Evaluation of Inpatient Medication Errors in HIV Patients Receiving HAART

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When it matters most.

Disclosure Statement

Disclosure statement: these individuals have the following to disclose concerning possible financial or personal relationships with commercial entities (or their competitors) that may be referenced in this presentation.

- Susan Norman nothing to disclose
- Samantha Bailey nothing to disclose
- Jason Brady nothing to disclose

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Presentation Objective

Describe the role of a clinical pharmacist in assuring correct use of antiretrovirals in hospitalized patients

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Background

- Highly active antiretroviral therapy (HAART) can substantially reduce mortality and morbidity in patients with HIV
- Current literature reports a high number of patients with at least one HAART related error, in the range of 25% to 86%

HIV: Human immunodeficiency virus

Palella JF, et al. *N Engl J Med* 1998;338:853-60.

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Factors Contributing to Errors

- 28 different formulations of antiretrovirals for treatment of HIV
- Complex regimens
- Patient comorbidities, concurrent medications
- Need for renal and hepatic dosage adjustments
- Lack of HIV expertise by clinicians

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Faragon JJ, et al. AIDS Read. 2003;13(6):268-70, 274-8.

The Clinical Pharmacist's Role

- Heelon et al. found a reduction in duration of errors[1]
  - 3.5 days in retrospective cohort
  - 1 day in a prospective group where clinical pharmacist reviewed medication profiles for errors
- Pastakia et al. identified at least one error in 84% of patients and found a 100% clinical pharmacist recommendation acceptance rate to rectify errors[2]

1. Heelon M, et al. *Am J Health-Syst Pharm* 2007;64:2064-8.
2. Pastakia SD, et al. *Ann Pharmacother* 2008;42:491-7.

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Medication Reconciliation

- It has been estimated that 46% of medication errors occur on admission or discharge
- Occurs as a multi-step process at Orlando Regional Medical Center (ORMC)
  - Traditionally nursing responsibility to obtain medication list
  - Physician reviews and signs list
  - Active orders entered by unit secretary or nurse

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Pronovost P, et al. J Crit Care 2003;18(4):201–5.

Medication Reconciliation

Drug Name	Instructions
Atripla oral tablet	1 tab(s) orally once a day (in the evening)
Multiple Vitamins oral tablet	1 tab(s) once a day
Zegerid 20 mg-1100 mg oral capsule	1 tab(s) once a day
Percocet 5/325 oral tablet	1-2 tab(s) orally every 4 hours as needed for pain

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Medication Reconciliation

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Home Medication: Physician Verification & Order/Medication Reconciliation

Current Location [redacted] Patient Name: [redacted] Age: [redacted]

MR# [redacted] **Acct#** [redacted] Admission Date: [redacted]

Allergies/Reactions: penicillin, sulfur topical

Weight: 68.04 Kg (149.69 lbs) 01/15/2011 Height: 177.8 cm (5 ft. 10 in.) 01/15/2011

Date Printed: 04/06/2011 13:53 Printed By: NOR Pharmacy\Orlando Health

Home Medication / Product Summary

M.D. to complete. Continue during hospitalization?		ADM Medications (s) already ordered	Medication or Product Name		Route	Frequency Indication Required for All PRN:	Date/Time of Last Dose. (Write if known)	DISCH M.D. to complete. Continue after hospitalization?		Physician #
No	Yes		Atripla oral tablet	600 mg-200 mg-300 mg	oral	once a day (in the evening)		No	Yes	
					1 tab(s) orally once a day (in the evening)					
No	Yes		Multiple Vitamins oral tablet			once a day		No	Yes	
					1 tab(s) once a day					
No	Yes		Percocet 5/325 oral tablet	325 mg-5 mg	oral	every 4 hours		No	Yes	
					1-2 tab(s) orally every 4 hours as needed for pain					
No	Yes		Zegerid 20 mg-1100 mg oral capsule			once a day		No	Yes	
					1 tab(s) once a day					

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Medication Reconciliation

Pilot program at ORMC involves a pharmacy team

- Consists of pharmacists and trained pharmacy technicians
- Obtain medication history from patient
- Allows for physician computerized review and ordering

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Purpose

To evaluate the number and type of errors and identify improvements in the care of HIV inpatients through clinical pharmacist identification and reconciliation of errors

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Objectives

- Describe the number and type of errors that occur related to HAART during hospitalization
- Evaluate the role of a clinical pharmacist in identifying these errors
- Assess the acceptance of a clinical pharmacist's interventions to the prescriber

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Study Design

- Single-center, IRB-approved, concurrent study
- Conducted at ORMC from November 2010 – February 2011
- Inclusion
  - Age ≥18 years
  - Receiving HAART for treatment of HIV
  - Active inpatient HAART orders
- Exclusion
  - Patients initiated on HAART during current hospitalization

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Data Collection

- Patient identification through clinical information system
- Chart review and medication history
- Demographics: age, gender, height, and weight
- Allergies
- Active inpatient medication profile
- Laboratory data

