

Implementing Psychiatric Interventions on a Medical Ward: Effects on Patients' Quality of Life and Length of Hospital Stay

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Objective: The authors investigated the effects of implementing psychiatric interventions on a general medical ward by means of a stepped detection and treatment strategy conducted by a consultation–liaison (CL) nurse in terms of reducing length of hospital stay (LOS) and improving quality of life (QOL) at discharge. **Materials and Methods:** One hundred ninety-three patients participated in a controlled trial, in which patients were screened with COMPRI and INTERMED. A nurse under supervision of a CL psychiatrist conducted interventions, consisting of simple psychiatric interventions by herself, referral to auxiliary services, or initiation of postdischarge care. Intervention patients were compared with historic controls on LOS and QOL (SF36) at discharge. **Results:** In multivariate analysis of variance, a significant effect of the intervention on QOL ($p = 0.037$) was found, which diminished after controlling for confounders ($p = 0.28$). No significant effect on LOS was found for the whole sample ($p = 0.72$), but in patients age 65 years or older, a reduction in LOS ($p = 0.05$) was found. This effect remained after controlling for confounders ($p = 0.06$). **Conclusions:** These data suggest that screening for risk of increased health care might improve outcomes in general medical inpatients. Because of the design of the study, however, these findings should be considered preliminary and confirmed in a larger, multicenter, randomized controlled trial. **Key words:** internal medicine, psychiatry, LOS, health status, quality of life.

LOS = length of stay; **QOL** = quality of life; **CL** = consultation–liaison; **SF36** = medical outcomes study short form 36; **COMPRI** = complexity prediction instrument; **INTERMED** = interdisciplinary medicine.

INTRODUCTION

Approximately 27% of patients admitted to medical wards have significant psychiatric disturbances fulfilling DSM-IV criteria (1). However, implementation of psychiatric interventions in general health care is still limited because of a poor detection rate, both in outpatient and in inpatient care (2,3).

An important reason for this lack of attention for psychiatric illness seems to lie in the inability to demonstrate the effectiveness of psychiatric interventions on medical outcomes. Two randomized controlled trials have assessed the effectiveness of implementing psychiatric interventions on general medical wards by means of standard screening for psychiatric symptoms and subsequent treatment compared with usual care (4,5). In one study, the effects of psychiatric consultation on length of stay (LOS) and costs were studied (4). Within the first days of admission, patients were screened (depression, anxiety, confusion, and pain) and randomized, at the level of ward team, to care as usual or psychiatric consultation. No evidence for a reduction in LOS, hospital-based or postdischarge costs in the next 6 to 21 months, was found. In another study (5), patients were screened for psychiatric symptoms and randomized to care as usual or to a condition in which a consultation–liaison (CL) psychiatrist gave written treatment recommendations. No evidence was found for an improvement in mental health status or quality of life (QOL), or a reduction in costs, in the next 6 months.

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We hypothesized that the lack of effects in these studies stems from a discordance between screening and outcomes: if the goal were to reduce LOS and improve QOL, treatment should be focused on patients at risk for long LOS and poor QOL. We have therefore developed a different strategy to implement psychiatric care on medical wards. The COMPRI was developed and validated in a European study as a quick screening instrument to detect medical patients at risk for increased health care use during hospital stay. It consists of 13 items (yes or no) and is administered in the first two days of admission (6,7). The INTERMED assesses biopsychosocial care needs and has been validated in medical inpatients (8–10). A trained nurse, rating 20 items in the range of 0 to 3, can reliably score the INTERMED based on a patient interview. With these instruments, patients at risk for extended hospital stay and poor discharge health status can be detected within the first days of admission (11). In the present study, we assessed the effects of this strategy, implemented by a nurse specialist trained in somatic and psychiatric care, working on a medical ward for a CL psychiatric department.

MATERIALS AND METHOD

Design and Procedure

The medical ethics committee of the VU hospital approved the study, which had a design with a historic control group. By means of written informed consent, patients consecutively admitted to the two medical wards (general internal medicine and nephrology and gastroenterology) of the VU hospital in Amsterdam, in the period of February 2000 to August 2000 (historic control) and September 2000 to May 2001 (intervention), were asked to participate. In the first days of admission, a research nurse scored the COMPRI, based on information from patient, doctor, nurse, and medical chart, and the INTERMED, based on a patient interview of approximately 20 to 30 minutes. Of patients with severe cognitive problems or language deficits, the family was interviewed.

