Clinical Pharmacy Services: Integrating Essential Care Components into a Busy HIV Practice

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Clinical Pharmacy Services

• Description of need:
  – General Medicine
  – HIV Medicine

• Description of services;
  – Adherence Counseling
  – Medication Reconciliation
  – Medication Therapy Management
  – Chart Review
  – Initiation of New HAART Regimens

• Case Studies
Background

- 20% of Americans are taking ten or more medications daily.
- Currently for every dollar spent on outpatient medications, a dollar is spent treating adverse events related to those medications.
- Inaccurate medication lists in the ambulatory clinic setting can be related to serious adverse drug events including fatal outcomes (1 of 131 outpatient deaths).
- Polypharmacy increases the risk of adverse drug events

HRSA 2008
Prescription Burden and Adherence

- 5,759 Patients initiating antihypertensive and lipid lowering agents for the first time.
- Prescription burden = number of meds taken year prior.
- Adherence defined as 80% or better of days covered.
  - #prior meds | % adherent
    | 0   | 41  
    | 1   | 35  
    | 2   | 30  
    | 10  | 20  

(Benner et al 2009)
HIV Patients and Medication Documentation

- 104 outpatients: 70% on HAART;
  - Detailed patient reporting vs. chart documentation:
    - Pill Burden was 20.7 +/- 12.5;
    - Patient reported medications was 15.7 vs. 8.4 documented.
    - Patient reported MD knowledge:
      - 80% for HAART
      - 10% for non-prescription medications

(Furler et al 2004)
HIV Inpatients

68 patients admitted on HAART:
At least one prescribing error in 72%
At least one prescribing error that had potential to cause moderate to severe consequences in 56%.

(Pastakia et al 2008)

83 patients admitted on HAART:
176 medication related problems were identified;
(drug-drug interactions most common)
57 ARV’s were incorrectly dosed;
Non specialist attending risk factor for errors.

(Mok and Minson 2008)
The CCC population

• Comprehensive Services: active population of about 2400 active patients; 1200 patient visits/month;

• Over 1266 validated OI’s diagnosed, 2,057 non-AIDS defining events diagnosed;

• Ages range from 14 to 76; 20% are 50 years or older; 50% substance abuse, 40% mental health diagnosis;

• 45% of patients are on 1-5 medications;

• 52% of patients are on 5 or more medications;

• 456 patients are on 10 or more medications;

• 6% of patients bring their medications to clinic.
Clinical Pharmacy Services Program: Goals

• To improve patient safety as it relates to medication use.
• To increase medication adherence.
• To solve medication-related problems for our patients.
• To increase patient education as it relates to medications.

*Ultimate goal is to improve health outcomes*
Clinical Pharmacy Services Provided

- Medication Reconciliation (face to face and phone)
- Medication Therapy Management
- Medication Adherence Counseling
- Prospective/Retrospective Drug Utilization Review
- New Medication Initiation Counseling
Medication Reconciliation

- The process of comparing a patient’s medication orders to all of the medications that the patient has been taking.
- Done to avoid medication errors such as: omissions, duplications, dosing errors, or drug interactions.
- Ideally, should be performed at every visit
- In Person, Phone, Pharmacy Verification
Medication Therapy Management (MTM)

- A comprehensive medication review to identify, resolve, and prevent medication-related problems, including adverse drug events
- A face-to-face encounter between clinical pharmacy team member and patient
Patient Benefits of MTM

- A clearer understanding of medications
  - Patient is provided a thorough explanation of what each medication (including herbals, dietary supplements, etc.) is used for, how it should be taken, and how to use/store properly
- Increases pt knowledge and empowerment, thereby decreasing likelihood of medication errors
Patient Benefits of MTM

• A thorough review of all medications:
  – Identify and address possible side effects
  – Check for possible allergies, adverse reactions, drug interactions, and dosing errors
  – Identify opportunities for patients to get the most benefit from their medications
Medication Adherence Counseling

• Discussion with patient regarding the importance of taking medications (specifically antiretrovirals)
  – Consequences of non-adherence
    • Viral resistance, disease progression

• Identifying and solving patient-related problems resulting in non-adherence
  – Social issues (medication costs, etc.)
  – Pill swallowing
  – Memory issues
Prospective/Retrospective Drug Utilization Review