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Errors to be Evaluated

- Medication reconciliation incorrect or incomplete
- Prescribing errors
  - Incomplete regimen
  - Dosing errors (under/overdose)
  - Incorrect renal adjustments
  - Drug-drug interactions
  - Administration schedule errors
  - Delays of therapy > 24 hours
  - Other

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Baseline Demographics

Patient Selection: 89 patients screened and 87 included in data analysis

Characteristic	N=87
Age, median (range), years	48 (21-71)
Male, n (%)	63 (72)

Characteristic	n=47
$CD4^+$ cell count, median (range), cells/μL	206 (5-902)

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Results

Identified Errors

Parameter	N=87
Errors, n	134
Errors, mean ±SD	1.54 ±1.26
Patients with ≥ 1 error, n (%)	67 (77)

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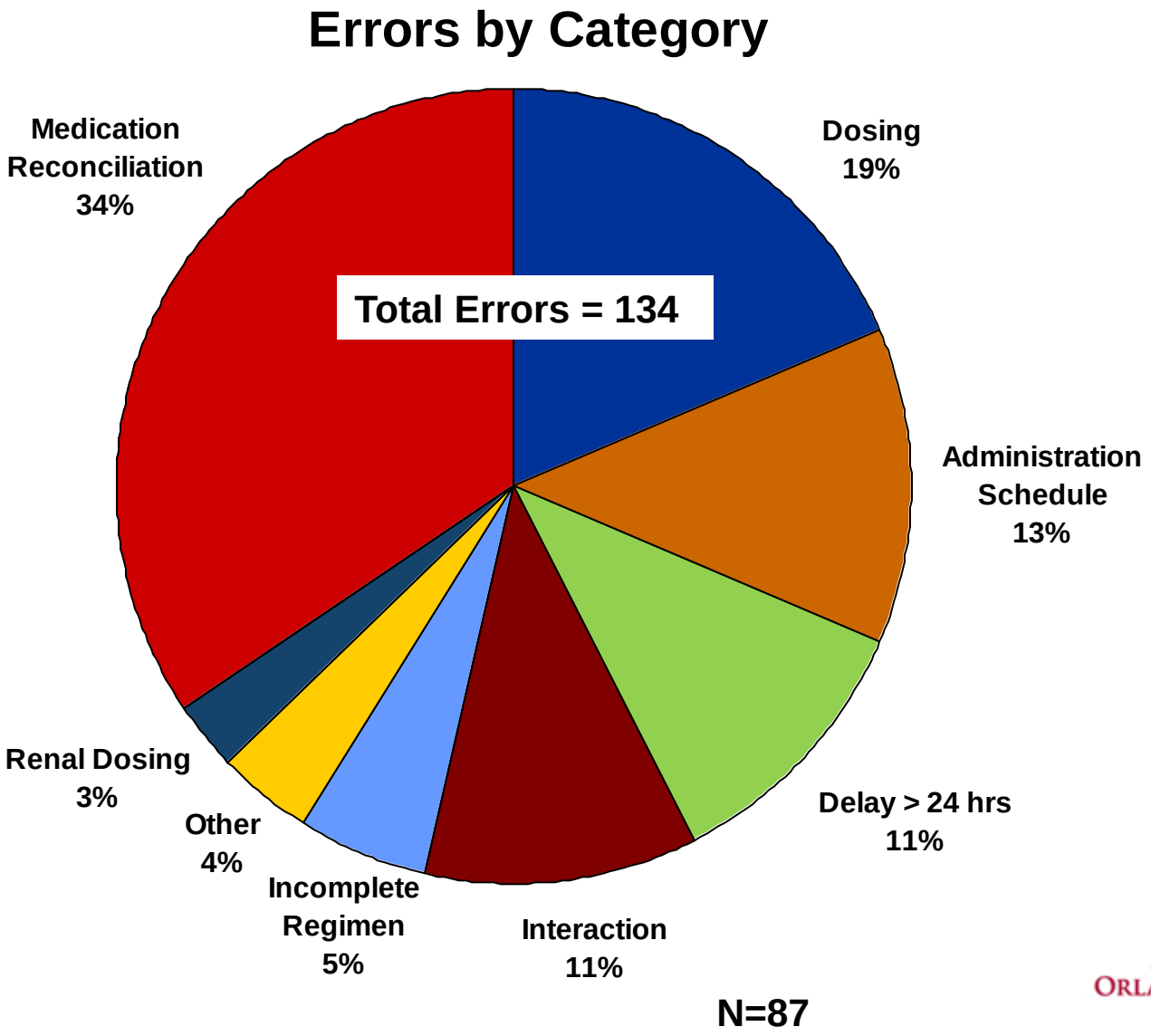
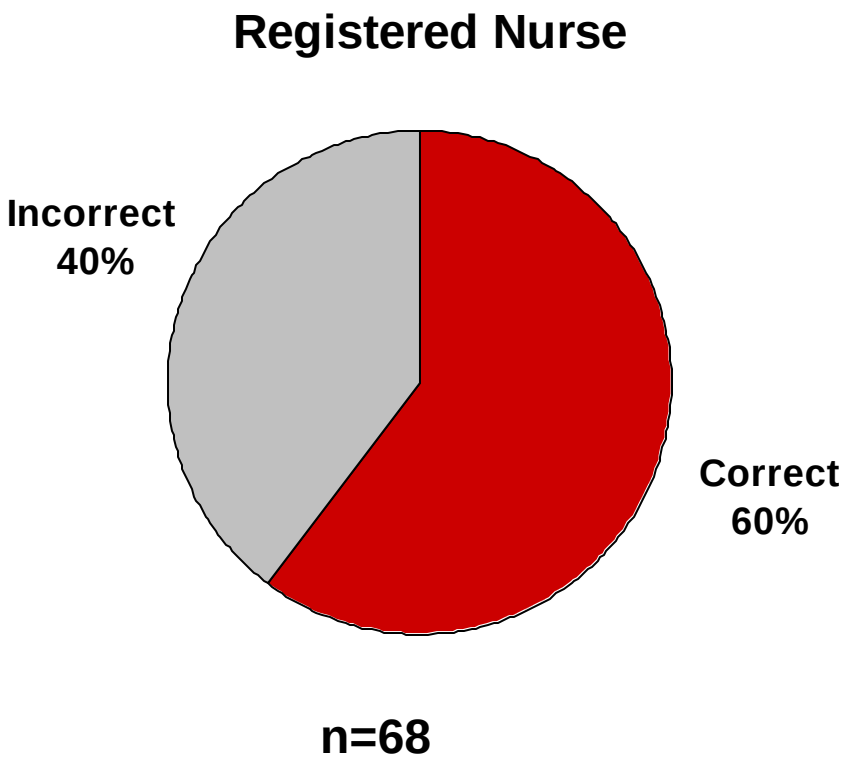
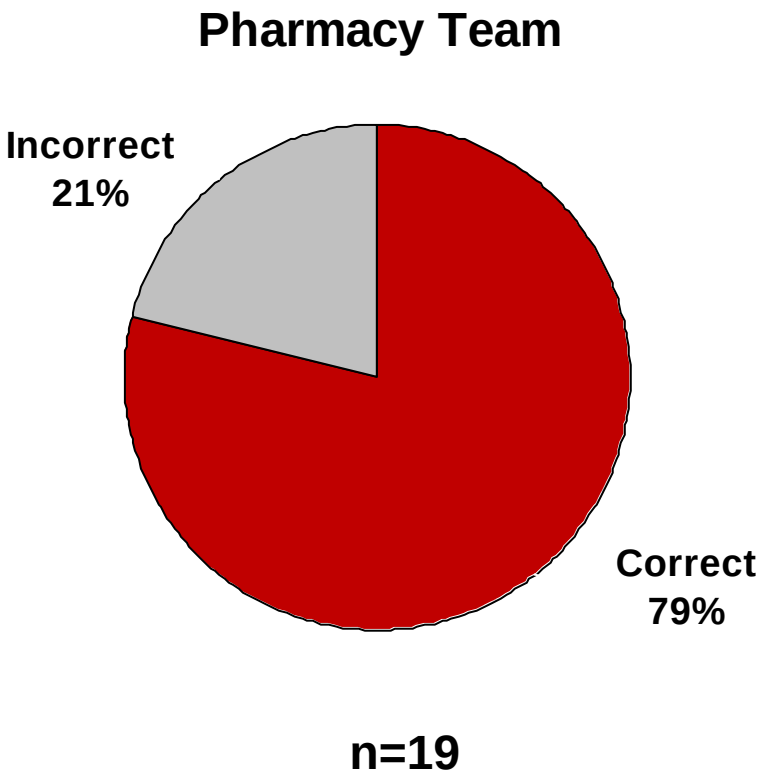
Results


Errors by Category
Medication Reconciliation 34%
Dosing 19%
Total Errors = 134
Administration Schedule 13%
Renal Dosing 3%
Other 4%
Incomplete Regimen 5%
Interaction 11%
Delay > 24 hrs 11%
N=87

Results: Medication Reconciliation





Results

Impact of Clinical Pharmacist

Parameter	N=87
Interventions, n (mean)	106 (1.2)
Interventions accepted, n (%)	106 (100)

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Conclusions

- Significant number of errors identified
  - Medication reconciliation
  - Dosing
- High acceptance rate of interventions
- Pharmacy led medication reconciliation team reduced errors

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Limitations

- Not all errors captured
  - Patients not started on home antiretrovirals
  - Errors rectified at time of order entry
- Not all types of errors considered
  - Omission of instructions for administration related to food was not included
  - Only ordered administration times were assessed

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Future Directions

- Education for pharmacy medication reconciliation team
- Improvements in clinical information system
- Clinical pharmacy involvement in care of HIV patients receiving HAART

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Self Assessment

What was the most common error identified in this study?

A. Delay in initiation of HAART
B. Incorrect dosing
C. Incorrect/incomplete home medication reconciliation
D. Drug-drug interactions

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- Jason Brady, Pharm.D., BCPS
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