

Lecture 1: Overview of Institutional Pharmacy & the Role of the Pharmacist Within a Healthcare Setting

1. Describe the overview of our BC Health Care System.

- Ministry of Health; Health Insurance BC; Health Authorities
- **Accreditation Canada:** not-for-profit, independent organization that provides health care organizations with an external peer review process to assess and improve their services based on national standards of excellence.

2. Describe the role of the Ministry of Health, Health Authorities & Health Insurance BC.

| | |
|---------------------|---|
| Ministry of Health | Supports & funds activities of: <ul style="list-style-type: none"> • All regional health authorities • All public health programs and services in BC |
| Health Insurance BC | On behalf of the BC government, administers <ul style="list-style-type: none"> • Medical coverage through the Medical Services Plan • Drug coverage through PharmaCare & Fair PharmaCare programs |
| Health Authorities | Works together with the Ministry of Health to provide high quality, appropriate & timely health services to British Columbians |

3. List the different Health Authorities & the hospitals associated with each Health Authority.

| | | | | | | | | | | | |
|---|--|---|---|---------------------------|---|-------------------------|--|---------------------------|--|------------------------------------|--|
| First Nations Health Authority | | | | | | | | | | | |
| Provincial health services authority (PHSA) | <ul style="list-style-type: none"> • Responsible for governing, managing, planning & coordinating the delivery of provincial programs & specialized health services throughout the province • Works with the 5 Regional Health Authorities <ul style="list-style-type: none"> • BC Cancer Agency • BC Centre for Disease Control • <u>BC Children’s Hospital & Sunny Hill Health Centre for Children</u> • BC Emergency Health Services • BC Mental Health & Addiction Services • BC Renal Agency • BC Transplant • <u>BC Women’s Hospital & Health Centre</u> • Cardiac Services BC • Perinatal Services BC | | | | | | | | | | |
| Regional Health Authorities | <ul style="list-style-type: none"> • Govern, plan & deliver health care services within their geographic areas • Responsible for: <ul style="list-style-type: none"> ○ Identifying population health needs ○ Planning appropriate programs & services ○ Ensuring programs & services are properly funded and managed ○ Meeting performance objectives | | | | | | | | | | |
| | <table border="1"> <tr> <td>Fraser Health Authority</td> <td> <ul style="list-style-type: none"> • Abbotsford Regional Hospital & Cancer Centre • Burnaby Hospital • Chilliwack General Hospital • Eagle Ridge Hospital • Langley Memorial Hospital • Mission Memorial Hospital • Ridge Meadows Hospital • <u>Royal Columbian Hospital</u> • <u>Surrey Memorial Hospital</u> </td> </tr> <tr> <td>Interior Health Authority</td> <td> <ul style="list-style-type: none"> • <u>Kelowna General Hospital</u> • Penticton Regional Hospital • Royal Inland Hospital • 100 Mile District General Hospital • Cariboo Memorial Hospital • East Kootenay Regional Hospital • Kootenay Boundary Regional Hospital • Kootenay Lake Hospital • Shuswap Lake General Hospital • South Okanagan General Hospital • Vernon Jubilee Hospital </td> </tr> <tr> <td>Island Health Authority</td> <td> <ul style="list-style-type: none"> • Nanaimo Regional Hospital • <u>Royal Jubilee Hospital</u> • <u>Victoria General Hospital</u> • Saanich Peninsula Hospital </td> </tr> <tr> <td>Northern Health Authority</td> <td> <ul style="list-style-type: none"> • Prince Rupert Regional Hospital • Fort St. John Hospital • <u>University Hospital of Northern BC</u> • Bulkley Valley District Hospital • Mills Memorial Hospital • St. John Hospital </td> </tr> <tr> <td>Vancouver Coastal Health Authority</td> <td> <ul style="list-style-type: none"> • Mount Saint Joseph Hospital • Richmond Hospital • <u>St. Paul’s Hospital</u> • <u>UBC Hospital</u> • <u>Vancouver General Hospital</u> • <u>Squamish General Hospital</u> </td> </tr> </table> | Fraser Health Authority | <ul style="list-style-type: none"> • Abbotsford Regional Hospital & Cancer Centre • Burnaby Hospital • Chilliwack General Hospital • Eagle Ridge Hospital • Langley Memorial Hospital • Mission Memorial Hospital • Ridge Meadows Hospital • <u>Royal Columbian Hospital</u> • <u>Surrey Memorial Hospital</u> | Interior Health Authority | <ul style="list-style-type: none"> • <u>Kelowna General Hospital</u> • Penticton Regional Hospital • Royal Inland Hospital • 100 Mile District General Hospital • Cariboo Memorial Hospital • East Kootenay Regional Hospital • Kootenay Boundary Regional Hospital • Kootenay Lake Hospital • Shuswap Lake General Hospital • South Okanagan General Hospital • Vernon Jubilee Hospital | Island Health Authority | <ul style="list-style-type: none"> • Nanaimo Regional Hospital • <u>Royal Jubilee Hospital</u> • <u>Victoria General Hospital</u> • Saanich Peninsula Hospital | Northern Health Authority | <ul style="list-style-type: none"> • Prince Rupert Regional Hospital • Fort St. John Hospital • <u>University Hospital of Northern BC</u> • Bulkley Valley District Hospital • Mills Memorial Hospital • St. John Hospital | Vancouver Coastal Health Authority | <ul style="list-style-type: none"> • Mount Saint Joseph Hospital • Richmond Hospital • <u>St. Paul’s Hospital</u> • <u>UBC Hospital</u> • <u>Vancouver General Hospital</u> • <u>Squamish General Hospital</u> |
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4. Define Teaching Hospital & how it differs from Community Hospital.

| Teaching Hospital | Community Hospital |
|---|--|
| <ul style="list-style-type: none"> Usually has an affiliation with a medical school, university, nursing school, or allied health professional training program <ul style="list-style-type: none"> May serve as a research institute Provides clinical education & training for health professionals <ul style="list-style-type: none"> Training is built into the regular delivery of patient care Daily patient care rounds commonly used as opportunities to teach Common for a team of HCPs to care for one patient | <ul style="list-style-type: none"> General hospitals that service the local community |

5. List a few of the Teaching Hospitals in BC.

Underlined in Health Authorities table (LO #3) above.

6. Identify different roles of a pharmacist in an institutional setting.

- Identify & resolve DTPs (main role)
- Presentations, medication teaching & counselling
- Drug monitoring
- Research & projects
- Administration (i.e. committees, advisory groups)
- Lower Mainland Pharmacy Services (LMPS) = Vancouver Coastal Health & Fraser Health Authority (38 hospital pharmacies)

| | | Operational Pharmacy Services | Clinical Pharmacy Services |
|-------------|----------------|--|--|
| Description | | <ol style="list-style-type: none"> In dispensary, pharmacist or technician enters order into computer system Pharmacists checks pt profile & order for DTPs Medication label generated & med sent to ward Patient Med Profile & Medication Administration Record (MAR) generated | On the ward, pharmacist will: <ul style="list-style-type: none"> Liaise with dispensary Work-up pt using "Patient Monitoring Form" Attend patient rounds Be proactive and assist physician in prescribing, identifying & resolving DTPs <ul style="list-style-type: none"> Ideally drug therapy is discussed BEFORE the order is written & sent to pharmacy dispensary |
| Staff | Administration | <ul style="list-style-type: none"> Pharmacy Director Operations Manager Distribution Coordinator & Supervisor | <ul style="list-style-type: none"> Pharmacy Director Clinical Services Manager Clinical Coordinator & Supervisor |
| | Pharmacists | <ul style="list-style-type: none"> Dispensary (BSc) <ul style="list-style-type: none"> 100% in dispensary Clinical (Residency) <ul style="list-style-type: none"> 30-50% of time in dispensary IT/Systems | Acute & Ambulatory: <ul style="list-style-type: none"> Clinical Pharmacy Specialists (PharmD) <ul style="list-style-type: none"> 100% clinical Clinical (Residency) <ul style="list-style-type: none"> 50-70% of time clinical |
| | Technicians | <ul style="list-style-type: none"> Pharmacy Technician | <ul style="list-style-type: none"> Clinical Technician |