In the first study period (historic control), patients received care as usual; the COMPRI and INTERMED scores were kept hidden from the ward staff, which were encouraged to refer to auxiliary services as they normally would. Similarly, patients were encouraged to communicate any problems to their treating physician. In the intervention period, patients with a COMPRI score more than 5 and an INTERMED score more than 20 were immediately discussed with the responsible doctor and nurse and reviewed in the weekly interdisciplinary case conference attended by representatives of the ward staff, social work, dietician, and physiotherapist. Also, under supervision of a CL psychiatrist, the CL nurse—who also conducted the INTERMED assess-

ment—offered one or more of the following interventions: relatively simple psychiatric or geriatric interventions conducted by the nurse herself, such as alcohol counseling or prevention of delirium; referral to paramedical specialists for diagnosis or treatment, including CL psychiatry; and/or initiation of postdischarge care within 2 weeks after discharge. For example, to improve detection and treatment of delirium, efforts were undertaken to improve timely detection of patients with delirium by the ward nurses by means of observation lists for patients at risk. When patients with delirium were detected, simple interventions were proposed based on the hospital guidelines for the prevention and treatment of delirium. This included systematic reorientation of the patient, taking care that the patients wear appropriate glasses and hearing aids, and initiation of a psychiatric or geriatric consult.

In Figure 1, a case vignette and a description of the interdisciplinary treatment of a patient is described as an example.

A research assistant (not the research nurse who performed the baseline interview and interventions) scored LOS, medical data, and the involvement of auxiliary services at discharge, and gave the SF36 to the patient. If the form was not returned within 2 weeks, she tried to administer the questionnaire by means of a telephone interview.

Variables

COMPRI

The COMPRI consists of 13 items (yes or no), of which four items are rated by the doctor and three are rated by the nurse (5,6). A research nurse, employed by the department of psychiatry, rated the six remaining items based on a patient interview. Predictions made by the doctor were: (1) do you expect this patient to have a hospital stay of at least 2 weeks?; (2) do you think the organization of care during hospital stay will be complex?; (3) do you expect that this patient's mental health will be disturbed during hospital stay?; and (4) is the patient known to have a currently active malignancy?

Predictions made by the nurse were: (5) do you expect this patient to have a hospital stay of 2 weeks or more?; (6) do you think the organization of care during hospital stay will be complex?; and (7) do you think this patient will be limited in activities of daily living after discharge?

Questions scored by the research nurse were: (8) did the patient have a negative health perception during the past week?; (9) did the patient have walking difficulties during the past 3 months?; (10) did the patient have more than six doctor visits during the past 3 months?; (11) did the patient take more

Case-vignette: Patient was a 62-year-old man having an emergency admission on the department of Internal medicine. The reason for admission was ascites and related dyspnoea. Patient was known with hepatitis B, myocardial infarction, rib fracture, ischemic cerebrovascular accident and related expressive aphasia and impaired ventricle function. According to the general practitioner, patient was an alcoholic, who used in addition to his cardiac medication about 150 milligrams of oxazepam per day. The differential diagnosis was alcoholic cirrhosis, cirrhosis related to hepatitis B or decompensation due to a chronic condition of the heart. Patient was divorced, had two children and had retired two years ago. In the past, the patient has been a heavy drinker until 20 years ago the hepatitis B was diagnosed. In the last 10 years he used cocaine on a regular basis but has stopped about a year ago. Patient had almost no contacts. After his divorce there had been a period of three months that he felt blue and was not quite able to keep up with the demands of his work. At the moment of the interview, there were no clear cognitive signs on a clinical level, nor signs of withdrawal. Remarkable was the aphasia, which was predominantly expressive, although communication was possible. Patient was tired, preoccupied with the need to have benzodiazepines and indifferent towards life.

