The Discharge Assistant: Facilitating Information Transfer at Hospital Discharge

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Adverse events are common when patients transition from hospital to outpatient care¹

• **19-23%** of patients experience adverse events within 4 weeks after acute care hospitalization

• Ineffective communication contributed to many of the preventable adverse events

• Discharge communication should include **specific information**:
  - The new discharge medication regimen
  - What follow-up physicians need to do
  - When they need to do it
  - What they should watch for
  - *And* more effort must be made to effectively communicate this information to the patient

Miscommunication about Medications is a Common Cause of Many Adverse Events

66% of adverse events identified by Forster, et al. were adverse drug events¹

Following hospital discharge²:
- 64% of elderly patients have at least one medicine not ordered by the discharging physician
- 73% of patients fail to use at least one medicine as directed
- 32% of drugs ordered at discharge are not used by the patient

Integration of admission medications, in-hospital changes, and discharge medications on a single form increases the conformity rates of community pharmacy patient profiles after hospitalization³

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The most common form of information transfer is the structured discharge summary\textsuperscript{1,2}

Information is not received in a timely fashion…

- arrive, on average, 2-4 weeks after hospital discharge
- 66-92\% of patients visit their outpatient physicians before complete discharge information is available
- Between 16 and 53\% of patients contact their outpatient physician before arrival of any discharge information

…and for 51\% of patients, the discharge summary is \textit{never sent} to the follow-up physician

\textit{When discharge communication is delayed or insufficiently detailed, post-discharge management is adversely affected for 10-14\% of patients}

Immediate Discharge Documents

Facilitated timely communication…
- 60% were received within 5 days

…but information was often incomplete
- 13% omitted a main diagnosis or condition
- Only 28% had clear F/U plans
- Only 12% stated whether further test results were pending
- 41% specified who to contact if further information was needed

and the signature was legible in only 39%

Current Process

Discharging Physician

Clerk

Patient

PCP (+/- Consultants)
The Challenge

Use an evidence-based approach to redesign our current process to facilitate information transfer between providers at the time of hospital discharge in a more reliable, legible, complete, and timely fashion.
Application Requirements

- immediate utility,
- minimal development and deployment costs,
- acceptable to users and readily modifiable based on user feedback,
- support quality and educational assessment audits, and
- might assist in the identification of additional functions and features desirable in this and other discharge software applications.
Design Specifications

Creation of legible documents including:

- Prescriptions for medications, diet, activity, and self-care behaviors
- Instructions for patients about followup diagnostic tests and appointments, including dates and addresses
- Correspondence to outpatient physicians which would contain all pertinent information necessary for follow-up care

Use of prompts and basic error checks to improve the completeness and quality of the documents

Emphasize speed of data entry and ease of use by:

- Minimizing text entry by making extensive use of drop-down menus, option boxes and check boxes
- Designing logically presented screens which conformed as much as possible to currently used forms and workflow patterns
- Designing search algorithms which would allow flexible yet efficient lookups.
Log in as Doogie Howser, M.D.


OPTIONAL:
This section can be used for additional information which should be communicated to the referring physician prior to receipt of the discharge summary (e.g., STUDIES PENDING AT THE TIME OF DISCHARGE, PERTINENT PROCEDURES, STUDIES, AND RESULTS, etc.). Additions to this section are intended for the referring physician only and will not be included in instructions to patients. Since this information will be included verbatim in a letter to the referring physician, please USE COMPLETE SENTENCES AND PROPER SPELLING AND GRAMMAR. (This field will be checked for misspellings prior to printing.)

Patient presented with chest pain. MI was ruled out and stress echo showed no evidence of ischemia. Ejection fraction was 40%. It was felt that GERD was the likely etiology.

Designate all doctors who shared PRIMARY responsibility for this patient's care during this hospitalization:

Residents:

Resident who cared for patient:

Consultants:

Consultants who cared for patient:

Harvey, RD (Internal Medicine-Hospitalist)

* A summary will be sent to each consulting physician.

Send additional copy to: OK

Additional copies will be sent to:

Click here when finished to print documents  Preview Reports  Save for completion later  DELETE record and exit
NEW DRUG ALLERGIES IDENTIFIED THIS ADMISSION: NO NEW DRUG ALLERGIES IDENTIFIED DURING THIS ADMISSION

ATTENTION PHARMACIST - PLEASE FILL THE FOLLOWING PRESCRIPTIONS:

PANTOPRAZOLE SODIUM (PROTONIX®) EQ 40MG BASE TABLET, DELAYED RELEASE
Disp: #30 with 1 refill (generic substitution allowed)
Sig: One by mouth each day

(Note to pharmacist: this is a NEW PRESCRIPTION)

SULFAMETHOXAZOLE; TRIMETHOPRIM (BACTRIM DS®) 800MG;160MG TABLET
Disp: #20 with 0 refills (generic substitution allowed)
Sig: One by mouth twice daily

(Note to pharmacist: this is a NEW PRESCRIPTION)

CARVEDILOL (COREG®) 6.25MG TABLET
Disp: #60 with 3 refills (generic substitution allowed)
Sig: One by mouth twice daily

(Note to pharmacist: this is a currently prescribed medication with CHANGE IN DOSE &/OR FREQUENCY)

ATTENTION PHARMACIST - The following medications are to be DISCONTINUED:

MAALOX SUSPENSION

(Note to pharmacist: this medication is to be DISCONTINUED)

Physician Signature ____________________________ DEA # XX123456 Date: 10/22/2005
Doogie Howser, M.D. (phone: 309-655-7257)
1. Discharge patient.

