A physician-centred intervention to shorten hospital stay: a pilot study

Education

Éducation

John C. Setrakian,* MD CM; Kenneth M. Flegel,* MD CM, MSc; Tom A. Hutchinson,*† MB; Sylvie Charest,‡ BRn, MAHA; Linda Côté, AMA;‡ Michael D. de B. Edwardes,† PhD; Irene B. Corbett,§ RN

From the Departments of *Medicine, †Clinical Epidemiology, ‡Quality, Risk and Utilization Management, and §Nursing, Royal Victoria Hospital, McGill University Health Centre and McGill University, Montreal, Que.

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Abstract

Background: Studies of length of stay (LOS) in hospital usually focus on physician-independent factors. In this study, the authors identified physician-dependent factors and tested an intervention aimed at them to determine its effect on LOS.

Methods: A prospective comparison of LOS on 2 general medical wards in a tertiary care teaching hospital before and after the intervention. The pre-intervention (control) period and the intervention period were each 4 weeks. The intervention consisted of a checklist for planning management and discharge.

Results: Overall, the mean LOS was shorter during the intervention period than during the control period, but the difference was not statistically significant (12.0 and 14.4 days respectively, $p = 0.13$). The difference was significant on ward A (11.0 v. 14.7 days respectively, $p = 0.02$) but not on ward B (13.0 and 14.0 days respectively, $p = 0.90$).

Interpretation: An intervention at the level of the admitting physician may help to shorten LOS on a general medical ward.

Studies of length of stay (LOS) in hospital have mainly addressed patient characteristics, such as disease severity, and institutional characteristics, such as adequate discharge planning.[1–3] Changing medical practice has also been correlated with LOS for specific diseases and treatments.[4,5] However, general interventions at the level of the physician have aimed at shortening LOS only by creating incentives[6,7] or establishing target LOS[8] rather than attempting to intervene directly in the practice patterns of physicians.

To identify some general characteristics of medical practice that may affect LOS, we surveyed 60 health care personnel representing 6 professions at the Royal Victoria Hospital in Montreal. Respondents were asked to list causes of unnecessarily long stays on medical wards.

Many respondents mentioned physician-dependent factors, including delays in ordering tests, delays in seeking medical consultations and the lack of a clear therapeutic plan. According to respondents, physicians rarely contact outside colleagues to avoid duplicate investigations. They try to address all of the patient's problems in hospital. Yet, they address most problems other than the main diagnosis only later in the patient's hospital stay. These factors seemed to cause unnecessarily long stays.

On the basis of these observations and the results of an LOS study from our institution,[9] we generated the hypothesis that physician-dependent factors could be systematically influenced to shorten LOS by asking the admitting physician to address these factors.

We designed the intervention to guide physicians to list the patient's problems and to sort them for either outpatient or inpatient management; to contact the patient's physician to avoid repeating tests; to contact appropriate consultants; to request tests that may be needed during the hospital stay; and to initiate discharge planning.

Methods

The study was carried out on the 2 general medical wards of the Royal Victoria Hospital,

both of which are clinical teaching units of McGill University. Each unit consists of an attending physician and a team of house staff and medical students. The study was performed using departmental resources, without external funding.

The design was a prospective comparison before and after the intervention, with additional collateral controls. A pre-intervention (control) period and an intervention period, each 4 weeks, were chosen to correspond to house-staff rotations. On each ward, a different team and attending physician were on service during each period. The intervention consisted of an admission planning checklist (Fig. 1) placed in front of the hospital chart at admission by the ward coordinator.

All admissions to the 2 wards during the 2 periods were considered for the study. We included admissions from the emergency department, the patient's home or another service. We excluded transfers from the intensive care unit (ICU) or critical care unit (CCU) and readmissions within 15 days of discharge. Discharges included all those to the patient's home or a rehabilitation hospital and all transfers to the geriatric rehabilitation ward or to another service (e.g., surgery). We excluded transfers to the ICU or CCU; these were considered discharges only when the patient left the hospital eventually from a medical ward, the ICU or CCU. The same rules applied during the control and intervention periods.

1. ☐ **Identify all problems and categorize them as requiring inpatient or outpatient investigation:**
   a. _____ ☐ Inpatient ☐ Outpatient
   b. _____ ☐ Inpatient ☐ Outpatient
   c. _____ ☐ Inpatient ☐ Outpatient
   d. _____ ☐ Inpatient ☐ Outpatient
   e. _____ ☐ Inpatient ☐ Outpatient
   f. _____ ☐ Inpatient ☐ Outpatient
   g. _____ ☐ Inpatient ☐ Outpatient
   h. _____ ☐ Inpatient ☐ Outpatient
2. ☐ **Call patient's usual physician today, find out previous test results and discuss items in the outpatient category.**
3. ☐ **Let patient authorize file transfer with coordinator today.**
4. **List all consultants and tests expected to be needed and write requests (they can be cancelled later):**
   ☐ Medical or general surgery consult? Call resident today.
   ☐ Surgical subspecialty consult? Call staff surgeon today.
   ☐ Tests likely to be required during stay? Book them today.
5. **Special categories**
   ☐ Diabetic? Will need teaching for home? Call endocrinology for teaching today.
   ☐ CVA? Can patient not walk or swallow? Call pt/ot and apply for placement.
   ☐ DVT/PE? Start warfarin today unless contraindicated.
   ☐ IV antibiotics foreseen for over 15 days? Apply today for home IV therapy.
   ☐ Advanced AIDS? Apply today for placement.
   ☐ COPD? Need for home O_2? Apply today.
6. **Consider a geriatrics consult if any of the following apply:**
   ☐ Elderly person living alone?
   ☐ Delirium or dementia?
   ☐ Problems with activities of daily living, especially if recent decline (mobility, continence, dressing, hygiene, eating)?
   ☐ Polypharmacy?
   ☐ Recent hospital discharge with frequent visits to emergency department?
7. ☐ **List the factor(s) most likely to delay the date of discharge:**
   _____
8. ☐ **Write proposed date of discharge (Fridays to be avoided for patients requiring home O_2, home care, IV antibiotics):**
   _____

Fig. 1: Admission planning checklist, used as physician-centred intervention to shorten hospital stays.

