Standardized or narrative discharge summaries

Which do family physicians prefer?

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ABSTRACT

OBJECTIVES To determine whether family physicians prefer discharge summaries in narrative or standardized format and to determine factors affecting this preference.

DESIGN Mailed survey.

SETTING Internal medicine ward at a teaching hospital.

PARTICIPANTS Random sample of 180 family physicians practising in the Ottawa-Carleton area. Of the original sample, 20 were not family physicians and were excluded. Of the 160 physicians remaining, 126 responded for a response rate of 78.8%.

INTERVENTION For a stratified random sample of patients, medical records and narrative discharge summaries were abstracted using a data acquisition form to capture essential information. Information on completed forms was transformed into standardized summaries. Physicians were sent both narrative and standardized summaries.

MAIN OUTCOME MEASURE Physicians' format preference as indicated on an ordinal 7-point scale.

RESULTS The standardized format was preferred with a score of 4.28 versus 3.84 for the narrative ($P < .05$). Responses indicated the standardized format provided information most relevant to ongoing care, with a mean score of 4.82 (95% confidence interval [CI] 4.48 to 5.15), and easier access to summary information (5.60, CI 5.30 to 5.89). The narrative summary better described patients' admission (3.54, CI 3.18 to 3.90). Preference for standardized summaries correlated with lengthier narrative summary ($P<.05$), shorter length of stay ($P<.05$), and physicians' dissatisfaction with previous summaries ($P<.001$). Standardized discharge summaries were significantly shorter (302 versus 619 words, $P=.004$) than narrative summaries.

CONCLUSIONS Physicians preferred a standardized format for discharge summaries. Format preference is influenced by physician, patient, and discharge summary characteristics.

RÉSUMÉ

OBJECTIFS Déterminer dans quelle mesure les médecins de famille préfèrent les résumés de départ dans un format narratif ou dans un format structuré standardisé et préciser les facteurs qui affectent cette préférence.

DEVIS Sondage postal.

MILIEU Unité hospitalière de médecine interne d'un centre hospitalier d'enseignement.

PARTICIPANTS Échantillon aléatoire de 180 médecins de famille exerçant dans la région Ottawa-Carleton. À partir de l'échantillon original, 20 médecins furent exclus parce qu'ils n'étaient pas médecins de famille. Parmi les 160 autres, 126 ont répondu pour un taux de réponse de 78,8 %.

INTERVENTION À partir d'un échantillon aléatoire stratifié de dossiers médicaux, on a résumé le dossier et les notes de départ narratives en utilisant un formulaire d'extraction des données pour saisir les renseignements essentiels. L'information ainsi obtenue fut ensuite transformée en résumés structurés standardisés. Les médecins ont reçu les résumés dans les deux formats : narratif et standardisé.

PRINCIPALE MESURE DES RÉSULTATS Préférence des médecins quant au choix du format mesurée par une grille ordinale en sept points.

RÉSULTATS Le format standardisé a reçu la préférence (4,28 *vs* 3,84 pour le format narratif ; $p<0,05$). Les réponses indiquent que le format standardisé contribue les renseignements les plus pertinents pour le suivi des soins avec une cote moyenne de 4,82 (intervalle de confiance [IC] à 95 %, de 4,48 à 5,15) et un accès plus facile aux notes de départ (IC à 95 %, de 5,30 à 5,89). Par contre, le résumé narratif décrit mieux l'admission du patient (cote de 3,54, IC à 95 %, de 3,18 à 3,90). On a établi une corrélation entre la préférence pour les résumés structurés standardisés et la longueur des résumés narratifs ($p<0,05$), la durée de séjour plus courte ($p<0,05$) et l'insatisfaction des médecins envers les anciennes notes de départ ($p<0,001$). Les résumés structurés furent significativement plus courts (302 mots *vs* 619 ; $p<0,004$) que les résumés narratifs.