2. Please include the following medication information on the Medication Discharge Instructions/Transfer Order form (Form No. 113-561):

   - Allergies noted on this hospitalization: NO NEW DRUG ALLERGIES IDENTIFIED DURING THIS ADMISSION

NEW MEDICATIONS:

- **PANTOPRAZOLE SODIUM** 40mg base tablet delayed release one by mouth each day Drip: 100ml in 500ml Dextrose 5% (IV only allowed)
- **CUMAMETHODRAMOLE: TRIMETHOPRIM & SULFAMETHOXAZOLE** 160mg/800mg tablet one by mouth each day Drip: 500mg in 500ml Dextrose 5% in 500mg Drip (IV only allowed)

Previous medications with CHANGES IN Dose or FREQUENCY

- **CARVEDILOL (COREG)** 6.25mg tablet one by mouth twice daily Drip: #60 with 3 ml H2O (IV only allowed)

DISCONTINUED medications

- **NALOXONE** responsive

3. Provide a copy of the following information to the patient at discharge:

   - INSTRUCTIONS:
     - Do not smoke.
     - Use some oxygen at 2 liters per minute continually, NEVER USE OXYGEN NEAR AN OPEN FLAME.
     - Return to work in 1 week.

   - FOLLOW-UP APPOINTMENTS:
     - Within 2 weeks due to be scheduled by patient
     - Dr. R. R. MD
     - OSF Medical Group
     - 330 NE Glendale Ave
     - Peoria, IL 61617
     - 309-634-5750

   - FOLLOW-UP STUDIES:
     - Physician Signature __________________________ ID #: __________ Date: __________
     - Dr. H. H. M.D.

**PHYSICIAN ORDERS**
October 22, 2005
Dr. John Doe
510 N.E. 10th Ave.
P.O. Box 207
St. Louis, MO 63101

Dear Dr. Doe:

Your patient John Doe was admitted to OSF Saint Francis Medical Center on 10/22/2005, and was discharged from the University Hospital and Teaching Service on 10/24/2005. The following is a summary of the patient's diagnosis, medications changes, and discharge instructions pertinent to the hospital stay.

DISCHARGE DIAGNOSIS:
Chest pain, ECG positive for ischemia
Hypertension, lab values 140/90 (12/14)
Hypothyroidism, baseline TSH level 10.1

NEW MEDICATIONS IDENTIFIED DURING THIS ADMISSION:
CARVEDILOL 12.5MG PO BID (new)

DISCHARGE MEDICATIONS:
NEW MEDICATIONS
PANTOPRAZOLE NATE: 40MG DUO/BE TABLET QD
PANTOPRAZOLE NATE: 40MG BASE TABLET QD

DISCONTINUED MEDICATIONS
AMLODIPINE BESATE 10MG PO QD

Please review the patient's medications and adjust as necessary.

Sincerely,
C. Stephen Nace, M.D.
Assistant Professor of Clinical Medicine

Assistant of OSF Medical Center

501 N.E. 3rd Ave.
P.O. Box 162
P.O. Box 207
St. Louis, MO 63101

855.373.OSF1

OSF Medical Center

501 N.E. 3rd Ave.
P.O. Box 162
P.O. Box 207
St. Louis, MO 63101

855.373.OSF1
OSF Saint Francis Medical Center - Peoria
Date of Discharge: 10/21/2005

Instructions and Appointments for John J Doe (DOB: 11/11/1922)

INSTRUCTIONS:
Diet: low fat.
Use home oxygen at 2 liters per min continually. NEVER USE OXYGEN NEAR AN OPEN FLAME.
Return to work in one week.

FOLLOW-UP APPOINTMENTS:
When: 2 weeks (is to be scheduled by patient)
Sara Rusch MD
OSF Saint Francis Medical Center
530 NE Glen Oak Ave
Peoria, IL 61637
(309) 655-2730

FOLLOW-UP STUDIES:
BLOOD WORK 2 weeks at outpatient physician's office (is to be scheduled by patient)
PCP and Consultants

Patient

Rx and F/U instructions to patient

Copies printed and filed in patient chart at discharge

Discharging physician

Backend server

Attending proofreads summary letter

Attending Physician

Secretary

PCP and Consultants

Distribution
Time Study – Initial Results

- Discharges N = 358
- Population [mean (ranges)]:
  - LOS = 5.1 days (1, 58)
  - # of diagnoses = 7.6 (1, 25)
  - # of medication directions* = 9.8 (1, 34)
  - words of free text entered = 99 (0, 592)
- Users N = 25
  - 23 residents, 2 attendings
- Median time per discharge = 36 minutes (9, 209)

* Includes new rx’s, changes in existing medications, medications from before admission which are to be continued without change, and discontinued medications
What Have We Learned So Far?

- The new process results in information transfer which is:
  - More reliable,
  - More legible,
  - More timely, and
  - More complete.
- Referring physicians like the new process.
- Output is helpful to have with early re-admissions.
- Discharging residents are mixed in their reviews:
  - Major complaint is that it takes too much time...
  - ...but they like it when they are on the receiving end
Vision

- Alternate reference databases (e.g., SNOMED, NDC)
- Alternate distribution mechanism (fax server +/- secure email)
- Incentives for use (e.g., substitute for a dictated summary)
- Web-based platform
- Integration with EHR
- Incorporation within EHR
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