Optimizing Anemia Management through Medication Reconciliation

Applying the 2009 Joint Commission Patient Safety Goal Requirements

Objectives

- List the Joint Commission’s (TJC) National Patient Safety Goals
- Describe the concept of medication reconciliation and its impact on continuity of care
- Discuss the importance of maintaining a stable Erythropoietic Stimulating Agent (ESA) dosing regimen
- Recognize studies that support the financial and therapeutic benefits of ESA reconciliation
- Explain how to implement an ESA continuity of care program

ARS Test Question: Which baseball player has won the most World Series?

1. Babe Ruth
2. Willie Mays
3. Hank Aaron
4. Yogi Berra
Joint Commission: National Patient Safety Goals (NPSGs)

- NPSGs highlight serious patient safety issues that need to be addressed by health care organizations
- Compliance is critical for accreditation
- Updated annually based on literature reviews by TJC and Patient Safety Advisory Committee
- Overseen by patient safety experts, nurses, physicians, pharmacists, and risk managers
- NPSG #8 Accurately and completely reconcile medications across the continuum of care

Continuity of Care

- Patients often receive care from a myriad of providers
- The current health infrastructure does not facilitate effective coordination and communication between providers (particularly in the case of medication therapy), resulting in fragmentation of patient care
- Health care professionals, including pharmacists, must address these gaps to improve the quality of patient care

Continuity of Care

- December 2003: American Society of Health-System Pharmacists (ASHP) Continuity of Care Task Force established in response to the continuity of care policy statement

Continuity of Care Policy Statement:

“To recognize that continuity of care is a vital requirement in the appropriate use of medications; further, to strongly encourage pharmacists to assume professional responsibility for ensuring the continuity of pharmaceutical care as patients move from one setting to another (e.g., ambulatory care to inpatient care to home care); further, to encourage the development of strategies to address the gaps in continuity of pharmaceutical care.”

References:
Definition of Continuity of Care in Medication Management

- A longitudinal process that is coordinated and provided among practitioners and organizations over time, consistent with the ongoing needs of the individual patient
- Medication management is an essential component of continuity of care

Discontinuity of Care: Practice Gaps and Barriers

- Clinical gaps
- Communication gaps
- Patient gaps
- Organizational gaps
- Coordination gaps
- Professional gaps
- Policy gaps
- Technology gaps

Recommended Actions to Improve CCMM

- Educate health care providers on the many facets of CCMM via continuing education, training tools, and publications
- Develop best practice standards with an interdisciplinary and multidisciplinary focus
- Develop the role of pharmacists in the provision of medication therapy management services and the importance of these services in continuity of care
- Support accreditation standards that encourage and require an improvement in continuity of care
- Promote research that supports the need for continuity of care
- Advocate for the integration of continuity of care concepts into the educational curriculum of health care professionals
Medication Reconciliation

Medication Reconciliation

• Medication reconciliation:
  The process of identifying and comparing a patient’s current medications with those that may be prescribed during an inpatient hospitalization

• Patients are at high risk for harm from adverse drug events when communication about medications is not clear, particularly when the individuals are involved in patient care setting change

• Medication reconciliation can reduce medication errors and improve patient care


Medication History

• Data suggest that:
  • 60% of hospital patients have at least 1 discrepancy in their admission medication history1,2

  • Approximately 6% of patients experience an inadvertent drug discontinuation of a serious nature on admission to the hospital3

  • Over a quarter of hospital prescribing errors are attributable to incomplete medication histories being obtained at the time of admission4


Systematic Review of Medication History Errors at Admission

- A systematic literature review (1966-2005) was conducted to describe the frequency, type, and clinical importance of medication history errors at the time of hospital admission.
- Reviewed all studies with quantitative results that compared prescription medication histories obtained by physicians with comprehensive medication histories.


Systematic Review of Medication History Errors at Admission

- Identified 22 studies involving 3755 patients.
- Errors in prescription medication histories occurred in up to 67% of patients:
  - Omission error(s): 10-61% of patients
  - Commission error(s): 13-22% of patients
  - Omission or commission error(s): 60-67% of patients
- Three studies evaluated a broad range of error types:
  - Omission errors: 42-69% of all errors
  - Dose or frequency errors: 30-42% of all errors
- Five studies distinguished between intentional changes and unintentional discrepancies:
  - 27-54% of patients had at least 1 medication history error and 16-75% of these discrepancies were unintentional.
- In 6 studies, an estimated 11-59% of medication history errors were clinically important.


