Program Overview

- Background
- NU Experience
- DRP Documentation
- Documenting for the Future

Background

- ACPE Standards 2007 and Guidelines emphasize importance of the following reports to improve medication safety and patient outcomes:
  - Institute of Medicine Report
  - Cape Outcomes
  - Medicare Modernization Act of 2003
  - ASHP 2015 Initiative for Change
Program Assessment

- Question: to what extent were the P4 students involved in patient care?
- What disease states did the P4 students “see” on rotations?
- What populations did the P4 students interact with during rotations?
- Did the P4 students recognize drug related problems?
- Could the students suggest corrective measures for drug related problems?

Intervention Documentation: the NU experience

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Intervention Documentation

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Drug Related Problem Intervention Documentation

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Process: Form Development

Clinical Committee reviewed existing forms and designed a form to collect the following information:
- Drug problem identification
- Pharmacotherapy interventions
- Patient Population Demographics
- Disease State Encounters
- Drug Involved
- Time Involved
- Estimated Cost Savings
- Written Summary of Recommendation by Student
- Acceptance (or not) of Recommendation

Clinical Committee
VCU College of Pharmacy Faculty
- Kimberly Cappuzzo
- Rebecca Collins
- Cynthia Kirkwood
- Laura Morgan
- Brigitte Sicat
- Amy Whitaker
- Melissa Williams
- Nancy Yunker
- Beverly Talluto (chair)
Disease States

- Beta Test had disease states printed on back of DRP form for students to check off.
- Electronic version has a drop down menu of disease states to select from.

<table>
<thead>
<tr>
<th>Bone and Joint</th>
<th>Dermatologic</th>
<th>Gastrointestinal continued</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osteoarthritis</td>
<td>Acne</td>
<td>Gout</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>Ulcers: gastric / duodenal</td>
<td>Drug-Induced Disorders</td>
</tr>
<tr>
<td>Rheumatoid Arthritis</td>
<td>Anemia</td>
<td>Hematologic Disorders</td>
</tr>
<tr>
<td>Cardiac/Vascular Disease</td>
<td>Type 2 Diabetes</td>
<td>Upper GI Bleeding</td>
</tr>
<tr>
<td>Angina</td>
<td>Diabetes Type Unknown</td>
<td>Pancreatitis</td>
</tr>
<tr>
<td>Arrhythmia</td>
<td>Type 1 Diabetes</td>
<td>Thrombosis (DVT)/PE</td>
</tr>
<tr>
<td>Atrial Fibrillation</td>
<td>DKA</td>
<td>Sick Cell Anemia</td>
</tr>
<tr>
<td>Heart Failure</td>
<td>Thyroid Disorder</td>
<td>Disease</td>
</tr>
<tr>
<td>Hypertension</td>
<td>Gastrointestinal</td>
<td>Gastric / Duodenal</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>Chronic Constipation</td>
<td>Ulcers: gastric / duodenal</td>
</tr>
<tr>
<td>Myocardial Infarction</td>
<td>Cirrhosis</td>
<td>Pancreatitis</td>
</tr>
<tr>
<td>Peripheral Vascular</td>
<td>Diarrhea</td>
<td>Ulcers: gastric / duodenal</td>
</tr>
<tr>
<td>Hepatitis</td>
<td>Asthma</td>
<td>Drug-Induced Disorders</td>
</tr>
<tr>
<td>Inflammatory Bowel Disease</td>
<td>Sinusitis</td>
<td>Hematologic Disorders</td>
</tr>
<tr>
<td>Nausea and Vomiting</td>
<td>Urinary Tract</td>
<td>Upper GI Bleeding</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Neurological</th>
<th>Renal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dementia</td>
<td>Acute Renal Failure</td>
</tr>
<tr>
<td>Headache</td>
<td>Chronic Renal Failure</td>
</tr>
<tr>
<td>Migraine</td>
<td>Dehydration</td>
</tr>
<tr>
<td>Pain Management</td>
<td>Electrolyte Disturbance</td>
</tr>
<tr>
<td>Parkinson's Disease</td>
<td></td>
</tr>
<tr>
<td>Seizure Disorder</td>
<td>Respiratory</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>Asthma</td>
</tr>
<tr>
<td>Stroke</td>
<td>Allergic Rhinitis</td>
</tr>
<tr>
<td>ADHD</td>
<td>COPD</td>
</tr>
<tr>
<td>Alcoholism</td>
<td>Drug-Induced Disease</td>
</tr>
<tr>
<td>Anxiety Disorder</td>
<td></td>
</tr>
<tr>
<td>Bipolar Disorder</td>
<td></td>
</tr>
<tr>
<td>Depression</td>
<td></td>
</tr>
<tr>
<td>Psychosis</td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td></td>
</tr>
</tbody>
</table>
**Drug Related Problem (DRP)**