7. Identify different members and their roles in a health care team.

| | | |
|---|------------------------------------|---|
| Physicians: diagnosis of medical problem is responsibility of the physician | Attending Physician | <ul style="list-style-type: none"> Has completed a residency and fellowship (usually) Responsible for patient's care |
| | Fellow | <ul style="list-style-type: none"> Completed a specialty training program (residency) and training to become an expert in that field |
| | Resident | <ul style="list-style-type: none"> Training to become specialist physicians |
| | Medical student /clerk | <ul style="list-style-type: none"> Studying to become physicians Need to confirm orders from a resident, fellow, etc |
| | Other physicians (consult service) | <ol style="list-style-type: none"> A patient will be admitted to a primary medical team (usually a general medicine team, aka CTU = clinical teaching unit) Admitting CTU team can request consults from other services (i.e. GI, nephrology, hematology consults) Consult services allow specialized physicians to provide expert opinion for pt's care Recommendations are in the form of "suggests" orders which require written agreement by the primary medical team (admitting CTU) before they are valid Once consulted, the service will follow that specific patient condition Consult team may "sign-off" when the condition-related issue has resolved |

| | | |
|---------------|--|---|
| Nurses | Licensed Practical Nurses (LPN) | <ul style="list-style-type: none"> • 2 year diploma |
| | Registered Nurses (RN) | <ul style="list-style-type: none"> • 4 year degree • Provide direct patient care |
| | Nurse Practitioners (NP) | <ul style="list-style-type: none"> • Master's level • Diagnose conditions and prescribe most medications |
| | Patient Care Nurses | <ul style="list-style-type: none"> • Provide day-to-day patient care • Administers meds & provides patient progress |
| | Unit Clerk | <ul style="list-style-type: none"> • Clerical support for all patient care (i.e. order tests, unit coordination, etc) |
| | Charge Nurse (Pt Care Coordinator) | <ul style="list-style-type: none"> • RN that's responsible for coordinating & supervising nursing services |
| Other | Occupational Therapist, Physiotherapist, Respiratory Therapist, Dietician, Social Worker | |

8. Describe how to communicate with a patient.

- Introduce yourself
- Ask for permission to speak
- Be empathetic
- Simplify information (if possible)
- You can wake up the patient (be polite)

9. Describe how to communicate within a healthcare team.

- Communication with healthcare team:
 - Introduce yourself, establish your role & understand/respect roles of others on the team
 - Be consistent, accurate & precise
 - Provide timely advice & know your facts
 - Ask questions to avoid mistakes
 - Stay open-minded & professional
 - Document all interactions
- Various methods of communication amongst healthcare team: pager, phone (voice or texting), chart note, email
 - Method of communication you choose depends on who you are trying to contact, their availability, and the urgency and complexity of the situation
 - Maintain patient confidentiality, regardless of method of communication used

Lecture 1: Introduction to Healthcare Continuum and Inpatient Information Systems

1. Define continuum of care and understand the components it entails.

- **Continuum of care:** comprehensive array of health services delivered to patients over a period of time
 - Encompasses care (all levels & intensity) provided as an outpatient and/or inpatient
 - Vary for each patient depending on their needs

2. Explain the importance for having awareness of a patient's healthcare continuum.

- Delivery pt-centered care – focus care to activities most valued by patient
- Understanding pt's emotional status during interactions
- Maximizing clinical efficacy & efficiency
- Planning & implementing improvements in healthcare

3. Describe the barriers & considerations involved in movement of patients across their continuum of care.

| | |
|------------------|--|
| Transfer from ER | <ul style="list-style-type: none"> • Clinical status • Speciality admitted under • Bed availability • Type of room requested • Infection control concerns (MRSA, VRE, Tb) |
| Throughout stay | <ul style="list-style-type: none"> • Patient seen daily by: <ul style="list-style-type: none"> ○ Nursing (students + preceptors) ○ Allied health team members (students +/- preceptors) ○ Medical team (students, residents, fellows, attendings) |

| | |
|--------------------|---|
| Discharge planning | <ul style="list-style-type: none"> • LO #4 |
| After discharge | <ul style="list-style-type: none"> • Discharge document dictated by physician <ul style="list-style-type: none"> ○ Sent to family GP/planned follow-up services ○ Stored in pt chart • Pt chart scanned to database or sent down to health records |

4. Describe the process involved in discharge planning of patients from inpatient facilities.

- Estimate length of stay assessed on daily basis (usually through team care rounds)
 - Assess patient progress vs. barriers to discharge (disposition, housing, need for additional support)
- Once deemed medically & functionally stable for discharge:
 - Options discussed with patient
 - Teaching done as required
 - Discharge medication reconciliation done by physicians or pharmacists
 - Prescriptions completed and either given to patient or faxed to regular pharmacy
 - Discharge order written and patient sent home

5. Describe inpatient information systems and their use.

- **Inpatient Information Systems:** comprehensive, integrated information systems designed to manage aspects of a hospital's operations (ex// medical, administrative, financial) which capture, store, and transmit information

6. Differentiate inpatient information systems pertinent to pharmacy practice.

- CareConnect Electronic Health Record
- Excelleris (Pharmanet) System
- Medication Distribution / Management Systems (ex// Centricity, PCIS)
- Clinical Databases (ex// PCIS, Sunrise)
- Automated Dispensing Cabinets (ex// Omnicell, Pyxis)
- Pumps (ex// Alaris Smart Pump, CADD Solis)

7. List the different ways in which pharmacists utilize inpatient information systems.

- Entering and storing medication orders
- Generating reports (ex// MARs, drug profiles, renally cleared therapies)
- Communication (ex// documentation, dictations)
- Accessing clinical outcomes (ex// labs, imaging, diagnostics)
- Medication distribution, delivery, and purchasing
- Medication history & reconciliation

8. Distinguish when and which inpatient information system they need to refer to, in order to gather specific information.

| | Description | Utility |
|--------------------------------|---|---|
| Medication Distribution System | <ul style="list-style-type: none"> • Stores all ordered (active/inactive) medications that pt has been prescribed (via fax or direct orders) | <ul style="list-style-type: none"> • Medication order entry <ul style="list-style-type: none"> ○ Development of MARs • Drug prep/packaging, dispensing & delivery • Production of reports & stats <ul style="list-style-type: none"> ○ Used for research, development & financial planning |
| Clinical Database | <ul style="list-style-type: none"> • Central hub of clinical information from department specific systems <ul style="list-style-type: none"> ○ Lab (ex// electrolytes, blood) ○ Radiology (ex// X-ray, MRI, CT) ○ Pharmacy ○ Dictation/consults ○ Admission history ○ Referrals (ex// social work, physiotherapist, dieticians) | <ul style="list-style-type: none"> • Information gathering for pt-work up • Monitoring • Reports (ex// target drug list, census) • Communication (i.e. assessments, dictations) • Data collection (for research or quality control) |
| Outpatient based system | CareConnect | <ul style="list-style-type: none"> • Lab history from both outpatient and most inpatient facilities across the Lower Mainland • Admission history and some dictated documents |
| | Excelleris Pharmanet | |