CONCLUSIONS Les médecins préfèrent recevoir les notes de départ sous forme de résumé structuré standardisé. Cette préférence est influencée par le médecin, le patient et les caractéristiques particulières du résumé de départ.

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When hospital care is provided by physicians other than a patient's family doctor, information necessary for continuing care must be communicated. This usually is accomplished through a discharge summary.[1] Deficiencies in the content of, and in the process used to create, discharge summaries have been documented.[2] Improving discharge summaries would be one way to address this problem.

Standardizing discharge summaries could produce more complete summaries[3,4] with less labour.[5-7] A standard discharge summary format might improve the accuracy of information in discharge databases[8] and could ease the integration of computer databases into discharge summary generation.[9-12] Standardization has improved the quality of journal abstracts[13,14] and has been advocated for study proposals[15] and for reporting randomized trials.[16] Although the call for increased standardization of discharge summaries dates back more than 20 years,[17] most summaries use a narrative, loosely structured format. No studies have directly compared narrative and standardized summaries for adult patients with multiple medical problems, such as those discharged from internal medicine wards.

We believe the primary purpose of a discharge summary is to transfer information necessary for continuing care. It must be acceptable, therefore, to primary care physicians. Our survey's objectives were to compare family physicians' preference for narrative or standardized discharge summaries for patients admitted to a general medicine service and to elicit factors that affect the acceptance of standardized summaries.

METHODS

Sampling frame and standardized summary generation

The internal medicine service at the Ottawa Civic Hospital is composed of four physician teams, headed by a staff internist and senior medical resident, and including a varying number of interns and medical students. At the time of the study, approximately 60% of inpatient medical care was delivered by the service. House staff prepared most of the discharge summaries; medical students and interns received guidelines on content for discharge summaries from the medical records department.

All narrative discharge summaries for patients discharged from the service during February 1995 were eligible for the study. To ensure inclusion of a range of summaries, four parameters potentially affecting summary quality were determined for each case: patient's length of stay, physician's level of training, summary length, and number of International Classification of Diseases (ICD) diagnoses at discharge. The upper and lower quartiles of each parameter were determined and summaries were excluded if more than one of the four parameters fell outside the middle quartiles. One summary from each parameter's upper and lower quartile was randomly chosen along with a summary with all four parameters within the middle quartiles. This process resulted in nine original summaries in narrative format (**Figure 1**) that allowed us to determine each parameter's effect on summary quality independently. The physicians who dictated the narrative summaries were unaware of our study.

Following a review of the literature,[1,18-21] information felt to be essential to a discharge summary was determined and a data abstraction form (available from the authors on request) was created. Two physicians independently completed data abstraction forms by reviewing the nine original summaries and the medical records. Data abstraction forms were then used to produce two groups of standardized discharge summaries (**Figure 2**) that could be compared with the narrative summaries.

Sample and survey methods

Equal proportions of the nine summary pairs (narrative and standardized) were assigned to physicians randomly sampled from a list (supplied by the Ontario Medical Association) of 508 local general practitioners and family physicians. Randomization determined the order of the summaries in the survey and which of the two standardized summaries (ie, prepared by CvW or SD) was included. All patient, physician, and institutional unique identifiers were removed. Responses to a questionnaire determined whether physicians surveyed provided continuous care to patients (our definition of "family practitioner" for the study) and indicated attitudes toward summaries received previously.

Physicians were asked to indicate which summary (narrative or standardized) provided the easiest access to information, the best description of the

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Figure 1. Discharge summary for one admission using narrative format:
Unique identifiers have been removed.

ADMISSION DIAGNOSIS: Anemia

DISCHARGE DIAGNOSIS: Upper GI bleed

HISTORY OF PRESENT ILLNESS: Patient is a 78-year-old woman from _____, living in a senior's residence. She has a history of DVTs and has received warfarin (Coumadin) for 2 years. In addition, she underwent a right knee replacement for osteoarthritis 3 weeks before this admission, and her hemoglobin level on discharge was 96. The patient was generally well until 3 days before admission when she started experiencing malaise, fatigue, and decreased appetite. She reported only one episode of melena stools occurring 5 or 6 days before admission. The patient was found to have a high INR at her residence by her family physician and was sent to the hospital emergency for evaluation.