**Drug and Disease**

- Top 200 Prescription Drugs
- Top 100 Institutional Drugs
- Drop down menu to select drug
- System allows input of drug or disease state not on list

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**DRP Classification**

**B. DRUG RELATED PROBLEM (DRP) CLASSIFICATION**

1. Adverse Drug Reaction
   - A) Toxicity
   - B) Allergic reaction
   - C) Side effect

2. Drug Choice
   - A) Drug needed not prescribed
   - B) Drug prescribed not needed
   - C) Drug duplication
   - D) Cost of therapy
   - E) Contraindication
   - F) Inappropriate drug
   - G) Inappropriate dosage form

3. Dosing
   - A) Dose too low or frequency not enough
   - B) Dose too high or frequency too often
   - C) Duration inappropriate

4. Drug Use
   - A) Wrong dose taken/administered
   - B) Wrong drug taken/administered
   - C) Drug not taken
   - D) Incorrect storage
   - E) Incorrect administration

5. Interaction
   - A) Drug-drug interaction
   - B) Drug-disease interaction
   - C) Drug-food interaction
DRP Classification

6. Patient/Provider
   - A) Drug product not available
   - B) Patient doesn't understand instructions
   - C) Patient misuse (over-use/under-use)
   - D) Non-adherence
   - E) Prescription/Transcription

7. Patient Comprehension
   - A) Health Promotion
   - B) Disease Prevention

Interventions

CHECK ALL that apply.

1. Drug
   - A) Discontinue therapy
   - B) Change medication
   - C) Add medication (Rx)
   - D) Add medication (OTC)
   - E) Change dose
   - F) Change dosage form
   - G) Change dosing interval
   - H) Therapeutic drug monitoring

2. Prescriber
   - A) Collaborative practice
   - B) Prescriber contacted
   - C) Consult left recommendation

Interventions

3. Prescriber Drug Information
   - A) Adverse effect
   - B) Compatibility/stability
   - C) Compounding
   - D) Dosing/administration
   - E) Herbal products
   - F) Pharmacology/pharmacokinetics
   - G) Pregnancy/lactation
   - H) Use or Indication

4. Patient
   - A) Refer patient
   - B) Disease management program
   - C) Drug regimen review
   - D) Patient contacted
   - E) Payer contacted
   - F) Pharmacy contacted
### Interventions

#### 5. Patient Education
- A) Diabetes
- B) Hypertension
- C) Osteoporosis
- D) Cholesterol
- E) Asthma
- F) Anticoagulation
- G) Medication adherence
- H) Discharge counseling
- I) Other

#### 6. Patient Training
- A) Insulin pump
- B) Insulin administration
- C) Blood glucose meter
- D) Blood pressure monitoring
- E) Inhaler
- F) Adherence device
- G) Other

#### 7. Life Style Changes
- A) Diet
- B) Exercise
- C) Smoking cessation
- D) Alcohol moderation

#### 8. Screenings
- A) Hypertension
- B) Diabetes
- C) Osteoporosis
- D) Cholesterol

*Complete the INTERVENTION SPECIFICS COLUMNS*

Student complete a short discussion on the intervention for the preceptor to review, accept, send feedback to the student and submit.

### Results of Recommendation

CHECK ALL that apply.
- A) Accepted by prescriber
- B) Accepted by consult team
- C) Accepted by patient
- D) Not accepted by ________________
- E) Unknown
Actual Time Involved

A) 5 minutes or less
B) 6-15 minutes
C) 16-29 minutes
D) 30-59 minutes
E) over 60 minutes

Expected Outcomes

A) Improved efficacy
B) Improved safety
C) Improved adherence
D) Cost saving (institution)
E) Cost saving (patient)

Form (Available as Handout)
(show example from flashkey)
Process: Data Collection Pilot

- Designed to be collected electronically
- Paper form was used for Beta Testing by students on rotation with faculty on the Clinical Advisory Board
- About 25 interventions/patient centered rotation were collected
- Forms were revised based on initial feedback from students and preceptors