Inpatient Information Systems used across BC hospitals:

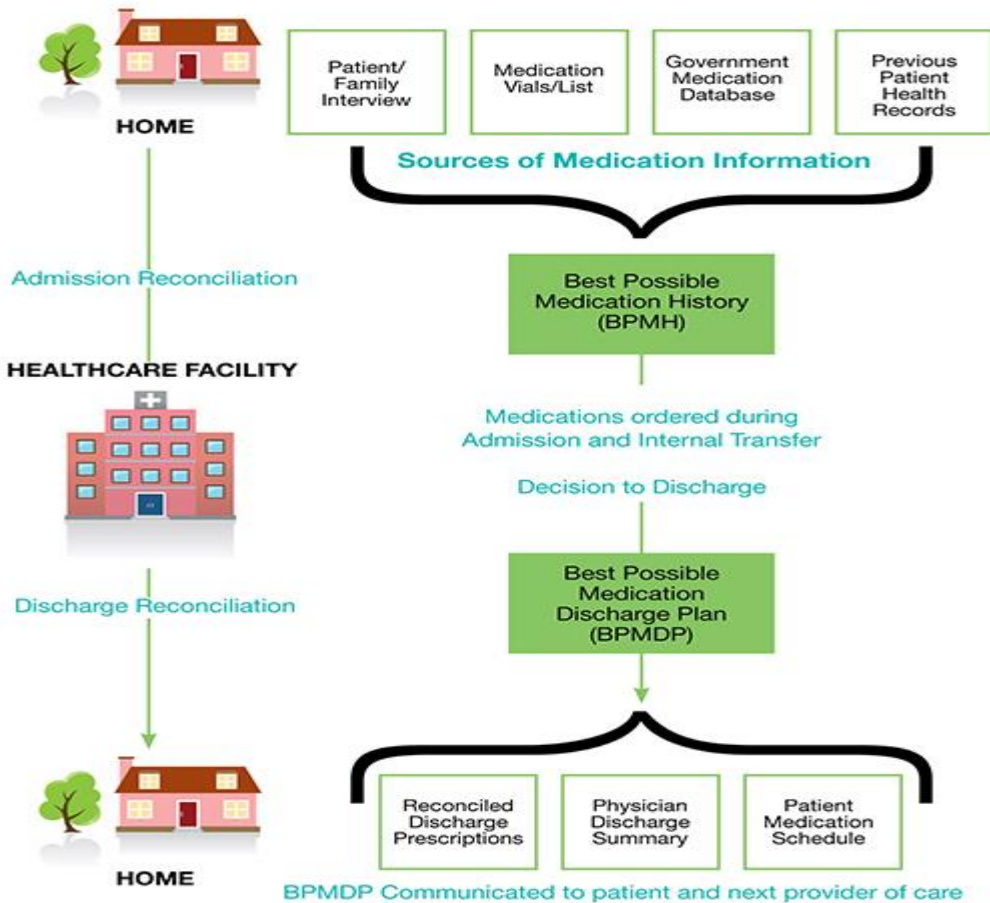
| | | |
|-----------------------------|---------------------------------------|---|
| Hospitals | Medication Distribution System | Clinical |
| VGH, UBCH, Richmond | PCIS | |
| SPH, MSJ, BCCWH | Centricity (BDM) | Sunrise Clinical Manager (SCM) |
| LGH | McKesson STAR (Soon to be: Cerner) | |
| All Fraser Health Hospitals | Meditech | |
| Interior Health | Pharmaflow | Meditech |
| VHA & Northern Health | ScanRx | Cerner |
| | | <ul style="list-style-type: none"> Digital chart displaying pt info in real time Single health record across continuum of care Streamline safety & efficiency of pt care |

Lecture 2: Medication Reconciliation

1. Know the difference between a **Med Rec** BPMH interview and a **Med Review** BPMH interview.
2. Define Medication Rec.

| | Med Review | Med Rec |
|------------------|---|--|
| Use | To provide the pt with a better understanding of meds & products they're currently taking | Systematic process of obtaining an accurate & complete <u>medication history transfer</u> at each interface of care (admission, transfer, discharge) |
| Aims | Educate patient (how, why, holistic view of their medications) | To <i>prevent unintentional</i> discrepancies and <i>document intentional</i> discrepancies (to prevent ADEs) |
| Conducting using | Med Review BPMH | <ul style="list-style-type: none"> Requires systematic pt interview Med Rec BPMH |
| Forms required | MR-S (Standard) | BPMH + BPMH HCP |
| | MR-PC (Pharmacist Consultation) | As above + DTP form |
| | MR-F (Follow-up) | Updated BPMH + BPMH HCP |

3. Describe the process of Med Rec.



4. Know how to conduct a Med Rec BPMH interview using the Med Rec BPMH checklist.
 - Med Rec BPMH: conducted by health provider (Rx, MD, RN)
 - Medication history = patient/caregiver interview AND verification of info with ≥ 1 source (community Rx, Rx vials, Rx lists, MD government med databases (Pharmanet), health records)
5. Given a Med Rec BPMH interview, complete an Admission Med Rec Form.

**If You Received This Facsimile In Error,
Please Call 999-999-9999 Immediately**

Facility Patient Label

Medication Reconciliation Orders
(Page 1 of 2)

Printed on: 2010 Jul 15 14:30

Pathnet, Teresa I
Birthdate: 1955 Jun 2 Gender: F
PHN: BC-9030146737

Medication History Collection (PharmaNet)

Medication History Verification (How patient is taking the medication)

Reconciliation (Actual medication orders)

Order will reflect directions per verification column

Orders will reflect directions per collection column (PharmaNet)

Do not assume the patient is currently taking these medications or in these doses

Request medical interpreter: 604-675-4099

- Signed by Medication History Interviewer & Prescriber Signature (can sign as a V/O)

6. Define Transfer Med Rec and be familiar with a Transfer Med Rec form.
 - Med Rec at changes in level of care or care setting
 - Transfer from sub-acute → acute → critical care (and vice versa)
 - Change in personnel (MD, RN, Rx), beds, group of medications, etc
7. Define Discharge Med Rec and be familiar with a Discharge Med Rec form.
 - Discharge Med Rec: requires multiple comparisons between many different sources (BPMH, hospital meds, unchanged home meds, etc) = more complex process than Admission Med Rec
 - As patient transitions from hospital back to community, the intention is to ensure continuity of drug therapy and prevent medication errors
8. Identify the components of a Best Possible Medication Discharge Plan.