MEDICAL HISTORY: The patient's medical history indicates a DVT 2 years ago, as well as right-sided stroke 2 years ago. She also has diverticulitis, osteoarthritis, and apparently cured uterine cancer.

MEDICATIONS ON ADMISSION: Conjugated estrogens (Premarin), warfarin (2.5 mg alternating with 5 mg every other day). It is unclear why the patient receives long-term warfarin therapy; course of 6 months is usually appropriate after a single episode of DVT. Other medications included captopril (eg, Capoten) (12.5 mg by mouth bid), diazepam (Valium) (5 mg bid as needed), temazepam (Restoril) nightly as needed.

PHYSICAL EXAMINATION: On examination, the patient was in no apparent distress, well hydrated, alert, and oriented. Blood pressure was 150/80 mm Hg, with no postural drop, and heart rate was 87 and regular. Respiratory rate was 12, and the patient was afebrile. Head and neck and respiratory examinations were both within normal limits. Cardiovascular examination was normal, except for a grade 2/6 systolic ejection murmur, maximum at the lower left sternal border. Abdominal examination revealed normal bowel sound with a soft, nontender abdomen, no masses, no hepatosplenomegaly, no ascites, no guarding, and no rebound tenderness. Digital rectal examination revealed no masses, but did contain dark, soft stool, which was not tested for occult blood. Neurological examination was within normal limits.

LABORATORY DATA: Laboratory data on admission revealed a hemoglobin level of 67 with an MCV of 87. White blood cell count was also elevated at 17.9 with a left shift. Electrolytes were within normal limits, but the patient did have a coagulopathy with an INR of 8.0 and a PTT of 65. A CBC done 3 weeks before admission showed a hemoglobin level of 96 and a WBC of 10.7. A urine dip revealed large blood and moderate leukocyte contents. Electrocardiogram done at the time of admission was normal.

COURSE IN HOSPITAL: The patient was admitted to hospital and transfused with two units of packed red cells. Her warfarin therapy was stopped, and she was given vitamin K subcutaneously to correct her coagulopathy. The patient was also started on ciprofloxacin for her presumed urinary tract infection. We consulted our GI service on the site of the patient's bleed; they believed that her bleeding was secondary to her high INR; as such, an upper GI bleed was possibly secondary to gastritis or an ulcer. We decided not to scope this lady at this time. By February _____, the patient's INR had been corrected and her hemoglobin level had stabilized around 90. The patient was experiencing no further *Monilia* and no postural dizziness at the time of discharge.

MEDICATIONS ON DISCHARGE: conjugated estrogens 0.625 mg by mouth daily, captopril 12.5 mg by mouth bid, docusate (Colace) 100 mg by mouth bid, ranitidine (Zantac) 150 mg by mouth bid, ferrous gluconate 300 mg by mouth tid, temazepam (Restoril) 2.5 mg by mouth nightly as needed, diazepam 5 mg by mouth bid as needed.

FOLLOW-UP ARRANGEMENTS: The family physician is to monitor hemoglobin every 2 weeks for 6 weeks. Dr _____ will follow up in the internal medicine clinic in 2 weeks.

Figure 2. Discharge summary for one admission using standardized format:
Unique identifiers have been removed.

PREADMISSION DATA

ADMITTING DIAGNOSIS: Fatigue and shortness of breath x 3 days.
Melena x one episode.