- Review of a patient’s medical record either prior to a visit (prospective) or after a visit (retrospective) to identify and solve medication-related issues and/or adverse drug events
- Patient is not present (different from medication reconciliation and MTM)
New Medication Initiation Counseling

- A visit with a clinical pharmacy team member prior to initiation of ART
  - Assessing readiness to start medications
  - Identifying problems prior to starting ART
  - Providing medication-related education
  - Stressing importance of medication adherence
CCC targeted populations

- Hospital discharges;
- Anticoagulant therapy;
- Diabetics on insulin;
- HAART changes;
- Early virologic failures;
- Polypharmacy:
  - Chart review and prospective;
- Drug-Drug Interactions:
  - Chart review and real time;
Referral from primary care provider initiated

Medication Reconciliation
Medication Therapy Mgmt
New Med/Change of med
Adherence Counseling

Medication Reconciliation
Hospital Discharges
Hepatitis C Patients
Injection medication education

Medication Reconciliation
High risk patients (substance abuse issues)

Medication Reconciliation
Coumadin and Diabetes education/management
Smoking Cessation

Kim Lippard, RN Case Manager
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Ryan Moss, PharmD
Kim Lippard, RN Case Manager
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Ryan Moss, PharmD
Adverse Drug Events

- Adverse drug event (ADE): An injury, large or small, caused by use (or non-use) of a drug. It can be as harmless as a rash or as serious as death from an overdose. There are two types: those caused by errors and those occurring despite proper usage of a medication. If an ADE is caused by an error, it is by definition preventable. Non preventable ADEs (injury, but no error) are called adverse drug reactions (ADRs)
Potential Adverse Drug Event

- Potential adverse drug event (pADE): A medication error that has the potential to cause an ADE, but did not, either by luck (e.g. pt was not allergic despite a note in record saying so) or because it was intercepted prior to causing harm.
Progress so far....

Since January 2009:
- Total Patient Contacts: 651
- Total ADEs Discovered: 220
- Total pADEs Discovered: 446
Challenges of Hospitalizations

• 52 year old female admitted to local hospital with altered mental status, hypotension and found to be in acute renal failure. Discharged after 11 days.

• Comorbidities include:
  – Alcoholic cirrhosis of liver
  – Dementia
  – Anemia
  – AIDS
  – encephalopathy
• Patient presents for provider follow up 1 week after hospital discharge.
• Referred to pharmacy team for medication reconciliation and medication therapy management

What are the initial evaluation steps?
Initial Evaluation

• Does patient present with her medications?
• Is patient able to identify her medications (names, schedule, doses?)
• What is the patient’s process for taking her medications?
• How often does she miss doses?
• What is her understanding of why she takes the medications?
• What support system does the patient have?
• What psychosocial barriers exist?
• What do her lab results indicate?
Initial Evaluation

• Patient presents with a plastic bag of medications
• Patient unable to recall meds by name, recognizes by pill color
• Denies missing any doses of medications in past week (review of labs)
• No clear understanding of what medications are for what health issues
• Recently released from Rehab-admits to still drinking (40 oz beer per week) and crack use 1x/week
Reconciliation of medications

- Patient should have 8 active medications
- Discovered patient had continued previous ART regimen with new regimen-resulting in a double dose of one medication
- Patient was taking multiple doses of Lactulose due to various names (Lactulose, Enulose, Constulose)
- Taking previously discontinued antihypertensives
- Multiple pharmacies used
- Discharge medication list from hospital was inaccurate
What interventions would be most helpful and useful for this patient?
Priorities

• Must eliminate use of multiple pharmacies
• Thorough review of medications, indications, dosages and daily schedules
• Readdress substance abuse issues (regular psych follow up)
• Provide a picture flow sheet
• Simplify medication regimen
  – Pill boxes
  – Bubble packing
  – Recruit help of friend/family
  – Use of alarms for medication reminders
## Considerations