BPMDDP: will have to be rolled out in the next couple of years (accreditation for hospitals)

 - Reconciled Discharge Prescriptions: in hospitals right now
 - Physician Discharge Summary: in process
 - Patient Medication Schedule: some hospitals have it available

Lecture 2: Institutional Drug References & Resources

- Given a clinical scenario, determine the best institutional reference to answer the question that is presented.
- Demonstrate the ability to locate information using the following references:

| | | |
|---|-------------|--|
| American Hospital Formulary Service – Drug Information (AHFS-DI) | Available | Online (UBC library – CWL login) and book |
| | Updated | Yearly by ASHP |
| | Description | Most comprehensive evidence-based info reference complete with therapeutic guidelines, off-label use & citations |
| | Best For | <ul style="list-style-type: none"> Most comprehensive drug information resource Can help with complex dosing, off-label use |
| ClinicalKey | Available | Online (UBC library – CWL login) and mobile app |
| | Updated | MD Consult (old name) has migrated to ClinicalKey |
| | Description | <ul style="list-style-type: none"> Elsevier’s clinical search engine & database to assist clinicians with diagnosis & treatment Referenced primary & tertiary sources and guidelines (more comprehensive than UpToDate) <u>First Consult</u> = review of medical literature on topic by subject matter experts <u>Patient information</u> provided in lay language (printable); multiple languages available |
| | Best for | In-depth diagnostic & treatment information on a clinical topic |
| UpToDate | Available | Online (at most institutions) |
| | Description | <ul style="list-style-type: none"> “Go-to” reference for medical staff & students Wolters Kluwer’s clinical search engine & database to assist with diagnosis & txt Referenced primary & tertiary sources and guidelines (less comprehensive) Drug monographs (from Lexi-Drug) |
| | Best for | In-depth diagnostic & treatment information on a clinical topic |
| Basic Skills in Interpreting Lab Data | Available | Book copy |
| | Description | <ul style="list-style-type: none"> Lab information from a pharmacist’s perspective Reference range reported in US versus SI unit (may need to convert to SI units) |
| | Best for | <ul style="list-style-type: none"> Lab data information and interpretation |
| Handbook of Clinical Drug Data | Available | Book copy |
| | Description | <ul style="list-style-type: none"> Brief drug monographs, drug comparison chart Drugs use in special populations (pregnancy, lactation, pediatric, geriatrics, etc) Information on drug-induced diseases (nephrotoxicity, pancreatitis, etc) |
| | Best For | Drug specific clinical information on special populations & drug-induced diseases |
| The Sanford Guide to Antimicrobial Therapy 2016 | Available | Online & book copy <ul style="list-style-type: none"> Large print & pocket-size versions |
| | Updated | Yearly (US) |
| | Description | <ul style="list-style-type: none"> Use with hospital specific antibiogram if it’s available (because it’s US resistance patterns) Antibiotic spectra (p. 73), abbreviations (p.2) |
| | Best for | All things antimicrobial related |
| Bugs & Drugs | Available | Online & book copy (Canadian) |
| | Description | Sections divided by color: yellow (abx), blue (txt recommendations), orange (prophylaxis recommendations), purple (dental procedures), red (preg/lact), green (organisms) |
| | Best for | All things antimicrobial related |
| Trissel’s Handbook on Injectable Drugs | Available | Book copy |
| | Updated | Every 3 years by ASHP |
| | Description | Provides information on computability, stability, storage & preparation of parenteral drugs |
| | Best for | Parenteral drug questions (should also check info in institution’s Parenteral Drug Therapy Manual) |
| Parenteral Drug Therapy Manual (PDTM) | Available | Online (available at most institutions – site specific PDTM) |
| | Description | <ul style="list-style-type: none"> Parenteral monograph on compatibility, stability, preparation, indications, toxicities, interactions and adverse reactions Ordering restrictions & parenteral administration that are site/ward specific (SC/IM max doses, IV bolus, etc) |
| | Best for | Institutional parenteral policies |

| | | |
|--|-------------|---|
| BC Cancer Agency Website | Available | Online |
| | Description | <ul style="list-style-type: none"> • Cancer drug manual (drug specific) • Cancer drug protocols (protocol specific) • Patient information (can be printed) |
| | Best for | All information that is cancer or chemotherapy related |
| Lexi-Comp Online | Available | Online (at most institutions) |
| | Description | <ul style="list-style-type: none"> • Drug specific & therapeutic information <ul style="list-style-type: none"> ○ Lexi-Drugs & AHFS-DI monographs ○ Lexi-Interact for drug interactions ○ Lexi-Drug ID – medication identification tool ○ IV compatibility – King’s guide information ○ Toxicology & pregnancy/lactation • Patient education available in other languages |
| | Best for | Point-of-care quick searches |
| Micromedex Online | Available | Online (may be available at institutions) |
| | Description | <ul style="list-style-type: none"> • Drug specific & therapeutic information <ul style="list-style-type: none"> ○ Drug monographs ○ Drug interactions ○ Medication identification tool ○ IV compatibility – Trissel’s IV information ○ Toxicology & pregnancy/lactation |
| | Best for | Point-of-care quick searches |
| Drug Prescribing in Renal Failure | Available | Online & book copy |
| | Description | <ul style="list-style-type: none"> • Dose adjustments for renal failure & dialysis patients • Grouped by drug class in adult & pediatric table (alphabetical index, list of abbreviations on p. 16) |
| | Best for | Most comprehensive renal adjustment of drugs (other sources: Lexicomp, Micromedex, CPS, etc) |

3. **Analyze information obtained from different references and make a recommendation.**

How to formulate an effective DIR:

| Desired characteristics | Tips |
|--|---|
| <ul style="list-style-type: none"> • Timely and accurate • Current, complete and concise • Well referenced • Clear and logical • Objective and balanced (free of bias and flaws) • Applicable and appropriate for specific scenario • Answers important related questions | <ul style="list-style-type: none"> • Be objective • Discuss weakness in the evidence • Separate personal opinion from evidence • Create a logical, organized response • Conclusion should follow the evidence • Cite your references • Use a spell checker |

4. **Describe the differences between references and why you would use one reference over another.**

Answered in LO #2

Lecture 3: Navigating Medical Records or Charts

1. **Describe how a patient’s medical records are organized.**

- **Medical Record:** legal document that serves as a communication tool of care provided by the physician and other HCPs
 - Used for planning patient care; can be used for research and education
 - One chart per patient stay, kept on ward or in nursing station (NOT REMOVED except chart goes with pt to procedure or tests)
- **Old records:** when admitted, a request is made for the old records (stored in health records) to be sent to nursing unit
 - For pharmacists, useful for review of therapeutic drug levels & response to therapy, and verification of drug allergies
- **Thinned charts:** if hospital stay is extended & pt’s paper record is too unmanageable → thinned charts
 - For pharmacists, may be useful for old MARs and old pt medication profiles
 - NOTE: original physician orders will remain in chart

- **Electronic Medical Records (EMR):** computer-based pt medical record used by physicians, HCPs & administrative staff
 - Improve pt care by giving physicians better access to clinical information
 - Improve physician office efficiency and workflow
 - Reduce duplicate tests and clinical assessments
 - Enhance pt privacy & confidentiality as defined in legislation and professional practice standards

2. **Extract data from the medical records to understand the care being provided.**