Gaps in Medication Information Transfer

- A prospective review was conducted to identify drug-related problems experienced by end-stage renal disease (ESRD) patients upon hospital admission and to determine whether these problems could be related to gaps in medication information transfer.
- A total of 199 drug-related problems were identified in 47 patients:
  - Average of 4.2 problems per patient
  - Most common problem: patient required drug but was not receiving it (51.3%)
  - 65% of drug-related problems were related to gaps in medication information transfer.
    - 21.5% occurred between ambulatory clinic pharmacists and the inpatient hospital.
    - 17.7% occurred between the patient and the admitting physician.

Without medication reconciliation, and incomplete medication can cause:

1. Interrupted or inappropriate drug therapy
2. Adverse drug reactions
3. Clinical deterioration during hospitalization
4. All of the above

Which Joint Commission National Patient Safety Goal focuses on accurate and complete reconciliation of medications across the continuum of care?

1. NPSG-1
2. NPSG-8
3. NPSG-11
4. NPSG-18

Gaps in which of the following results in discontinuity of care?

1. Clinical gaps
2. Communication gaps
3. Organizational gaps
4. All of the above
ESA Continuum of Care
“Proof of Concept”
Therapeutic and Financial Benefits

Medication Reconciliation in Chronic Disease

- Medication reconciliation is particularly important for patients with chronic conditions requiring frequent hospital stays, to ensure therapeutic consistency between inpatient and outpatient settings.

- Such conditions commonly include:
  - Cancer
  - Kidney disease

Importance of ESA Dosing Regimen Maintenance

- Patients with cancer or chronic kidney disease are often anemic and receive ESA therapy to treat their anemia.

- Maintaining an ESA dosing regimen between the outpatient and inpatient settings is important to prevent fluctuations in hemoglobin level and administration of unnecessary ESA doses.

- The continuum of treatment is crucial, as anemia is associated with:
  - Increased mortality
  - Increased morbidity
  - Fatigue

References:
ESAs: Outpatient to Inpatient Medication Reconciliation

- ESAs may provide therapeutic effects for:
  - Up to 3 weeks in oncology patients
  - Up to 4 weeks in nephrology patients
  - Facilities may dispense inpatient ESA doses without reconciling when the last outpatient dose was administered
  - This results in:
    - Unnecessary therapeutic duplication
    - Increased pharmacy expenditure


When an ESA is used in your outpatient oncology clinic, which of the following frequencies are most commonly used?

1. Weekly
2. Every 2 weeks
3. Every 3 weeks
4. Other

ESAs and Hospital Reconciliation

- Medication reconciliation is challenging for therapies that are not taken on a daily basis
  - Patients often can not recall when the last dose was administered
  - Due to outpatient ESA dosing regimens being every one to four weeks, reconciliation is more difficult
What are the ESA Reconciliation Opportunities?

SBHCS ESA Reconciliation Evaluation: Oncology Hypothesis

• Patients could potentially avoid an inpatient ESA dose if admitted within 14 days of receiving a long-acting ESA in the outpatient setting (Q3 week regimen)
  ▪ Prevent duplicative therapy
  ▪ Cost avoidance

Data Source

• Data Source: Health System’s billing database Trendstar®
• Time period: January to December 2006, within the entire health system
• Population: All inpatients and outpatients with a Diagnostic Related Group (DRG) for oncology with a charge for hospital-specific ESA
• Exclusion criteria:
  ▪ Patients with an inpatient LOS less than 24 hours (i.e., short stay, observation units)
  ▪ All myeloid malignancies
• Inclusion criteria:
  ▪ DRG for non-myeloid malignancies
  ▪ Medication charge code for hospital-specific ESA
### Oncology Model from SBHCS Database

<table>
<thead>
<tr>
<th>Number of patients evaluated</th>
<th>3,593</th>
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<tbody>
<tr>
<td>Mean (SD) LOS—days</td>
<td>8.1 (5.4)</td>
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<tr>
<td>Total number of doses of ESA administered during hospitalization</td>
<td>5,628</td>
</tr>
<tr>
<td>Average dose of ESA administered</td>
<td>105 (24.2) mcg</td>
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<tr>
<td>Median dose of ESA administered</td>
<td>100 mcg</td>
</tr>
<tr>
<td>Number of patients who received ESA within 14 days of admission date</td>
<td>1,636</td>
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### Oncology Model from SBHCS Database

| Number of doses avoided in first week of hospitalization | 2,557 |
| Potential percent of ESA doses avoided | 45.4% |
| Total quantity of ESA avoided | 263,278 mcg |
| Wholesale acquisition cost (WAC) | $4.82 per mcg |
| Potential dollars avoided | $1,269,000 |