<table>
<thead>
<tr>
<th>Bubble Packs</th>
<th>Pill Boxes</th>
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<tbody>
<tr>
<td>• Once medications are bubble packed, they are “fixed” for a month</td>
<td>• Is patient able to fill boxes independently</td>
</tr>
<tr>
<td>• Patient’s medications should be stable with no anticipated changes</td>
<td>• Would patient benefit from weekly meetings with team to fill boxes-regular teaching and feedback</td>
</tr>
<tr>
<td>• Need to explain packs in detail</td>
<td>• Is there a friend or family member that could assist</td>
</tr>
<tr>
<td>• Not useful with PRN meds, non pill medications</td>
<td>• Not useful with PRN</td>
</tr>
<tr>
<td>Take These Medications</td>
<td>At These Times</td>
</tr>
<tr>
<td>------------------------</td>
<td>---------------</td>
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| **Prilosec**
(Dimeprazole)
20mg Capsule(s)       | 7am 8am 12N 6pm |
| 1 Capsule             | 1 Capsule     |

| Cymbalta
(Duloxetine HCl) | 7am 8am 12N 6pm |
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<table>
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<th>8</th>
<th>12</th>
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<td>Cymbalta</td>
<td>1</td>
<td>1</td>
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</table>

MyMedSchedule.com® Helping you take the right dose, at the right time.
Outcomes

• Patient denied further inpatient treatment for substance abuse
• Referred to Nashville Cares and First Response for alcohol and drug services
• Was able to bubble pack medications
• Friend, “Mary,” recruited to assist patient with regimen and sobriety
• Continued regular psych follow ups
• Labs indicate adherence to medications
• Regular phone calls
Barbara

- Barbara is a 45 year old single mother of two referred to the clinical pharmacy team for medication management and adherence.
- She is starting a new antiretroviral regimen.
- This will be her fourth ART regimen since she was diagnosed with HIV 13 years ago.
Barbara: Medical History

- PMH: HTN/Diabetes/Herniated disc
- Recent history of PCP/ Recurrent skin infections
- Failed three prior ART regimen- nausea, diarrhea and increased fatigue
- BP and blood sugar are well controlled
- CD4 count is 53 cells/mm³ and HIV-1 RNA is 436,000 copies/ml.
Barbara: HIV Knowledge

- She does not know what her CD4 cell count or viral load are.
- She had not been aware of the significance of opportunistic infections until her recent diagnosis of PCP.
- She has no idea what an acceptable viral load is when on ART.
- She denies knowledge of HIV re-infection or the relationship between viral load and risk of HIV transmission.
Barbara: Social History

- Single mother of two; two years of college.
- Lives alone in an apartment.
- Family aware of her diagnosis/supportive.
- He boyfriend is HIV negative / aware of her status.
- She has also had sex with two other men in the last one year.
- She did not disclose her status due to fear of rejection.
- She uses condoms about 50 percent of the time.
- She smokes marijuana to improve appetite. Drinks alcohol too when she is “down”.
- She babysits her grandson on weekends.
“Drugs do not work in patients who don't take them”

C. Everett Koop, MD
Adherence

- **What is Adherence to Treatment?**
- Adherence to a medication regimen is generally defined as the extent to which patients take medications as prescribed by their healthcare providers.
Adherence Barriers

• What are the barriers to Barbara’s adherence to ART?
  • Side effects of ART;
  • Denial;
  • Drug / alcohol abuse;
  • Untreated psychiatric illness;
  • Lack of knowledge of HIV / HIV treatment / consequences of untreated HIV;
  • Confidentiality / stigma – fear of disclosure;
  • Other barriers
    – Dementia / forgetfulness
    – Homelessness
    – Hectic lifestyle
    – Pill Fatigue
    – Lack of insurance / medication co-pay
Strategies for Improving Adherence to Medication regimen

- Identify poor adherence
- Look for markers of non-adherence: missed appointments (“no-shows”), lack of response to medication, missed refills.
- Ask about barriers to adherence without being confrontational.
- Emphasize the value of the regimen and the effect of adherence.
- Elicit patient’s feelings about his or her ability to follow the regimen, and if necessary, design supports to promote adherence.
Strategies for Improving Adherence to Medication regimen

- Provide simple, clear instructions and simplify the regimen as much as possible.
- Encourage the use of a medication-taking system/strategies.
- Listen to the patient, and customize the regimen in accordance with the patient’s wishes.
- Obtain the help from family members, friends, and community services when needed.
- Reinforce desirable behavior and results when appropriate.
- Consider more “forgiving” medications when adherence appears unlikely.
Conclusion