| | |
|--|---|
| Pre-admitting info | <ul style="list-style-type: none"> • Patient identification • Allergy & intolerances (contraindications/cautions) |
| Admitting data | <ul style="list-style-type: none"> • Record of admission (history and screening) • Consent • Interdisciplinary signatures • Verification of family physician |
| Prescriber's Orders (AKA Direct Prescriber's Orders, DPOs) <i>Writing an order:</i> > Date/time > Drug, dose, route, frequency, +/- duration > V/O + dr name, your signature, name, title, contact # | <ul style="list-style-type: none"> • Allergy & intolerances (contraindications/cautions) • Prescriber's Order Form <ul style="list-style-type: none"> ○ <u>Blank orders</u> ○ <u>Pre-printed orders:</u> pre-defined orders assisting prescriber in choosing most appropriate care <ul style="list-style-type: none"> ▪ Built with evidence & best practice; ▪ Often accompanies clinical pathway or practice guidelines ▪ Saves prescriber from potential errors of rewriting ○ <u>STAT orders:</u> needed immediately ○ <u>Post-operative orders:</u> <ul style="list-style-type: none"> ▪ POD 0 = day of operation POD #1 = 1st day after operation ○ <u>Pre-operative orders:</u> <i>considered discontinued after the operation</i> <ul style="list-style-type: none"> ▪ <i>If meds need to be continued after operation, they must be re-ordered</i> ○ <u>Automatic stop date:</u> pre-determined durations of med orders programmed by pharmacy computer to <i>stop unless a specific duration is written</i> (ex// abx stopped after 5 days) • Medication Reconciliation • Pharmacy patient medication profile <p><i>Includes all orders for a patient – not just medications</i></p> <p>> <i>Your task: shift through DPOs to find the <u>medication orders & pertinent info</u></i></p> |
| History | <ul style="list-style-type: none"> • ED record (includes ER nurse assessment) • Medicine Team history sheet • Pharmanet profile |
| Progress Notes | <ul style="list-style-type: none"> • History and patient progress during admission • Consult notes <p><i>Legal documents – must be legible & factually</i></p> <p>→ <i>Name, title of person writing note, date, signature, contact #</i></p> <p>→ <i>May follow standard SOAP or SBAR format</i></p> |
| Medication | <ul style="list-style-type: none"> • Medication Admission Record (MAR) <ul style="list-style-type: none"> ○ Record that lists all medications ordered for a patient <ul style="list-style-type: none"> ▪ Regularly scheduled and PRN meds in a single 24 h period (0000 – 2359 h) ○ Serves as official record of whether patient received scheduled or PRN dose of a med <ul style="list-style-type: none"> ▪ Person administering med circles administration & initials beside it ○ Pharmacists <u>must look at the MAR daily</u> <ul style="list-style-type: none"> ▪ Know the PRNs that have been given the night before ▪ Know the cumulative doses of medications ▪ Know the timing of certain medications (i.e. assessment of drug levels) ○ If a documentation error was made, inform practice educator & prescribing physician if you know the med recommendation has been acted <ul style="list-style-type: none"> ▪ <u>If order not yet processed:</u> <ul style="list-style-type: none"> • Draw a single line through error & initial above (no white out or color through) • Error must be legible & clearly indicated • Date, sign, print name under signature. Indicate who is aware (ex// Dr. Smith aware or RN aware) ▪ <u>If order has been processed:</u> <ul style="list-style-type: none"> • Must write a new order to correct the mistake • NOT acceptable to change previous order (may write “cancel above order for...”) • If medication was administered, an incident report needs to be completed • DO NOT ALTER OR OBLITERATE THE ORIGINAL ENTRY • Pain management flow sheet, blood glucose records, anticoagulation record, etc |

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| Nurses' Notes & graphic charts | <ul style="list-style-type: none"> • Vital signs record • Fluid balance & IV therapy • Nurses' progress notes |
| Interdisciplinary | <ul style="list-style-type: none"> • Interdisciplinary referrals • Collaborative care plans |
| Diagnostics, Labs & Investigations | <ul style="list-style-type: none"> • Lab data (usually in computer system) • Microbiology reports • Diagnostic reports (echo, ECG, etc) |
| Surgery | <ul style="list-style-type: none"> • Surgical report |
| Other | <ul style="list-style-type: none"> • Transcriptions (discharge summary) – <i>may also be in history</i> |

3. **Conduct a patient work-up using the resources provided.**

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| Patient work-up resources | <ul style="list-style-type: none"> • Patient, family, caregivers • Pharmanet profile & patient's medication notes • Community pharmacy • Family physician • Old charts from previous admissions • Provincial lab results | |
| Patient work-up tips | DRUG PROBLEMS (not medical problems) | Your recommendation as a pharmacy student should reflect: <ul style="list-style-type: none"> • The boundaries and scope of your practice • Your role and responsibility as a <u>medication therapy expert</u> • Try not to get stalled over the diagnosis, clinical, or diagnostic procedures |
| | COMMUNICATION IS KEY | Simply reviewing pt medical record DOESN'T guarantee you'll identify all DTPs <ul style="list-style-type: none"> • Communicate with pt or their caregiver <i>and</i> other HCPs involved in pt's care |
| Building Blocks for patient work-up | A – Admission note (CC, HPI, PMH, SHx, etc) E – Electronic medical record (lab, micro, etc) I – Patient Interview O – Other possible sources (past admissions, MAR, nursing notes, etc) U – You should now have most of the information for your work-up | |

4. **Describe and demonstrate an oral patient care presentation to a healthcare provider.**

| Delivery a successful oral report | Common pitfalls in a patient report |
|--|---|
| <ul style="list-style-type: none"> • Be systematic and organized • Look up things you don't know beforehand • Highlight abnormal findings • Prioritize your problem list (acute problems first, then chronic problems) • Make executable recommendations • Always be prepared to answer questions <p>USE THE PT-WORK UP FORM and the ORAL IN-PATIENT PRESENTATION TO PRACTICE EDUCATOR CHECKLIST</p> | <ul style="list-style-type: none"> • Missing or incomplete data • Running out of time • Illogical flow • Failure to prioritize issues • Lack of an executable plan |

Lecture 4: Continuity of Care – Medication Coordination & Medication Safety

1. **Describe hospital formulary system.**

- **BC Health Authority (BCHA) Formulary System:** a list of medications that is available for use in the hospital after being evaluated and selected based on: *most useful therapeutically, most effective dosage forms and cost*
 - Not all drugs are carried in hospital
 - Only 1 brand is carried and may change from time to time (based on quality standards, cost, quantity, dosage forms, packaging, etc)
- Formulary is needed to ensure quality of drug use while controlling cost, and so that all BC pts have access to the same list of drugs regardless of HA's
- BCHA Pharmacy and Therapeutics Committee (medical, pharmacy, nursing) decides on formulary
- Requests for drugs being added to formulary can be submitted to BCHA, but if no apparent advantage over those on the formulary, the drug will not be added

2. Review procedures on using non-formulary drugs, Therapeutic Interchange Policy, patient's own meds & restricted drugs.

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| Non-formulary drugs | How? | <ul style="list-style-type: none"> Substitute to formulary alternative using <u>TIP</u> If TIP unavailable, call MD to switch to formulary alternative If formulary alternative unavailable: <ul style="list-style-type: none"> Use patient's own meds Obtain non-formulary supplies |
| | Why? | <ul style="list-style-type: none"> Ensure rational use of select drugs Decrease drug expenditures Allow interpretation of orders when the strength or dosage form is not indicated or not available |
| Therapeutic Interchange Policy (TIP) | How? | <ul style="list-style-type: none"> Approved by BCHA P&T to pre-authorize pharmacists to "automatically" substitute one drug for another within the same class Prescribers can override by indicating "no substitutions" but must provide adequate rationale |
| | Criteria for using POM | <ul style="list-style-type: none"> Package labelled with patient's name Correct medications inside package Medication not expired (if no expiry date on package, check refill date on label) Medications appear intact and clean Confirm with pt the home storage condition for refrigerated item |
| | Using POM in hospital | <ul style="list-style-type: none"> Label pt's supply with hospital pharmacy label (as per hospital policy) Ensure patient can peel off hospital label on discharge (scotch tape label) Leave expiry date visible, if available |
| Patient's Own Medication (POM) | Administration | <ul style="list-style-type: none"> Patient if bedside medication If not bedside medication, RN administers (kept in Medication Cart) <ul style="list-style-type: none"> Pt can retrieve own supply from RN at time of discharge |
| | Restricted Drugs | <ul style="list-style-type: none"> Concerns with safety, cost, reimbursement, or limited supply Need clinical expertise or additional administration & monitoring Ensure continuity of care or formulation (ex// back-orders) |
| Restricted Drugs | Why? | <ul style="list-style-type: none"> Concerns with safety, cost, reimbursement, or limited supply Need clinical expertise or additional administration & monitoring Ensure continuity of care or formulation (ex// back-orders) |
| | How? | <ul style="list-style-type: none"> Available on formulary but use is restricted based on pre-established criteria: <i>indication, pt population, prescriber (consult speciality), pt location</i> |