At the beginning of the intervention period, each attending physician and house-staff team was briefed on the study; the admission planning checklist was introduced and its use encouraged. Thereafter, no further sessions took place between study investigators and the ward physicians. The physicians and house staff were asked to fill out the checklist within 24 hours of admission or, for weekend admissions, within 72 hours. Attending physicians were asked to reinforce the use of the form during the intervention period. The checklist was collected from the chart by a research nurse at 72 hours. No copy was left on the chart. The diagnosis-related group and discharge date were abstracted from the charts, matching the unique number assigned for each admission.

The main outcome factor was the mean LOS on each ward during the control and intervention periods. An additional endpoint was the number of readmissions within 15 days of discharge. An LOS exceeding 30 days was counted as 30 days; after this period, it is hospital policy to declare the patient's status as "long-term care" and transfer him or her to another census.

We used an intention-to-treat analysis to test for the effect of the intervention. LOS data from the control and intervention periods were compared using a 2-sided Mann–Whitney test, with correction for ties.

To assess whether differences in LOS between the 2 periods could be explained by case mix, we compared the mean observed LOS with the mean predicted LOS for the case mix of the ward for a given period. Comparison values were based on the mean provincial LOS for each patient's diagnosis-related group.

The study was approved by the Royal Victoria Hospital Ethics Committee, and informed consent was obtained from the physicians participating in the study. It was not deemed necessary to obtain consent from patients because the physicians, rather than the patients, were the subjects of the intervention. The investigators did not view any patient's record. Authorized hospital archivists provided information on diagnosis-related groups and LOS as an abstracted data set.

Results

Of the 248 admissions during the 2 periods, 41 (17%) were excluded for the reasons noted above, leaving 101 admissions in the control period and 106 in the intervention period. Checklists for 100 (94%) of the 106 patients admitted during the intervention period were obtained; the checklists for the other 6 were either lost or never put on the chart. Of the 100 checklists gathered, 86 had been completed; the response rate did not vary significantly between the 2 wards (83% for ward A and 88% for ward B). However, the response rate for different items on the checklist varied: items 1, 7 and 8 were checked most often (86%, 68% and 83% respectively).

During the control period the mean LOS on the 2 wards were comparable (Table 1). The hospital stays were shortened by the intervention on both wards, but the reduction was statistically significant only on ward A.

To assess the effect of case mix on LOS differences, we

compared the mean LOS with the LOS predicted by the diagnosis-related groups. The mean observed LOS routinely exceeded the mean provincial LOS for each diagnosis-related group. The gap between the provincial mean and the actual LOS decreased during the intervention period by 3.0 and 2.5 days on wards A and B, respectively, compared with the control period.

Readmission rates for ward A and ward B were 13% and 10% respectively during the control period, compared with 6% and 11% during the intervention period.

Additional analyses to control for month-to-month variation and for individual physician suggested that neither of these factors had a major effect. Furthermore, there had not been a trend toward shorter LOS over the preceding year.

Reactions to the project differed on the 2 wards. On ward A, the predicted discharge date became a topic of discussion at daily signout rounds. On ward B, staff complied with the study, but no particular emphasis was placed on the intervention. After the study, participants from both wards said that the checklist had created a new awareness that LOS was based on medical decisions, but that the intervention probably had no effect on LOS.

Interpretation

This pilot study suggests that an intervention directed at physician-dependent factors can reduce LOS. The LOS observed in this tertiary-care teaching hospital routinely exceeded the mean provincial LOS for each diagnosis-related group. A clinically meaningful reduction in actual LOS was demonstrated on both wards. This effect did not occur at the expense of an increased readmission rate.

The intervention was simple, and participants found it easy to apply. House staff found the checklist to be a good template for approaching and planning an admission. They reported that it increased their awareness of the objectives of a hospital stay, of inpatient versus outpatient investigations and of early medical discharge planning.

Our study did not address whether such an intervention would result in a sustained reduction in hospital stay. Also, the method of presenting the intervention to physicians compared with the intervention itself could not be addressed with the design used.

This pilot project constitutes the basis for further study of larger numbers of patients, physicians and wards to assess the impact of a management and discharge planning intervention directed at the admitting physician. It is likely that other physician-dependent factors can be identified. We need to determine which of them is of general relevance in order to design a more widely applicable intervention. We believe that this approach may lead to substantial gains in the efficient use of hospital beds.

Table 1: Mean lengths of stay on 2 general medical wards before and after introduction of admission planning checklist (intervention)

	Mean length of stay (and SEM), d		
Location	Before intervention	After intervention	*p* value
Ward A	14.7 (1.7) *n = 53*	11.0 (1.6) *n = 52*	0.02
Ward B	14.0 (1.7) *n = 48*	13.0 (1.1) *n = 54*	0.90
Total	14.4 (1.2) *n = 101*	12.0 (1.0) *n = 106*	0.13

Note: SEM = standard error of the mean.

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Competing interests: None declared.

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Correspondence to: *Dr. John C. Setrakian, Rm. E2.61, Department of Internal Medicine, Royal Victoria Hospital, 687 Pine Ave. W, Montreal QC H3A 1A1; fax 514 843-1582; jsetrakian@aol.com [No reprints available]*