- She was evaluated by the psychiatrist and started on Zoloft.
- She joined a support group for alcohol and drug abuse.
- Attendance at the support group was sporadic at first, but improved with time.
- She has relapsed twice since April, 2009.
- She self-reported her relapses and took immediate corrective action.
- As for her ART, she used phenergan for nausea for the first two weeks and her nausea resolved.
- She never complained of diarrhea. She has had good adherence, except for occasional missed doses on weekends.
- Reports that bubble packing helps her to have accurate count of missed dose(s).
- Setting the alarm on her cell phone to her medication times coupled with reminder text messages have been effective in improving her adherence.
- Patient achieved undetectable viral load after four months on therapy and has remained undetectable ever since.
- She has not experienced skin infections in the last 4 months and her energy level has improved.
- She is spending more time with her whole family, especially her grandson.
- She attends clinic regularly and is enjoying life again.
Medications: Epzicom/Raltegravir/Intelence

<table>
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<tr>
<th>Date</th>
<th>CD4</th>
<th>%</th>
<th>VIRAL LOAD</th>
<th>Hgb A1C</th>
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<td>4</td>
<td>133k</td>
<td></td>
</tr>
<tr>
<td>04/2009</td>
<td>30</td>
<td>3.3</td>
<td>436K</td>
<td></td>
</tr>
<tr>
<td>7/2009</td>
<td>106</td>
<td>9.6</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>8/2009</td>
<td>135</td>
<td>5.4</td>
<td>&lt;48</td>
<td>6.9%</td>
</tr>
<tr>
<td>10/2009</td>
<td>185</td>
<td>7.7</td>
<td>&lt;48</td>
<td></td>
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</table>
Case Presentation

• Chief Complaint: 42 yo AAM presents to ER w/ mild SOB, cough, and fatigue

• History of Present Illness:
  – One week history of coughing and fatigue
  – 3 week history of weight gain and LE edema
Case Presentation (cont.)

- PMH:
  - HIV- dx 1998
  - Disseminated Histoplasmosis
    - Dx 7/09
    - Completed 2 weeks of amphotericin B
  - Adrenal Insufficiency
  - Hypertension
  - Illicit drug use
Case Presentation (cont.)

- Active Medication List
  - darunavir/r
  - tenofovir/emtricitabine
  - itraconazole 200mg BID
  - dexamethasone 0.25mg daily
  - furosemide 20mg daily
  - KCL 20 mEq daily
  - sulfamethoxazole/trimethoprim DS on MWF
  - testosterone cypionate IM monthly
  - quetiapine XR 200mg daily
Case Presentation (cont.)

• Labs
  139 102 8   Glu:79
  3.1 23 0.99
  – AST: 81  ALT: 92
  – Itraconazole Level (Random): 3.4µg/ml
  – CD4+: 79
  – VL: 3690
Case Presentation (cont)

• Physical Assessment
  – CV:
    • EKG- QT prolongation
    • 2+ bilateral pitting edema
  – Lungs:
    • No wheezing
    • No crackles
    • No ronchi
Case Presentation (cont.)

• Hospital Course:
  – Pt not admitted to hospital
  – Furosemide dose increased to 40mg daily
  – Pt scheduled for f/u at CCC in 2 days
Where does a CPS team fit in this case?
Medication Reconciliation: Drug Interactions

- Drug-drug interactions may impact:
  - Bioavailability
  - Pharmacokinetics
  - Efficacy
  - Toxicity

What was the potential drug interaction in this case?
Itraconazole Drug Interactions: Brief Review

- Absorption
  - Increased pH = decreased absorption

- Metabolism- Both a substrate for and inhibitor of CYP3A4 enzymes and P-glycoprotein
  - May affect the efficacy and toxicity of many other medications
  - CYP3A4 inhibitors (like PIs) may increase itraconazole levels
  - CYP3A4 inducers (like efavirenz) may decrease drug levels
Case Presentation (cont)

- **Clinic course:**
  - Drug interaction with PI/itraconazole identified
  - Itraconazole dose decreased to 100mg BID
  - Labs:
    - 139 105 12 Glu: 70
    - 4.2 22 1.16
  - Itraconazole level pending

**WHAT ELSE CAN THE CPS TEAM DO?**
Drug Interactions: Applications to the Entire Clinic

- 40 CCC pts on itraconazole
  - 29 pts on itraconazole + PI
  - 11 pts on itraconazole + NNRTI

- CPS role
  - Assess each current itraconazole dose vs. recommended dose
  - Alert provider of any dosing discrepancies
  - Alert provider when to consider itraconazole therapeutic drug monitoring
  - F/U on drug levels when applicable
• Questions or Comments?