ACTIVE MEDICAL PROBLEMS:
1. Previous DVT
2. Osteoarthritis with a left total knee arthoplasty in 1994 and a right total knee arthoplasty in January 1994
3. Diverticulitis diagnosed in 1994
4. Stroke in 1993
5. UTI x 1 week being treated with sulfamethoxazole and trimethoprim (Septra)
6. Hypertension treated with captopril (eg, Capoten) 12.5 mg bid

HOSPITAL DATA

PERTINENT POSITIVE OR NEGATIVE FINDINGS ON PHYSICAL EXAMINATION:
Patient was pale
Vital signs: normal with no orthostatic drop
Chest: normal
Cardiovascular examination: 2/6 systolic murmur that radiated to carotids bilaterally
Abdomen: normal with no blood on rectal examination

IMPORTANT LABORATORY INFORMATION:
Hematology: WBC 17.9, hemoglobin level 67 with hemoglobin of 96 on previous discharge. MCV was 84, INR 8.0, PTT 55. Blood smear revealed hypochromic cells with slight microcytosis.
Microbiology: Urine cultures grew > 10^9 *E coli*/L sensitive to ampicillin.
Other: positive fecal occult blood testing; urinalysis showed large amount of blood. ECG showed normal sinus rhythm with flipped T-waves in V_5 and V_6, I and aVL. Ferritin was 29 and serum iron was 4.

TREATMENT AND THERAPEUTIC PROCEDURES GIVEN IN HOSPITAL:
1. Vitamin K 1 mg subcutaneous x 1
2. Four units packed red blood cells
3. Ciprofloxacin 500 mg bid x 6 days

CONSULTATIONS AND THEIR CONCLUSIONS:
1. GI: GI bleed was secondary to the high INR. There was no need for endoscopy.

DISCHARGE DATA

MOST RESPONSIBLE DIAGNOSIS: GI bleed secondary to high INR
OTHER DIAGNOSES INFLUENCING LENGTH OF STAY: UTI secondary to *E coli*
DISCHARGE MEDICATION:
1. Conjugated estrogens (Premarin) 0.625 mg once daily
2. Captopril (eg, Capoten) 12.5 mg bid
3. Ranitidine (Zantac) 150 mg bid
4. Docusate (Colace) 100 mg bid
5. Ferrous gluconate 300 mg tid
6. Temazepam (Restoril) 2.5 mg nightly as needed
7. Diazepam (Valium) 5 mg bid

MEDICAL FOLLOW-UP:
1. Family MD to check hemoglobin every 2 weeks x 6 weeks
2. Internal medicine clinic in 2 weeks

PROBLEMS NEEDING ADDRESSING:
1. Monitor hemoglobin.
2. Assess continuing need for diazepam and ranitidine.

Table 1. Patient characteristics: Details from the charts of the nine patients selected

EXCEPTIONAL PARAMETER	AGE	SEX	ACTIVE MEDICAL PROBLEMS
Short stay	63	M	Congestive heart failure secondary to doxorubicin (Adriamycin) administration, Chronic lymphatic leukemia Richter's syndrome
Long stay	73	F	Upper gastrointestinal tract bleeding secondary to warfarin (Coumadin) therapy Unspecified coagulation defect Iron deficiency anemia
Few diagnoses	62	M	Upper GI bleeding secondary to duodenal ulcer
Many diagnoses	77	M	Closed head injury Closed clavicle fracture Closed rib fracture Pneumonia
Physician's low training level	70	F	Pneumonia Hyponatremia Hypokalemia
Physician's high training level	69	F	Pneumonia Chronic obstructive lung disease Alzheimer's disease
Short narrative record	82	F	Pneumonia Congestive heart failure Urinary tract infection
Long narrative record	65	M	Deep vein thrombosis Pulmonary embolism Thrombocytopenia
All parameters normal	67	F	Tricyclic antidepressant poisoning Schizophrenia Suicide attempt

patient's admission, and the information most relevant to continuing care. An ordinal 7-point scale, anchored in the middle and at both ends, was used for all ratings. We assumed physicians preferred the summary they rated higher. Space was provided for comments. Physicians not responding within 3 weeks were sent another questionnaire. Nonresponders to the second questionnaire were contacted by phone to determine their specialty and whether they would complete a questionnaire if another were sent.