The following INTERMED score was obtained (total score =37):

	HISTORY	CURRENT STATE	PROGNOSES
Biological	3 Chronicity	3 Severity of symptoms	2 Complications and life threat
	1 Diagnostic dilemma	1 Diagnostic challenge	
Psychological	3 Restrictions in coping	1 Resistance to treatment	3 Mental health threat
	2 Psychiatric dysfunctioning	2 Psychiatric symptoms	
Social	1 Restrictions in integration	1 Residential instability	2 Social vulnerability
	3 Social dysfunctioning	3 Restrictions of network	
Health Care	3 Intensity of treatment	0 Organisation of care	1 Coordination
	1 Treatment experience	1 Appropriateness of referral	

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Inter-disciplinary treatment: Based on the INTERMED score, a psychiatric and a social work consult were asked for and a multidisciplinary case conference was organized on the 3rd day of admission. To the internists, it became clear that the ascites was most probably related to a right decompensation. A combination of rigorous drug treatment with a puncture was sufficient to get the patient in a physical state to start a rehabilitation program. The psychiatrist diagnosed a depression with passive suicidal ideation and a benzodiazepine dependency. A sedative antidepressant without negative effects on the cardiovascular system was prescribed, and motivational talks to counteract negative thoughts were started to facilitate a transfer to the department of psychiatry. The ward nurses initiated a rehabilitation plan, together with the physiotherapist and the C-L nurse for the period on the ward. After about ten days, the program started to become effective. Patient was out of bed for most of the day, had the feeling that he was less depressed and wanted to start a new life. The benzodiazepines were tapered off. Five days later, the patient was discharged to the psychiatric unit.

Figure 1. Case vignette of interdisciplinary treatment of a patient.

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than three different kinds of medication the day before admission?; is this an unplanned admission?; and (12) is the patient retired?

The list of items was derived from an extensive list of potential risk factors for hospital-based health care utilization. In a prospective study of 2158 patients from 10 hospitals in seven European countries, the items that were most predictive of LOS and a series of other indicators for hospital-based care utilization were selected (6,7). Items 1 through 3 and 5 through 7 are given a weight of 2 points for every positive rating; the remaining items are given a weight of 1 point for every positive rating. The scores are summed, resulting in a potential score range of 0 to 19. Elsewhere, we found that the admission COMPRI score was correlated to a series of outcomes at discharge (eg, LOS: $r = 0.47$; $p < 0.01$; number of medications during hospital stay: $r = 0.49$; $p < 0.01$; complexity rating by doctor: $r = 0.46$; $p < 0.01$; complexity rating by nurse: $r = 0.49$; $p < 0.01$) (6,7).

INTERMED

The INTERMED consists of a grid with four domains: biological, psychological, social, and health care (8). Of each of the four domains, five variables are rated 0 to 3 according to a manual with clinical anchor points, resulting in a potential score range of 0 to 60. Scoring is based on a patient interview and a review of the medical chart. The following variables were scored: (1) chronicity; (2) diagnostic dilemma; (3) severity of symptoms; (4) diagnostic challenge; (5) complications and life threat; (6) restrictions in coping; (7) past psychiatric dysfunctioning; (8) resistance to treatment; (9) psychiatric symptoms; (10) mental health threat; (11) restrictions in integration; (12) social dysfunctioning; (13) residential instability; (14) restrictions in network; (15) social vulnerability; (16) intensity of previous treatment; (17) past treatment experience; (18) organization of care; (19) appropriateness of referral, and (20) need for coordination of care.

Elsewhere, we reported on the development, reliability, validity, and applications of the INTERMED (8–16). A cut off score of 20 of 21 was found to be optimal in detecting patients at risk of long LOS and poor QOL at discharge (11). For this cut-off score, we also found good inter-rater reliability between two raters, as indicated by a Kappa of 0.85 (13).

SF-36

To assess QOL, we used the SF-36 because it is focused on physical, social, and mental aspects of functioning and health. The SF-36 consists of 36 items organized into eight scales (physical functioning, social functioning, role limitations caused by physical pain and mental health, role limitations caused by emotional problems, vitality, and general health) (19). Each of the scales was recoded into standardized scores with a scoring range between 0 and 100 (100 = optimal functioning). When scores on one or two of the items in a scale were missing, the median score on that item was used for extrapolation. We used the acute version of the instrument (20,21) that uses a time frame of the past week (as opposed to the past 4 weeks) as such a shorter recall period would be more sensitive to changes in health status during hospital stay. This version has psychometric qualities comparable with the 4-week version. We used the Dutch translation, which has been developed and validated in the International Quality of Life Assessment Project (22).

