An Evaluation of the Interventions of Clinical Pharmacists’ at University Hospital of the West Indies

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OBJECTIVES

- Provide an overview of clinical pharmacy services
- Discuss the role of the clinical pharmacist
- Increase awareness of the role of the clinical pharmacist
- Identify and categorize drug related problems
- Provide recommendation/solutions to DRP’s
- To access the pharmacoeconomic impact of the drug related problem
Clinical Pharmacy

- Defined by the American College of Clinical Pharmacy (ACCP) as a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, wellness, and disease prevention.

- Contributes directly to patient care and develops and promotes the rational and appropriate use of medicinal products.
Basic components of clinical pharmacy practice:

- Administering drugs
- Documenting professional services
- Reviewing drug use
- Communication
- Counseling
- Consulting
- Preventing Medication Errors
Scope of Clinical Pharmacy:

- Drug Information
- Drug Utilization
- Drug Evaluation and Selection
- Medication Therapy Management
- Disease State Management
Clinical Pharmacy Tools

- Medication reconciliation
  - The process of identifying the most accurate list of a patient’s current drugs and comparing that with the current list in use, recognizing any discrepancies, and documenting any changes

- Medication review
  - Lowe et al. define the concept of medication review as: “the process where a health professional reviews the patient, the illnesses and the drug treatment during a consultation"
Development of Clinical Pharmacy

- Evolved over time with increased emphasis on collaborative care and patient interaction.
- It differs from that of traditional pharmacists in that they work directly with providers and patients to provide services not simply associated with dispensing of drugs.
- Clinical pharmacy practice was introduced at UHWI in 1997 through rounding with medical doctors where the pharmacist interfaces with the primary care team, monitors patient progress, reviews medication, conducts discharge counseling and provides advice on drug therapy.
Role of the clinical pharmacist

This is achieved through verification of:

- Appropriateness of medications in the proposed treatment plan
- Monitoring implementation of treatment
- Checking for safety and effectiveness and
- Confirmation that medication is producing the desired effects.
Role of the clinical pharmacist

- Patient medication history interview
- Medication order review
- Patient counseling regarding safe and rational use of drug
- Adverse drug reaction monitoring
- Drug interaction monitoring
- Therapeutic drug monitoring
- Participating in ward rounds and providing drug information
DRUG RELATED PROBLEMS (DRP’S)

- The core functions of clinical pharmacy service are the detection, resolution and prevention of drug related problems (DRP’s) to ensure safe and effective medicine use.

- A DRP can be defined as any event or circumstance involving a patient’s drug therapy that interferes or potentially interferes with achieving optimal therapeutic outcome.

- It may result in reduced quality of life, morbidity or mortality.
DRP’S

- They include and are not limited to medication errors (errors in the process of prescribing, dispensing or administering a drug) and adverse drug reactions.

- Drug related problems *may* arise at all stages of the medication process from prescription to follow-up of treatment.

- Most problems are centered on administration, dispensing and the patients use of a medicinal product, but lack of follow-up and reassessment of medical treatment is also a major problem.
In 1990, Linda Strand wrote: "A Drug Related Problem (DRP) exists when a patient experiences or is likely to experience either a disease or symptom having an actual or suspected relationship with drug therapy" (1).

Strand also categorised DRPs in a list that has been extensively used worldwide, especially among pharmacists.
The eight categories are:

(The patient has a medical condition)

1. that requires drug therapy (a drug indication) but is not receiving a drug for that indication. This category addresses under prescribing.

2. which the wrong drug is being taken. Here, the notion of “wrong drug” includes drugs that are contraindicated, unnecessarily expensive or ineffective.
3. for which too little of the correct drug is being taken.
4. for which too much of the correct drug is being taken.
5. resulting from an adverse drug reaction (ADR).
6. resulting from a drug-drug, drug-food or drug-laboratory interaction.
7. that is the result of not receiving the prescribed drug. There can be a number of reasons for this problem – within or outside of patients’ control – such as noncompliance, poverty or administration failure.
8. that is the result of taking a drug for which there is no valid medical indication. Unnecessary drug use tends to be far too often overlooked as a DRP category.
INTERVENTIONS

- Intervention is defined as an action by a clinical pharmacist, which results in a change in the patient’s therapeutic management.
- Intervention outcomes include economics, health-related quality of life, patient satisfaction, medication appropriateness, adverse drug events (ADEs), and adverse drug reactions (ADRs).
- An ADE is defined as “an injury resulting from medical intervention related to a drug,” and an ADR is defined as “an effect that is noxious and unintended and which occurs at doses used in man for prophylaxis, diagnosis, or therapy.”
Mini study at UWHI

- The UHWI hospital is a teaching hospital with a capacity of over 500 beds approximately 400 physicians and 20 pharmacists two of them being involved in the provision of clinical pharmacy services during ward round participation and other ward based activities.