3. Review procedures on how to contact Special Access Programme & Pharmacare Special Authority.

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| Special Access Programme | Drugs | Drugs unavailable for sale in Canada |
| | Why? | Emergency access to drugs for treating pts with serious or life-threatening conditions when conventional treatments have failed, are unavailable, or unsuitable |
| | How to contact | <ul style="list-style-type: none"> Prescriber to complete Patient Specific Special Access Request Form (A) and fax to Health Canada SAP and pharmacy For urgent request, follow-up phone call to SAP <ul style="list-style-type: none"> After hrs, follow prompts for a medical emergency and leave a msg Can request for future use in some cases |
| | Prescriber's responsibilities | <ul style="list-style-type: none"> Initiate request to SAP, including supporting evidence (generally <10 yrs old) Ensure pt is well-informed re: drug's benefits vs. risks, development status Agree to provide a report on drug use, including ADRs |
| | Pharmacist's responsibilities | <ul style="list-style-type: none"> Assist with SAP submission Inform prescriber when stock arrives Maintain inventory (max of 6 m for chronic condition) Ensure cost, if any, is pre-approved by pharmacy |
| Pharmacare Special Authority | Drugs | List of SA drugs and eligibility criteria on Pharmacare website |
| | Why? | <ul style="list-style-type: none"> Grants full benefits to a drug otherwise not covered or only partially covered Actual coverage based on pt's individual eligibility and deductible criteria |

4. Describe safe medication practices, including preprinted orders, High-Alert drugs, TALLman Lettering, dangerous abbreviations.

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| Institute for Safe Medication Practices | <ul style="list-style-type: none"> • Non-profit organization based in Philadelphia • Devoted to medication error prevention and safe medication use • Helps healthcare practitioners keep pts safe and leads efforts to improve medication use process | |
| ISMP Canada Vision | <ul style="list-style-type: none"> • Advocate for medication safety through analysis and prevention of medication incidents • Identify risks in systems, recommend safeguards and advance safe medication practices | |
| Pre-printed Prescriber's Orders (PPOs) | Why? | <ul style="list-style-type: none"> • To improve interdisciplinary integration in care • To promote accurate communication • To reduce variation by combining pertinent reminders, safety alerts and best practice • To transform evidence-based knowledge into practice |
| | How? | <ul style="list-style-type: none"> • Prescriber develops the desired preprinted order • Must submit to P&T Committee for approval |
| High-Alert Drugs | Why? | <ul style="list-style-type: none"> • Bear a heightened risk of causing significant pt harm when misused • Consequences of an error with these drugs are more devastating to pts • Encourage safeguards to reduce error risks <ul style="list-style-type: none"> ○ Standardizing orders, storage, prep, administration of drugs ○ Improving access to drug information ○ Limiting access to high alert drugs ○ Using auxiliary labels and automated alerts ○ Employing redundancies (double-checks) |
| TALLman Lettering | <ul style="list-style-type: none"> • Bolded tall man (uppercase) letters to help draw attention to the dissimilarities in <i>look-alike drugs</i> <ul style="list-style-type: none"> ○ Example: aMILoride (confused with amlodipine) ○ Example: CARBOplatin (confused with CISplatin) | |
| Automatic Stop Date | <ul style="list-style-type: none"> • Medication orders not stating the number of doses or days are automatically stopped <ul style="list-style-type: none"> ○ Example: anti-infectives at 7 days • All pre-op orders are discontinued and new orders must be re-written post-op | |
| Dangerous abbreviations | <ul style="list-style-type: none"> • ISMP Canada, Accreditation Canada, and the Canadian Patient Safety Institute work to eliminate the use of: <ul style="list-style-type: none"> ○ Dangerous abbreviations (U, IU, QD/QOD, OD, OS/OD/OU, D/C, cc, ug, abbreviations of drug names) ○ Dangerous symbols (@, >, <) ○ Dangerous dose designations (trailing zeros or lack of leading zero) | |

5. Review safe medication order writing.

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| Core medication order components | <ul style="list-style-type: none"> • Patient name & ID: 2 unique identifiers (use an addressograph) • Date & time of order • Medication name – unabbreviated, generic name except for combination products • Dose (route & frequency) – use approved abbreviations, formats and units • PRN with additional dosing criteria – max dose, frequency, clinical criteria • Legible prescriber ID – signature, printed name & college ID |
| Additional safety elements of order writing | <ul style="list-style-type: none"> • Therapeutic indication • Duration of therapy • Clearly write ranges or sliding scale (with dosing increments related to pt clinical criteria) • Dosage form, if unusual or multiples • Specific “hold” duration • Avoid “suggest” or “if acceptable” orders |
| Verbal or phone orders | <ul style="list-style-type: none"> • Neither is accepted as safe practice, but allowable in “emergent care” such as life threatening situation or during surgery • If done: <ul style="list-style-type: none"> ○ Original prescriber must directly orally transmit the order to a qualified practitioner ○ 1st qualified practitioner must repeat order to original prescriber & immediately write order <ul style="list-style-type: none"> ▪ 2nd qualified practitioner (if available) will overhear and countersign the order ○ Original prescriber <u>should</u> countersign order within 24 hrs |

6. **Review Patient Safety Learning System (PSLS) reporting.**

- BC PSLs: provincial system for all healthcare providers and recipients across health authorities and care settings
 - Web-based adverse event reporting tool to improve pt safety and quality: *captures safety events, facilitates learning, enables system change*
- Safety events include near misses and span beyond medications
 - Pharmacists most likely to be involved with medication-related incidents

Lecture 5 – Documentation Standards & Practices

1. **Explain the role and importance of written documentation by pharmacists.**

- Improves patient care & safety: serves as a record of pt’s “health care story,” including patient data, patient progress, and clinical reasoning (what a HCP does, why it is done & what outcomes are achieved)
- Enables efficient communication & continuity of care: assists next member of the healthcare team to provide better quality care = shared responsibility and collaboration
- Conveys professionalism: Health Professions Act requires a written record of clinical activities; also demonstrates pharmacist’s roles and contributions
- Establishes accountability & responsibility: serves as a legal permanent health record; protects against professional liability

2. **Summarize the types of activities and services that should be documented by a pharmacist as detailed in the Hospital Pharmacy Standards of Practice.**

- Actual or potential drug-related problems that warrant monitoring
- Recommendations for changes in drug selection, dosage, duration of therapy, and route of administration
- Recommendations for monitoring the response to drug therapy
- Notations of consultations provided to other HCPs about the patient’s drug therapy selection and management
- Notations of drug-related patient education and/or consultation provided
- Clarification of drug orders and practitioner’s telephone orders received directly by the registrant
- Allergies, adverse drug reactions and intolerances

3. **List the essential components of a good clinical note.**

- Includes vital components: time and date; note title; patient ID; name of pharmacist & contact info
- Uses only standard terminology: avoids ISMP error-prone abbreviations; uses Tall Man Lettering
- Is organized, prioritized & realistic: uses bullet points rather than sentences
- Things to avoid:
 - Judgmental, offensive, argumentative language
 - Altering or deleting a previous note – use an addendum note instead
 - Inappropriate editing (no white-out) – instead, cross out errors with a single line, label “error” and initial
 - Leaving blank space or lines
- Tips for success:
 - Re-read your note to ensure it is complete and accurate (read it backwards!)
 - Avoid extraneous information – document what is important and stay focused (concise but thorough)
 - Needs to be clear, realistic, timely and legible