Medical Data

At discharge, the medical file was examined for LOS, medication use at admission and discharge, and referral to the following auxiliary services: CL psychiatry, transfer nurse, physiotherapy, social work, dietetics, medical psychology, and geriatric medicine. Also, a crude categorization was made with respect to the admission problem. Two independent raters scored whether the problem was gastroenterologic, endocrinologic, cardiologic, pulmonary, nephrologic, an infectious disease, or other.

Statistical Analysis

Of the surviving patients, LOS and QOL of the positively screened patients in experimental group were compared with the controls. For QOL, multivariate analysis of variance (MANCOVA) was used with the eight scales as multiple dependent variables, controlling for the following confounders: age, sex, COMPRI score, and INTERMED score. For LOS, because of its

skewness, nonparametric statistics were used to assess group differences (Mann-Whitney's U-test). To control for confounders, multiple regression analysis on the natural logarithmic transformation of LOS, was conducted with the same confounders as in the MANCOVA. All analyses were performed on intention-to-treat basis and were based on two-tailed tests. As a secondary analysis, a comparison was made between outcomes of the negatively screened patients in the intervention group and the control group to study potential time effects.

RESULTS

During the study period, 1311 patients were admitted. Patients were excluded if admitted for a specialty other than general internal medicine, nephrology, or gastroenterology ($N = 267$), if LOS was less than 2 days ($N = 167$), or if the patients had already been enrolled in the study before ($N = 92$). Of the remaining 785 patients, informed consent was obtained from 644 patients (82%), equally distributed among experimental (83%) and control patients (81%). Screening resulted in 231 positive cases (36%), comparable for experimental (35%) and control patients (37%). At discharge, 193 positive cases were alive (93 historic controls and 100 intervention patients). Of the 93 patients in the control group, 22 (24%) were interviewed on the first day of admission, 33 (35%) on the second day, and 37 (40%) on the third day (one missing data). Of the 100 patients in the intervention group, 32 (32%) were interviewed on the first day, 42 (42%) on the second day, and 23 (23%) on the third day (three missing data). In the intervention period, timing of the interviews tended to be slightly earlier, although this was not significant ($\chi^2 = 6.95$; $p = 0.07$).

No difference in survival between positive experimental (82%) and control patients (85%) was found ($\chi^2 = 0.47$; $df = 1$; $p = 0.49$). Of the patients alive at discharge, QOL assessment was obtained in 143 patients (62 controls [67%] and 81 intervention patients [81%]). Patients with missing QOL assessment did not significantly differ on baseline variables: sex, marital status, dependent living, age, length of stay, INTERMED score, and COMPRI score. No significant differences were found when these comparisons were made for the baseline and the intervention sample, separately. In Figure 2, the study flow chart is shown.

In Table 1, a comparison between baseline and intervention patients is shown. With respect to the admission data, patients

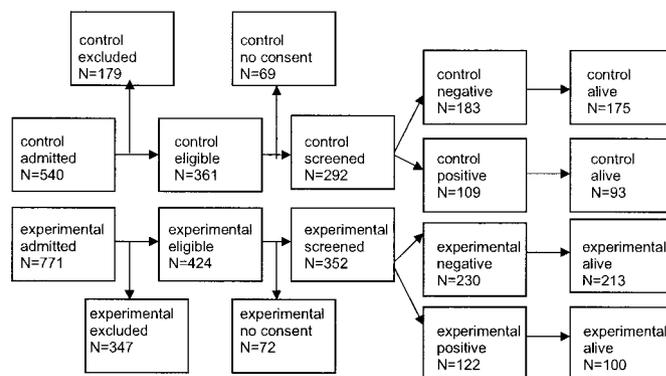


Figure 2. Study flow chart.

TABLE 1. Comparison Between Intervention and Historic Control Patients on Baseline Data and Referral Pattern