- The aim of this study was to perform a comprehensive evaluation of the clinical pharmacist interventions at UWHI.
METHODOLOGY

- The study was designed as a prospective 16-week observation and descriptive clinical pharmacists’ intervention study on the medical floor of the University Hospital of the West Indies.
- The pharmacist designed a standard format to collect relevant data for each intervention such as details of patient, current medications, problem identified and physician’s response.
- The patients' demographic data (age and gender), current medication (drug, dose, route and frequency), past medical and medication history (allergies) were collected and recorded.
- All patients assigned to specialties were reviewed and once a DRP was identified a recommendation was made to the attending physician.
- The main outcomes measured were the type and frequency of DRP’S, the type and frequency of clinical pharmacists' interventions and contributions, and the physicians' acceptance rate.
Clinical pharmacy process

1. Detection of actual or potential DRP
2. Clinical pharmacist intervention
3. Outcome of intervention
4. Documentation of intervention and outcome
Results

- During 60 ward rounds (20 in cardiology (C), 23 in General medicine (GM) and 17 in nephrology (N))
- 368 patients were admitted to the specialties (94 in C, 140 in GM and 134 in N) of which 112 patients contributed to 135 DRP’S (29 in C, 80 in GM and 26 in N) which were identified and addressed.

- Discordance between the actual and theoretical number of ward rounds according to study duration and frequency of participation was due to absence of the clinical pharmacist or a ward round at the scheduled time
Overview of specialties with regular clinical pharmacy services

<table>
<thead>
<tr>
<th>Specialty/Discipline</th>
<th>Ward Round per week</th>
<th>Ward Round Hours per day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiology</td>
<td>2</td>
<td>2-3</td>
</tr>
<tr>
<td>Nephrology</td>
<td>2</td>
<td>2-3</td>
</tr>
<tr>
<td>General Medicine</td>
<td>2</td>
<td>2-3</td>
</tr>
</tbody>
</table>
Chart representing the # of patients per Specialty

- General Medicine: 66%
- Cardiology: 20%
- Nephrology: 14%

0%
Age of study population

- 81-100: 13% (14)
- 61-80: 24% (27)
- 41-60: 40% (45)
- 21-40: 21% (24)
- 15-20: 1% (2)
Results

- The most common DRPs were related to Prescribing events (86%), administration events (12%) and adverse events (2%).
<table>
<thead>
<tr>
<th>Types of DRPs</th>
<th>No. of DRPs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Adverse Drug Reactions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Allergic reaction</td>
<td>00</td>
<td>04</td>
</tr>
<tr>
<td>b) Side effect</td>
<td>04</td>
<td>04</td>
</tr>
<tr>
<td><strong>Interactions</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Drug – Drug interaction</td>
<td>01</td>
<td>01</td>
</tr>
<tr>
<td>b) Drug disease interaction</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>c) Drug food interaction</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td><strong>Drug Selection</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Drug needed not prescribed</td>
<td>23</td>
<td>38</td>
</tr>
<tr>
<td>b) Drug prescribed not needed</td>
<td>05</td>
<td>05</td>
</tr>
<tr>
<td>c) Drug duplication</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>d) Cost of therapy</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>e) Contraindication</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td>f) Inappropriate dosage form</td>
<td>00</td>
<td>00</td>
</tr>
<tr>
<td><strong>Dosing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Dose too low</td>
<td>09</td>
<td>09</td>
</tr>
<tr>
<td>b) Dose too high</td>
<td>21</td>
<td>21</td>
</tr>
<tr>
<td>c) Duration inappropriate</td>
<td>02</td>
<td>02</td>
</tr>
</tbody>
</table>
## Types of Drug Related Problems

<table>
<thead>
<tr>
<th>Types of DRPs</th>
<th>No. of DRPs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drug Use</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Wrong dose taken/administered</td>
<td>00</td>
<td>10 (9%)</td>
</tr>
<tr>
<td>b) Wrong drug taken/administered</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>c) Drug not taken</td>
<td>07</td>
<td></td>
</tr>
<tr>
<td>d) Incorrect Storage</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>e) Incorrect Administration</td>
<td>03</td>
<td></td>
</tr>
<tr>
<td><strong>Untreated Indications</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Condition not adequately treated</td>
<td>14</td>
<td>14 (12%)</td>
</tr>
<tr>
<td>b) Preventative therapy required</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td><strong>Patient or Provider</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Demonstration of devise</td>
<td>00</td>
<td>3 (3%)</td>
</tr>
<tr>
<td>b) Patient didn’t understand instruction</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>c) Patient misuse (overuse/underuse)</td>
<td>00</td>
<td></td>
</tr>
<tr>
<td>d) Non-Adherence</td>
<td>03</td>
<td></td>
</tr>
</tbody>
</table>
Results