4. **Define the different formats of documentation seen within clinical practice including, but not limited to, SOAP, SBAR, DDAP and FARM.**

| SOAP | FARM | SBAR | DDAP |
|------------|-----------------|----------------|------------|
| Subjective | Findings | Situation | DTP |
| Objective | Assessment | Background | Data |
| Assessment | Recommendations | Assessment | Assessment |
| Plan | Monitoring | Recommendation | Plan |

Locations of pharmacist documentation:

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| Pharmacy records | <ul style="list-style-type: none"> Primarily for the pharmacist’s reference Ex// local pharmacy computer records, Patient Monitoring Form |
| Medical charts or health records | <ul style="list-style-type: none"> Vehicle used by all health care providers to document their assessment and plan Can be electronic or written (or combo) Ex// consult notes or progress notes (pharmacist documentation can occur in different parts of the chart depending on site/health authority) |

Lecture 5 – Allergy Assessments

1. **Understand and explain the underlying goals/purpose behind conducting an allergy assessment and differentiating allergic reactions from adverse drug reactions.**

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| Purpose | <ul style="list-style-type: none"> To prevent life-threatening reactions To clarify between ADRs, SEs and different types of allergies to help guide therapy based on clear, fully elucidates benefits and risks To educate patients and clarify documentation To increase healthcare system efficiency |
| Sources of confusion | <ul style="list-style-type: none"> Limited history: poor memory; lack of detail (reaction, dates, timeline); 2nd-hand info (parents) Suspicion of allergy (parents are allergic, so I must be too) Confusion between ADR/SE vs. allergies |

2. **To accurately document and retrieve allergy information in an inpatient setting using either a “Caution” sheet or the “Allergy Assessment” form based on the information ascertained during a patient interview.**

- Ask each patient about their drug allergy history:
 - Nature of allergic reaction (S/S)
 - Product that caused the reaction
 - Timing of the reaction (<24 h, 24-72h, or >72h)
- Document response on allergy assessment form
 - Different healthcare facilities/sites use different forms – the way info is captured in orders/charts may differ
 - (Look at forms from lecture – difference b/w Providence & Vancouver Coastal Health)
 - If any information cannot be obtained, write “unknown”
 - Describe any interventions
- Educate the patient (allergic vs. ADR vs. intolerance)

Lecture 5 – Medication Counselling

Medication Counselling:

- Can encompass a wide range of consultations with patient
- Resources: use forms to help you prepare & practice (site specific counselling forms; OEE counselling check lists)
- Needs to be documented

Successful Counselling:

- Practice
- Avoid information overload; provide resources
- Employ active teaching principles (ex// demonstration)
- Check for understanding; listen; employ empathy

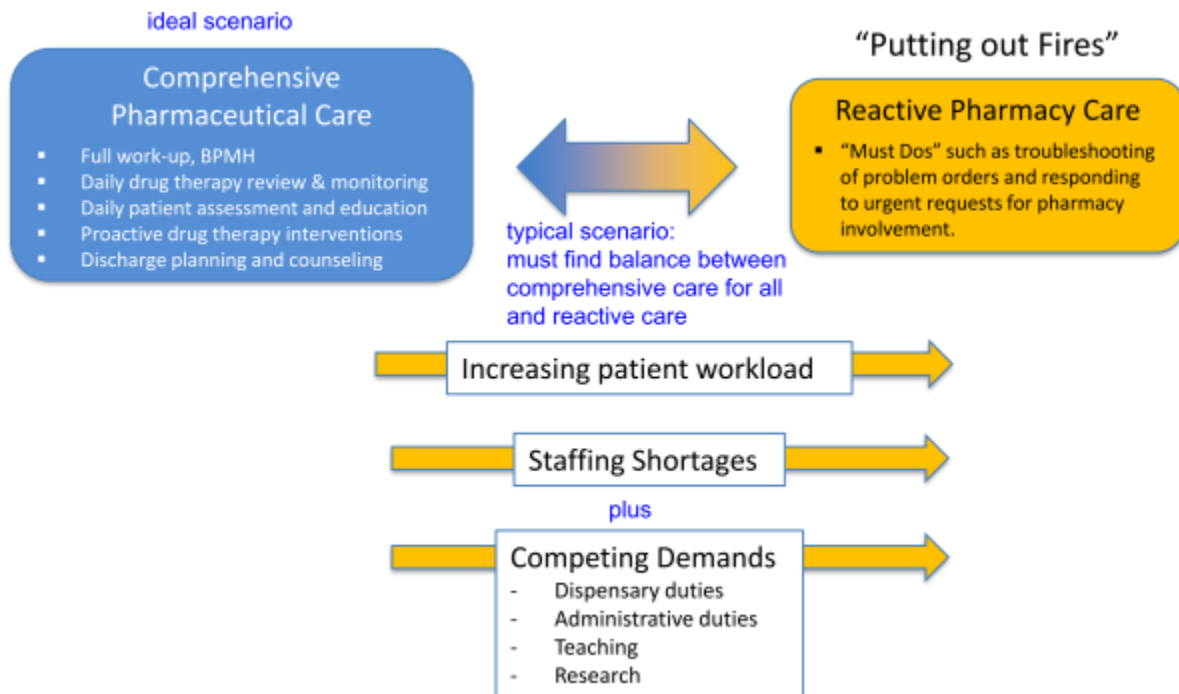
Lecture 6 – Inpatient Clinical Pharmacy

Hospital pharmacy services in BC

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| Dispensary services | <ul style="list-style-type: none"> • Most basic or core function • Safely supply parenteral and oral medications to patients |
| Direct patient care (clinical) | <ul style="list-style-type: none"> • Pharmacists provide pharmaceutical care to patients and interact directly with patients and the healthcare team • Quantity & type of clinical pharmacy services provided varies <ul style="list-style-type: none"> ○ <i>Resource and staffing constraints</i> = main limiting factor ○ Academic Teaching Hospital vs. Community Hospital or Rural Hospital ○ Type of care setting (acuity of pts – critical/acute/residential care; type of ward) |

1. Describe how a clinical pharmacist in the hospital setting prioritizes patient care.

- Goal: to provide the most impactful pharmacy care possible within the context of the time & resources available



- Strategies to prioritize care:

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| Must-Dos | <ul style="list-style-type: none"> • Troubleshoot orders (LO #2) • Responding to urgent requests for pharmacy involvement (pts, nurses, medical team) <ul style="list-style-type: none"> ○ Special authority; inhaler counseling; assist nurse on non-formulary IV meds • May be able to prioritize, but need to discuss/negotiate with requestor • Targeted services may be considered “must dos” as well |
| Clinical Pharmacist Identified Issues (methods to identify potential & actual DTPs) | Identified via: <ul style="list-style-type: none"> • Daily Medication Profile Review (all pts) • Patient Chart/Health Record Review (most pts) • Patient Interview (selected pts) • Comprehensive care (selected pts) |
| Targeted Clinical Pharmacy Services | LO #4-8 |
| Reports & Tools to Help Identify DTPs | LO #2-3 |

2. Identify the common reasons that medication orders may be referred to a clinical pharmacist for clarification or resolution (troubleshooting).