### SBHCS ESA Reconciliation Evaluation: Nephrology Hypothesis

- Patients could potentially avoid an inpatient ESA dose if admitted within 21 days of receiving a long-acting ESA in the outpatient setting (Q4 week regimen)
  - Prevent duplicative therapy
  - Cost avoidance
Data Source

- Data Source: Health System’s billing database Trendstar®
- Time period: January to December 2006, within the entire health system
- Population: All inpatients and outpatients with a Diagnostic Related Group (DRG) for chronic kidney disease with a charge for hospital-specific ESA
- Exclusion criteria:
  - Patients with an inpatient LOS less than 24 hours (i.e., short stay, observation units)
  - No documented staging
- Inclusion criteria:
  - DRG for chronic kidney disease, stages 1-5 with or without dialysis
  - Medication charge code for hospital-specific ESA

Nephrology Model From SBHCS Database

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<tr>
<th>Number of patients evaluated</th>
<th>2,720</th>
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<tr>
<td>Mean (SD) LOS—days</td>
<td>7.9 (5.9)</td>
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<tr>
<td>Total number of doses of ESA administered during hospitalization</td>
<td>2,735</td>
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<tr>
<td>Average dose of ESA administered</td>
<td>94.1 (63.7) mcg</td>
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<tr>
<td>Median dose of ESA administered</td>
<td>80 mcg</td>
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<tr>
<td>Number of patients who received ESA within 21 days of admission date</td>
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Nephrology Model From SBHCS Database

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<tr>
<th>Number of doses avoided in first week of hospitalization</th>
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<tr>
<td>Potential percent of ESA doses avoided</td>
<td>90%</td>
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<tr>
<td>Total quantity of ESA avoided</td>
<td>231,507 mcg</td>
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<tr>
<td>Wholesale acquisition cost (WAC)</td>
<td>$4.82 per mcg</td>
</tr>
<tr>
<td>Potential dollars avoided</td>
<td>$1,116,442</td>
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</table>

Reconciliation of ambulatory ESA therapy upon inpatient hospital admission can result in:

1. Avoidance of unnecessary doses
2. Cost avoidance
3. Continuity of care
4. All of the above

ESA Utilization Patterns: Impact of Pharmacist Medication Reconciliation

- Retrospective descriptive study to characterize hospital-specific ESA utilization patterns in patients with chemotherapy-induced anemia (CIA) during inpatient hospital admissions
- Examined ESA medication reconciliation in patients who received outpatient ESA for anemia with chemotherapy and were then hospitalized in the SBHCS between November 2006 and January 2008

ESA Utilization Patterns: Impact of Pharmacist Medication Reconciliation

- Primary Endpoints:
  - Proportion of patients who received at least one dose of ESA
  - Total amount of ESA dispensed
  - Total number of inpatient doses
  - Utilization before and after April 2007: initiation of an ESA medication reconciliation program at SBHCS
ESA Utilization Patterns: Impact of Pharmacist Medication Reconciliation

- Secondary Endpoints
  - Pre-admission outpatient ESA utilization patterns
  - Last dose of ESA administered
  - Total number of doses
  - Days between last outpatient ESA administration and first inpatient dose
  - Days between last outpatient ESA administration and first day of inpatient admission
  - Post-discharge outpatient ESA utilization patterns
  - Amount of ESA administered
  - Total number of doses
  - Days between last inpatient dose and first post-discharge dose
  - Hemoglobin levels before ESA administration


Demographics

- Study Population:
  - N=726
  - 55% females
  - Mean age = 66 years
  - Mean LOS = 10.5 days


Results

- 85% of patients (N=616) received an ESA while hospitalized, while 15% (N=110) did not.
- For patients who received an inpatient ESA:
  - Median dose = 100 mcg per week, with most patients (86%) receiving only one dose, administered 5 days after admission
  - Previous outpatient ESA dose (median 300 mcg) was administered at a mean of 17.1 days prior to hospitalization
  - Mean LOS = 10.9 days
  - Next outpatient dose (median 300 mcg) was administered at a mean of 29.6 days after discharge
  - Mean hemoglobin level before post-discharge ESA administration = 9.95 g/dL

Results

- For patients who did not receive an inpatient ESA:
  - Previous outpatient ESA dose (median 500 mcg) was administered at a mean of 10.8 days prior to hospitalization
  - Mean LOS = 8.3 days
  - Next outpatient dose (median 300 mcg) was administered at a mean of 30.1 days after discharge
  - Mean hemoglobin level before post-discharge ESA administration = 9.86 g/dL

Results

- Outpatient ESA Schedule (all patients)
  - Outpatient schedules:
    - Every 1 week: 5%
    - Every 2 weeks: 59%
    - Every 3 weeks: 36%


Inpatient ESA Dose Avoidance Group

1% 30%
69%

Which of the following ESA outpatient dosing frequency offers the greatest opportunity for inpatient dose avoidance?