- The most frequent clinical pharmacists’ interventions and contributions were related to drug choice (33%) and dosing (28%).
## Type and frequency of drug-related problems, per clinical area

<table>
<thead>
<tr>
<th>Type of DRP</th>
<th>Cardiology N (%)</th>
<th>General Medicine N (%)</th>
<th>Nephrology N(%)</th>
<th>Total N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adverse Drug Reaction</td>
<td>---</td>
<td>2(2)</td>
<td>2 (2)</td>
<td>4(3.5)</td>
</tr>
<tr>
<td>Interaction</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Drug selection</td>
<td>6(5)</td>
<td>38(33)</td>
<td>5(4)</td>
<td>49(43)</td>
</tr>
<tr>
<td>Dosing</td>
<td>11(10)</td>
<td>20(18)</td>
<td>6(5)</td>
<td>37(32)</td>
</tr>
<tr>
<td>Drug Use</td>
<td>3(3)</td>
<td>5(4)</td>
<td>5(4)</td>
<td>13(11)</td>
</tr>
<tr>
<td>Untreated Condition</td>
<td>1(1)</td>
<td>6(5)</td>
<td>4(3.5)</td>
<td>11(10)</td>
</tr>
</tbody>
</table>
## Clinical Pharmacist Recommendations

<table>
<thead>
<tr>
<th>Types of Recommendations</th>
<th>Number</th>
<th>Total (n=94)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drug Choice</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Drug discontinuation</td>
<td>17</td>
<td>53 (56%)</td>
</tr>
<tr>
<td>b) Addition of a new drug</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>c) Change of dosage form</td>
<td>53</td>
<td></td>
</tr>
<tr>
<td><strong>Dosing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Decrease the dose</td>
<td>19</td>
<td>31 (33%)</td>
</tr>
<tr>
<td>b) Increase the dose</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>c) Appropriate regimen</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td><strong>Optimization of administration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a) Change of administration route</td>
<td>07</td>
<td>17 (18%)</td>
</tr>
<tr>
<td>b) Administration modalities</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>Advise to patients</strong></td>
<td>03</td>
<td>3 (3%)</td>
</tr>
</tbody>
</table>
Outcome of Clinical Pharmacist Recommendation

- Accepted: 97 (72%)
- Considered: 21 (16%)
- Rejected: 17 (13%)
Results

- For 72% (n=135) of the interventions, an acceptance rate was recorded while 16% of the interventions were being considered and 13% was rejected.
- This is a little below published acceptance rates which is at an average of 85.5% (11).
- Factors affecting acceptance included time, communication, solicited versus unsolicited recommendations, type of prescriber, and type of pharmacist.
- Factors leading to non-acceptance included quality of suggestions, prescribers' exercise of caution with respect to patient safety and well-being, and negative attitude toward clinical pharmacy.
Most affected drug class

- Antibiotics, proton pump inhibitors, ACE inhibitors, statins and NSAIDs were involved in the majority of DRPs
Limitations

- The frequency and continuity of ward round participation overall was low.
- Small sample size and short duration
- No control arm to study (RCT), difficult to access statistical significance.
Recommendation

- Increase ward rounds as twice weekly ward attendance, for example, complicates the follow up of addressed DRPs, suggested interventions and patient outcomes and the overall multidisciplinary team work.
- Follow up study to access pharmacoecomics
Conclusion

- The study suggests a valuable contribution of the clinical pharmacist to multidisciplinary patient care during ward rounds by addressing DRPs, performing interventions and providing information.
- DRPs are highly prevalent in hospitalized patients (30%)
- Optimization of drug therapy by preventing DRPs positively influences costs, reduces mortality and improves patients’ quality of life.
- Evidence regarding clinical pharmacy services is published for several patient groups and clinical settings.
The study showed that the Clinical pharmacist interventions in drug therapy helped clinicians in identifying and preventing drug related problems.

Other studies have shown that a clinical pharmacist can reduce health service use and cost while improving the appropriateness of drug prescribing.

Pharmacists can facilitate improved prescribing and medicines management by working closely with the medical team.
Take home points

- Role of clinical pharmacist is important in patient care (pharmacist is an advocate for the patient).
- DRP’s is a reality because we are humans and we make mistakes.
- Acceptance rate among clinicians is a little below published rates so as pharmacists we have our work to do to completely integrate ourselves in the patient care team.
References


References


Thank you!