- Orders flagged by the dispensary that require involvement/resolution by the clinical pharmacist
 - Non-formulary medications
 - Unclear orders
 - Orders that require clinical pharmacist follow-up (ex// adjust vancomycin dosing)
- High priority because pt may not receive a required medication until a pharmacist assesses therapy or resolves this issue

3. Describe the types of drugs that you might see on a computer-generated target drugs report.

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| Target Drug List | Description | <ul style="list-style-type: none"> • Computer-generated list of medications that should be assessed by a pharmacist |
| | May include | <ul style="list-style-type: none"> • Broad spectrum antibiotics • High risk drugs (warfarin, digoxin, others) • Drugs that require therapeutic monitoring (phenytoin, carbamazepine, vancomycin, aminoglycosides, tacrolimus) • High cost medications • IV medications that may need to be stepped down to oral alternatives (PPIs, abxs) • May include non-formulary medications as “medication not available” |
| Specialized Report | Description | <ul style="list-style-type: none"> • Computer-generated reports that combine drug, lab and other data to make it easier to spot drug therapy problems |
| | Examples | <ul style="list-style-type: none"> • Renal dosing reports • Drug levels report • Positive C. difficile toxin report • Warfarin & INRs |

4. Explain the rationale for “targeted pharmacy services.”

- Intended to provide a consistent approach and reliable service in regards to some specific high priority drug therapy issues
 - Pharmacists are uniquely equipped to provide the service (assess and resolve the DTP)
 - All patients with the target DTP in question will receive a similar approach/level of service by pharmacy

5. List at least three examples of targeted pharmacy services.

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| Drug Measurement Service <i>aka PK Service; Therapeutic Drug Monitoring</i> | Description | <ul style="list-style-type: none"> • AKA Pharmacokinetic Service; Therapeutic Drug Monitoring • Pharmacists will review all medications that may require PK monitoring and assess whether drug levels are necessary • Pharmacists will provide an interpretation & recommendation for all reported drug levels (chart note & order) |
| | Tools | <ul style="list-style-type: none"> • Automated DMS Clinical Report (target drugs report) flags patients receiving drugs that may require PK monitoring • DMS Drug Levels Report identifies all levels that have been run |
| | Authority | <ul style="list-style-type: none"> • Pharmacists have the authority to independently order drug levels and change the dose and/or interval of medications in response to a reported drug level |
| Renal Dosing Service | Description | <ul style="list-style-type: none"> • Pharmacists will appropriately adjust the dose and/or frequency of dosing of medications that are renally eliminated for all patients with an eGFR <50 mL/min and appropriately document the change |
| | Tools | <ul style="list-style-type: none"> • Automated Renal Failure Medications report flags pts & drugs that meet the above criteria • Pharmacists use recommended references to determine appropriate dosing based <ul style="list-style-type: none"> ○ Drug Prescribing in Renal Failure (Bennett’s) ○ Drug databases (Lexi-comp; Micromedex) ○ Local guidelines (from hospital) • eGFR vs. CrCl <ul style="list-style-type: none"> ○ eGFR: lab-calculated; reported along with creatinine; no manual calculations ○ CrCl: calculated by hand; most drug-dosing tables based on CrCl |
| | Authority | <ul style="list-style-type: none"> • Pharmacists have the authority to independently change the dose and/or interval of medications to account for renal function |

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| Antimicrobial Stewardship | • LO #7 |
| IV to PO stepdown service | • LO #8 |
| Warfarin Dosing service | |

6. Describe the key considerations related to the renal dose adjustment of medications.

- Are the medications indicated?
- Is the renal function changing?
 - What is the baseline (pt's usual) renal function? Is it worsening/improving? Reversibility?
- Is a dose adjustment necessary?
 - Check renal dosing reference
 - Clinical considerations: risks of under-dosing? Risks of accumulation?

7. Describe how clinical pharmacists contribute to antimicrobial stewardship efforts.

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| Definition | <ul style="list-style-type: none"> • “Antimicrobial stewardship is the practice of minimizing the emergence of antimicrobial resistance by using antibiotics <i>only when necessary</i>, and if needed, by selecting the <i>appropriate antibiotic at the right dose, frequency, and duration</i> to optimize outcomes while minimizing adverse effects.” • Cost savings is also important |
| Formal antimicrobial stewardship | <ul style="list-style-type: none"> • Exists at many hospitals → stewardship is EVERYONE'S JOB • Antimicrobial Stewardship Pharmacist and/or Medical Microbiologist <ul style="list-style-type: none"> ○ Audit & feedback; antibiotic policies & restrictions; education |
| Clinical pharmacists contribute to antimicrobial stewardship | <ul style="list-style-type: none"> • Recommend antimicrobials with the <i>narrowest spectrum of activity</i> possible <ul style="list-style-type: none"> ○ Based on the organisms most likely to cause the infection or based on culture and susceptibility data • <i>Stopping antimicrobials</i> when they are either not indicated or when an adequate course of therapy has been completed • <i>Stepping antimicrobials</i> down from IV to PO route at earliest feasible opportunity |
| Local antibiogram | <ul style="list-style-type: none"> • = a periodic summary of antimicrobial susceptibilities of local bacterial isolates submitted to the hospital's clinical microbiology laboratory <ul style="list-style-type: none"> ○ Help clinicians choose empiric antimicrobial therapy ○ Provide guidance on narrowing antibiotic spectrum based on specific organism isolated ○ Allows tracking of susceptibility trends and patterns |

8. Recognize scenarios where intravenous (IV) to oral (PO) stepdown is (or is not) appropriate.

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| Why are parenteral medications needed? | <ul style="list-style-type: none"> • Certain broad spectrum antibiotics/other medications not available in oral forms • Immediate systemic effect (100% bioavailable) to achieve maximum tissue concentrations • May not be able to swallow or absorb via enteral route |
| Downside of parenteral medications | <ul style="list-style-type: none"> • Invasive – requires an IV line or an injection (SC, IM) • Risk of infection and complications (ex// thrombosis) • Patient comfort and mobility • May delay discharge • Cost – IV medications typically more costly than oral |
| Stepdown considerations | <ul style="list-style-type: none"> • Is there an oral alternative? • Is the patient able to take/absorb oral medication? • Does the oral medication have high oral bioavailability? • Is the patient clinically improved/stable enough to allow a switch to oral medication? • Is it recommended that the condition be treated with oral therapy? • If it is an antibiotic, is there an opportunity to narrow the spectrum of activity? |
| Appropriate IV stepdown | <ul style="list-style-type: none"> • High bioavailability and oral form exists (ex// moxi/cipro-floxacin; clindamycin) • Oral dose = (or almost equal to) IV dose |
| Inappropriate stepdown | <ul style="list-style-type: none"> • Deep-seated infections (ex// endocarditis, osteomyelitis, septic arthritis, meningitis, abscesses) |

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| VCH – acute guidelines | Criteria | <ul style="list-style-type: none"> • Continue to need medication • Clinically stable • Capable of tolerating oral dosage form • No factors (GI abnormalities; drug interactions) that would adversely affect oral bioavailability | |
| | Group 1 drugs | Pharmacist may step-down independently w/ appropriate documentation | <ul style="list-style-type: none"> • Drugs have similar AUC achieved with oral dosage form of same drug • Ciprofloxacin; clindamycin; cotrimoxazole; fluconazole; linezolid; moxifloxacin; metronidazole; voriconazole |
| | Group 2 drugs | | <ul style="list-style-type: none"> • Lower AUC achieved with oral dosage form of same drug • Pt must be clinically improving prior to step-down • Acyclovir → valaciclovir; ampicillin → amoxicillin; azithromycin → azithro/clarithro-mycin; cefazolin → cephalexin; cefuroxime → cefuroxime axetil → Pen G → Pen V |
| | Group 3 drugs | Pharmacist must discuss with team before stepping down | <ul style="list-style-type: none"> • No oral alternative available • Drug selection based on pathogen susceptibility and no contraindications to therapeutic alternative |