Compare Results to Electronic Entry

- **One** rotation period (Class of 2009)
- Six rotation types (Ambulatory Care, Institutional, Acute Care, Community, Advanced Community, Geriatrics)
- **1641** patient interventions
  - (data being analyzed for final presentation in July)

Gender and Age

<table>
<thead>
<tr>
<th>Patient Demographics</th>
<th>Pilot Study Paper (5 rotations) (365 DRP’s)</th>
<th>Electronic (1 rotation 1641 DRP’s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>196 F (54%)</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;80</td>
<td>111 (30.7)</td>
<td></td>
</tr>
<tr>
<td>70-79</td>
<td>90 (24.9)</td>
<td></td>
</tr>
<tr>
<td>50-69</td>
<td>113 (31.3)</td>
<td></td>
</tr>
<tr>
<td>20-49</td>
<td>46 (12.7)</td>
<td></td>
</tr>
<tr>
<td>0-19</td>
<td>1 (0.3)</td>
<td></td>
</tr>
</tbody>
</table>
Top 5 Drug Related Problem Classifications Chosen

<table>
<thead>
<tr>
<th>Pilot Study Paper (5 rotations) (365 DRP's)</th>
<th>Electronic (1 rotation 1641 DRP's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Drug needed not prescribed</td>
<td></td>
</tr>
<tr>
<td>2. Dose too high or frequency too often</td>
<td></td>
</tr>
<tr>
<td>3. Dose too low or frequency not enough</td>
<td></td>
</tr>
<tr>
<td>4. Inappropriate drug</td>
<td></td>
</tr>
<tr>
<td>5. Drug prescribed not needed</td>
<td></td>
</tr>
</tbody>
</table>

Top 5 Drug Interventions

<table>
<thead>
<tr>
<th>Pilot Study Paper (5 rotations) (365 DRP's)</th>
<th>Electronic (1 rotation 1641 DRP's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Change Dose</td>
<td></td>
</tr>
<tr>
<td>2. Add Prescription Drug</td>
<td></td>
</tr>
<tr>
<td>3. Discontinue Drug</td>
<td></td>
</tr>
<tr>
<td>4. Change Medication</td>
<td></td>
</tr>
<tr>
<td>5. Change Interval</td>
<td></td>
</tr>
</tbody>
</table>

Top 5 Drugs Selected for DRP

<table>
<thead>
<tr>
<th>Pilot Study Paper (5 rotations) (365 DRP's)</th>
<th>Electronic (1 rotation 1641 DRP's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Warfarin</td>
<td></td>
</tr>
<tr>
<td>2. Lovenox</td>
<td></td>
</tr>
<tr>
<td>3. Lisinopril</td>
<td></td>
</tr>
<tr>
<td>4. Glipizide</td>
<td></td>
</tr>
<tr>
<td>4. Hydrochlorthiazide</td>
<td></td>
</tr>
<tr>
<td>5. Oxycodone</td>
<td></td>
</tr>
</tbody>
</table>
Top 5 Disease States

<table>
<thead>
<tr>
<th></th>
<th>Pilot Study Paper (5 rotations) (365 DRP's)</th>
<th>Electronic (1 rotation 1641 DRP's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Hypertension</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Hyperlipidemia</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Type 2 Diabetes</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Pain Management</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Anemia</td>
<td></td>
</tr>
</tbody>
</table>

Percent of Interventions Requiring 0 to >60 minutes

<table>
<thead>
<tr>
<th></th>
<th>Pilot Study Paper (5 rotations) (365 DRP's)</th>
<th>Electronic (1 rotation 1641 DRP's)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0- 5 minutes</td>
<td>48%</td>
<td></td>
</tr>
<tr>
<td>6-15 minutes</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>6-29 minutes</td>
<td>12%</td>
<td></td>
</tr>
<tr>
<td>30-59 minutes</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>&gt;60 minutes</td>
<td>11%</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions

- Documentation using a web-adaptable paper form demonstrates the variety of drug related problems and interventions that students can document in their APPEs in a reasonable length of time.
- Identifying patient populations and disease state encounters helps define areas that need further curricular development and program assessment.
Limitations

- Assuring that preceptors review and give feedback
- Students not always select disease state
- Managing Volume of Data Collected
- Creating meaningful reports
- Giving timely feedback to sites/students