and the patient can adhere to the treatment. An acronym that can be used to remember these four parameters of assessment is IESA. For a summary of the IESA steps refer to Table 2.2.

Table 2.2 Summary of the steps of a chronic disease initial assessment

Indication	Determine the reason this new medication was prescribed to the patient Assess if the drug is indicated and if medication therapy is currently warranted
Effective	Assess if the drug prescribed is an optimal treatment choice Determine if the dose of medication is appropriate given the chronic disease Consider patient-specific characteristics (e.g., age, comorbidities) Create a plan to monitor for medication efficacy
Safety	Assess if the dose and frequency of the medication prescribed are appropriate for the indication Determine if a medication is safe for the individual patient given the patient-specific characteristics (e.g., age, comorbidities, allergies) Consider the potential for drug interactions Create a plan to address any safety concerns if present Create a plan for continued monitoring of safety
Adherence	The patient is the main source of information on this topic Pharmacist's role is to help brainstorm options to support patient adherence

Indication

After a new medication is prescribed, the pharmacist should initially assess if the new drug is indicated. It is important to determine the reason this new medication was prescribed to the patient. Based on the medication prescribed an assumption of the disease could be made, but it is also important to ask the patient if he/she knows the indication. Asking the patient may present you with an unexpected indication for the medication, as many drugs are used in multiple diseases. After confirmation of the diagnosis, an assessment of the appropriateness of the drug should be made given the chronic disease. It is often helpful to obtain a history of the present illness, as a more detailed history of what led to the diagnosis can be helpful in the initial assessment as well as follow-up. The pharmacist can then assess if the medication is indicated to treat this disease and if medication therapy is currently warranted.

Effective

After confirming the indication, the next step is to assess if the medication has the potential to be effective. The drug needs to be an appropriate choice for the patient's illness. The pharmacist should assess if the drug prescribed is an optimal treatment choice, which can be determined by evaluating if the medication is a first-line therapy option. Many chronic diseases have published clinical guidelines that provide evidence-based recommendations on first-line therapies for the disease. There are cases in which the patient for various reasons is intentionally not prescribed a first-line therapy, and this should be assessed on a case-by-case basis. If the medication is an appropriate option for the chronic disease, the pharmacist can progress to checking the prescribed dose. For a drug to be effective, usually the dose of the medication should be in a particular dosing range. Keep in mind, however, that the recommended dose of a medication can differ depending on the type and severity of the illness. Also, patient-specific characteristics can impact the dose of the medication, and this should be taken into consideration (discussed in the safety assessment section). Finally, prescribers may choose to titrate a medication up to the recommended dose

to prevent adverse effects at the beginning of therapy; therefore, the original prescribed dose may be lower than the target. At this point, the pharmacist should also consider how efficacy will be monitored after therapy begins. The monitoring plan may include subjective information from the patient, laboratory tests, diagnostic imaging, or a physical examination. The pharmacist should create a plan to monitor for medication efficacy and inquire if there is a follow-up scheduled with the prescriber. If during this part of the initial assessment the pharmacist judges that the medication and/or its dosage regimen is unlikely to be an effective option, then the next step may be to adapt the prescription or contact the prescriber.

Safety

An essential part of the initial assessment is to assess the safety of the newly initiated medication. Ensuring a drug is safe for patients is the responsibility and one of the main roles of the pharmacist. The first step is to assess if the dose and frequency of the medication prescribed are appropriate for the indication as previously discussed. The next step is to determine if a drug is safe for the individual patient given the patient-specific characteristics. Such characteristics include the patient's age, comorbidities, allergies, and medication history. Certain medications need to be used with caution or are contraindicated in specific disease states or when used concomitantly with other drugs and this can be a safety concern. An example of an interaction with a disease is the use of bupropion in patients with a seizure disorder as it can lower the seizure threshold and therefore is not preferable in those patients. The patient's age is important as it can affect the dose or dosing frequency of the medication; for example, a young child will often require a different dose than an adult. Patient comorbidities can also affect the dose, dosing frequency, as well as medication choice. For example, patients with impaired renal function who have been prescribed a drug that is renally eliminated may require dose adjustments. Allergies can be a significant safety concern, and the pharmacist needs to know if a patient has an allergy before dispensing a new medication. In