Sample size calculation and ethics review

The study's primary outcome was overall preference for a summary format and was used for sample size calculation. We assumed a mean score of 4 (with an SD of 3) for narrative summaries. With an α error of .05, and a β error of 0.2, 100 responses allowed a mean difference of 0.85 to be detected in the score. Because standardization of summary format could have other advantages, we thought that even a relatively small improvement would be important. Assuming a 70% response rate and that 20% of respondents would not be practising family physicians, we estimated that 180 physicians would need to be surveyed.

The Chair of our institutional ethics review board determined that neither patient nor physician confidentiality was breached by the study since summaries described cases of relatively common disorders and all unique identifiers were removed.

Statistical analysis

All statistical analysis was done using BMDP New System for Windows, Version 1. Difference in format preference was measured with Student's paired *t* test. The effect of summary format on summary attributes was measured with the one-group *t* test. Correlation between ordinal data was measured with the Spearman Rank Correlation test. For correlation analysis, the starting year of practice was categorized into quintiles. Format preference trends over the three levels (highest, middle, and lowest quartiles) of each summary parameter (patient's length of stay, physician's level of training, summary's length, and case complexity) were measured with the χ^2 test for trends. An α probability of .05 designated significance for all statistical tests.

Table 2. Details of the nine patient summaries

PARAMETER OUTSIDE MIDDLE QUARTILES	LENGTH OF STAY (D)	NO. OF ICD-9 DIAGNOSES	PHYSICIAN'S TRAINING LEVEL*	RECORDING TIME (MIN)†
Short stay	3	3	MS-4	8.6
Long stay	9	3	PGY-1	9.9
Few diagnoses	4	1	PGY-1	6.1
Many diagnoses	6	6	MS-4	9.9
Physicians' low training level	7	3	MS-3	5.6
Physicians' high training level	5	3	PGY-2	7.8
Short recording time	5	3	Staff	4.4
Long recording time	7	3	MS-4	18.2
All parameters normal	4	3	PGY-1	6.4

ICD – *International Classification of Diseases–9,* MS – *medical student,* PGY – *program year.*

**Because summary length and physician training level were highly correlated, no summaries with a lowest quartile length were dictated by physicians with a median training level; a summary with a lowest quartile length dictated by a physician with a highest quartile training level was substituted.*

†*Recording time is highly correlated with number of words in the summary ($R^2 = 0.81$, P <.0001 in a random sample of 50 summaries).*

RESULTS

Discharge summary sample

During the study month, 191 patients were discharged from the service. Median length of stay was 5 days (interquartile range [IQR] 3 to 8), median number of discharge diagnoses was three (IQR two to four), and median training level of physicians was first-year postgraduate (IQR third-year medical student to second-year postgraduate). **Table 1** shows characteristics of the nine patients chosen; **Table 2** gives parameter values for their summaries.

Response rate and physician characteristics

Of the 180 physicians sampled, 20 (11.1%) were not family doctors and were excluded. Response rate of the remaining 160 was 78.8% (126 family doctors); 98.9% of questionnaire fields were completed. Responding physicians had been in practice a mean of 15 years (IQR 5 to 21) and usually received a median of 16 to 20 summaries (IQR 6 to 10, >20) from internal medicine services at teaching hospitals, which they gave an overall mean rating of 4.33 (95% CI 4.15 to 4.52).

Format comparison

Because the only significant difference between them was the rating for the description of patients' admission, the two standardized summary groups were combined for comparison with narrative summaries. Mean score for standardized summaries (4.28; 95% CI 3.99 to 4.58) was significantly higher than for narrative (3.84; 95% CI 3.55 to 4.13; $P=.04$ paired t test; **Table 3**). Although 21 (16.7%) physicians had no preference, significantly more physicians preferred the standardized format (68 [53.9%] versus 37 [29.4%]). Standardized summaries provided information most relevant to continuing care ($P<.0001$) and easier access to that information ($P<.0001$). Narrative better described patient's admission ($P=.03$). Standardized summaries were significantly shorter (317 versus 619 words; $P<.005$, paired t test).