1. Weekly
2. Every two weeks
3. Every three weeks
4. Three times a week

Implementation of an ESA Continuum of Care Program
Do you currently have a system in place to track outpatient administration of ESAs and inpatient ESA dose avoidance, “an ESA continuity of care program”?

1. Yes
2. No

If you answered ‘Yes’ to having a continuity of care program, is your process:

1. Manual
2. Electronic
3. Both
4. Neither

Implementation of an ESA Reconciliation Program

- Identify the opportunity
- Develop the plan
- Implement the plan
- Measure success of the initiative
- Sustain the gains
Identify the Opportunity

• ESA Utilization Patterns
  ▪ Outpatient (frequency of administration)
    ▪ Oncology
    ▪ Nephrology
  ▪ Inpatient (date of last outpatient ESA administration)

Determining Frequency of Outpatient ESA Administration

• Outpatient Clinic
  (Hospital owned)
  ▪ Electronic file
  ▪ Sample chart abstraction

• Physician’s office
  ▪ Interview with physician, office staff
  ▪ Electronic file
  ▪ Sample chart abstraction
  ▪ 80/20 Rule
  ▪ Feeder physicians
  ▪ Often a small number of offices

Questions to Ask

• Total number of inpatients receiving ESA therapy
• Total number of ESA doses administered during hospitalization
• Average dose of ESA administered
  ▪ Ensure inpatient dose is consistent with current protocol
• Total number of inpatients who receive a dose of ESA with 14 days (oncology) and 21 days (nephrology) prior to admission
• Number of ESA doses avoided during the first week of hospitalization
• Total number of ESA (units/mcg) avoided during first week of hospitalization
**Develop the Plan**

- Modify the existing system to enhance communication
- Develop a standardized process for obtaining a medication history, particularly in regard to ESA dosing
  - Electronic
  - Manual
- Ensure that ESA dosing information is reviewed before filling an order for ESA

**Modify Existing System**

- Does your current process for reconciliation capture medications with extended dosing frequency?
- Is this information communicated to the pharmacy department?
  - If yes, schedule next dose accordingly
  - If no, develop process to obtain information

**Electronic Solution**

- Real time through integrated clinical information system
- Utilization of real time query through secondary computer system
- Utilization of electronic weekly report from outpatient clinic/office
Manual Solution

- Telephone Query
  - Outpatient clinic (facility owned)
  - Physician office
- Process initiated by:
  - Support personnel
- Determine date of last ESA outpatient administration

Review of Order

- Pharmacist review order and date of last administration
- Pharmacist review of hemoglobin
  - Auto discontinuation for hemoglobin target
- Schedules dose accordingly
- Computer warning should appear if it is too early for medication administration

Implementing the Plan

- Educate staff regarding the new policy via training and publications
  - Pharmacists
  - Technicians
  - Outpatient clinics
  - Physician’s offices
- Educate the patient
Documentation

- Manual communication form
- Clinical information system
- Pharmacy intervention system
- Dose avoided and cost

Measure Success of the Initiative

- Conduct a medication use evaluation (MUE) to assess ESA utilization before and after implementation of the initiative
  - Following implementation of the initiative:
    - Has inpatient ESA dose avoidance improved?

Sustain the Gains

- Periodically re-educate about the importance of ESA reconciliation, to ensure that the initiative maintains traction
- Continue to track outcomes to demonstrate positive effects associated with ESA reconciliation
In Summary…

- One of the Joint Commission’s NPSGs for 2008/2009 is/was to accurately and completely reconcile medications across the continuum of care.
- Appropriate medication management can help to bridge gaps in continuity of care, thereby reducing medication errors and improving patient care.
- Maintaining an ESA dosing regimen between the outpatient and inpatient settings is important to prevent fluctuations in hemoglobin level and unnecessary therapeutic duplications, as well as to reduce hospital costs.
- Health care facilities wishing to implement an ESA continuum of care program need to identify the gap, develop an improvement strategy, implement the plan, measure the success of the initiative, and sustain the gains.

Thank You