Format preference modifiers

Preference for standardized summaries increased as the quality rating of previously received summaries decreased ($P<.001$, Spearman Rank Correlation), as the length of the narrative summary increased, and as the patient's length of stay decreased ($P<.05$, χ^2 for trend). Other respondent (time in practice, number of summaries received per year) and summary (number of discharge diagnoses, physician's level of training) characteristics did not affect summary preference.

Table 3. Comparison of summary formats: *On a 7-point scale, a score lower than 4 indicates preference for the narrative format and above 4 indicates preference for the standardized format*

SUMMARY ATTRIBUTES*	MEAN (95% CI)	P VALUE
Provides easiest access to information	5.53 (5.19-5.87)	<.0001†
Best describes patient's admission	3.54 (3.18-3.90)	.03‡
Provides information most relevant to continuing care	4.82 (4.48-5.15)	<.0001§
SUMMARY PREFERENCE	**SCORE (RANGE)**	
Overall rating of narrative format	3.84 (3.55-4.13)	.04¶
Overall rating of standardized format	4.28 (3.99-4.57)	NA

**Significance was determined using a one-group* t *test with a hypothetical mean of 4.0.*
†Value 10.6, df *123, one-group* t *test.*
‡Value -2.50, df *123, one-group* t *test.*
§Value 4.79, df *124, one-group* t *test.*
¶Value -2.07, df *122, paired* t *test for comparison of narritive and standardized formats.*

DISCUSSION

To our knowledge, this is the first study directly comparing physician preference for discharge summary format for general internal medicine patients. Standardization resulted in notably shorter discharge summaries, which were preferred by those surveyed. Physicians thought the standardized summaries were better overall and contained more relevant information that was more easily accessible. The standardized format was especially preferred when the narrative summary was lengthy, the patient's length of stay was short, and the physician thought the discharge summaries previously received were of poor quality. Preference for the standardized format applied to a range of patient conditions.

Other studies have shown that family physicians preferred structured over narrative discharge summaries[10] because it was easier to abstract information from them and because they provided more relevant information for continuing care. In a British survey, 88% of general practitioners preferred shorter, structured discharge summaries.[22] Howard[7] found that 92% of responding family physicians thought structured summaries of geriatric patients' particulars were an improvement over narrative letters.

Strengths

This study's strengths include its high response rate, the randomized selection of family physicians, and inclusion of only physicians classifying themselves as family doctors. Thus, the opinions in our survey likely represent accurately those of family physicians practising in our region. Finally, stratified sampling of narrative summaries allowed us to test the standardized format on a range of summaries.

Limitations

Preference could have been biased toward the standardized summary because study physicians had more medical training (PGY-2 and PGY-5) than most physicians dictating narrative summaries. They also might have prepared the summaries more carefully knowing they were part of the study.[23] Although study physicians had access to the narrative summaries that encapsulated admission information, they had no previous knowledge of the patients and relied on patient records, a source with some flaws,[24] for all information. Physicians rated each summary assuming they had to continue the patient's care. If physicians *actually had* to follow these patients, however, they might prefer narrative summaries over briefer, standardized summaries. Although interobserver variation in summary assessment was decreased by having physicians compare narrative and standardized summaries directly, the shorter standardized format might have been preferred because it was supplemented by the narrative summary.

Although changing the discharge summary's format resulted in a statistically significant improvement in its quality rating, the clinical importance of this change could be limited. Many responding physicians commented that a summary's usefulness is mainly influenced by how quickly they get it.[25]

Key point
Structured hospital discharge summaries for internal medicine patients provided more information relative to ongoing care, permitted easier access to that information, and were shorter than traditional narrative summaries. Family physicians preferred structured discharge summaries.

Standardization might facilitate summary generation because it eliminates deciding which content categories to include.[5,7] At present we are testing this hypothesis with a randomized controlled trial.

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