	Historic control (N = 93)	Intervention (N = 100)	Test-value	<i>p</i>
Age (yr: mean, sd)	61.9 (17.7)	69.7 (17.6)	T = -3.08	.002
Sex (male; %)	43 (46%)	45 (45%)	Z ² = 0.03	.86
Mantal status				
Married	27 (29%)	35 (35%)		
Unmarried	25 (27%)	30 (30%)		
Widowed/Divorced	38 (41%)	33 (33%)	χ ² = 1.52	.47
Living situation				
Independent	58 (62%)	72 (72%)		
(Partly) dependent on others	32 (34%)	28 (28%)	χ ² = 1.37	.26
N types of medications (mean; sd)	5.9 (3.5)	6.1 (3.6)	T = -0.28	.78
Primary admission problem				
Gastro-enterology	29 (31%)	23 (23%)		
Endocrinology	12 (13%)	9 (9%)		
Cardiology	5 (5%)	13 (13%)		
Infectious disease	5 (5%)	9 (9%)		
Pulmonology	13 (14%)	10 (10%)		
Nephrology	7 (8%)	12 (12%)		
Other	22 (24%)	24 (24%)	χ ² = 1.79	.29
Referral to auxiliary services				
CL psychiatry	24 (26%)	64 (64%)	χ ² = 35.5	<.01
Transfer nurse	1 (1%)	2 (2%)	χ ² = 0.4	.52
Physiotherapy	29 (31%)	37 (37%)	χ ² = 2.1	.15
Social work	6 (6%)	14 (14%)	χ ² = 4.1	.04
Dietetics	12 (13%)	15 (15%)	χ ² = 0.6	.43
Medical psychology	4 (4%)	2 (2%)	χ ² = 0.5	.46
Geriatric medicine	7 (8%)	3 (3%)	χ ² = 1.4	.23

in the intervention group were significantly older. No differences occurred on other socio-demographic or medical admission data. As expected, the referral pattern to auxiliary services differed between baseline and intervention period because of the addition of the CL nurse on the ward. Still, even during the baseline period, most of the detected patients were actually referred to the auxiliary services on the physician's initiative. Most clearly, more patients were referred to CL psychiatry during the intervention period, but also a significant difference occurred on referral to social work. For the remaining services, no differences occurred.

Of the 100 positive experimental patients, the nurse was actually involved in 95; the remaining five were either discharged before her involvement or were considered as "false-positives" who needed standard care. The nurse conducted psychiatric or geriatric interventions herself in 52 patients (55%). Of the 64 patients referred to CL psychiatry, the most common diagnoses were delirium (19%), dementia (18%), and depression (14%); in 49 of the 64 referred patients (76%), psychoactive drugs were prescribed. In 34 patients (36%), help at home was organized, and in 16 (17%) patients, ambulatory psychiatric care was organized. Of the baseline patients, seven of 93 (7.5%) were referred to either a psychiatric hospital or a nurse home, whereas of the intervention patients, 17 of 100 were referred (17.0%). This difference reached statistical significance ($\chi^2 = 3.97$; $p = 0.046$).

In Table 2, a comparison of the two groups on outcomes is shown. No overall significant effect of the intervention on

LOS ($p = 0.72$) was observed in the nonparametric test. Because the patient groups significantly differed on age, we repeated the comparisons in younger and in elderly patients. For this analysis we used the pragmatic cut-off point of age 65 years, because this resulted in as many patients as possible for both subgroups. In the subgroup of elderly patients, a shorter LOS was found in the intervention group ($p = 0.05$), whereas in the subgroup of younger patients, no significant differences occurred.

The multivariate analysis of variance of the eight SF-36 scales resulted in a significant overall effect of intervention on QOL ($F = 2.1$; $p = 0.037$). After the addition of sex, age, COMPRI, and INTERMED in the multivariate model, a significant effect of age ($F = 4.7$; $p < 0.001$) and nonsignificant effects of sex ($F = 1.6$; $p = 0.14$), INTERMED ($F = 1.6$; $p = 0.14$), COMPRI ($F = 1.4$; $p = 0.22$), and intervention ($F = 1.2$; $p = 0.28$) were found.

The comparison between outcomes of the negatively screened patients yielded the following results: in the control group ($N = 175$), a median LOS of 7 days was found, whereas in the intervention group ($N = 213$) the median LOS was 8 days (Mann-Whitney's U-test: $Z = -1.6$, $p = 0.10$). For patients age 65 or older (in the control group: $N = 75$), median LOS was 7 days, compared with ($N = 106$) 9 days ($Z = -1.8$, $p = 0.07$) for intervention patients. For patients younger than 65 in the control group ($N = 100$), a median LOS of 7 days was found; in the intervention group ($N = 107$), the median LOS was 8 days ($Z = -0.40$, $p = 0.69$).

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TABLE 2. Comparison Between Intervention and Historic Control Patients on LOS and Aspects of QoL at Discharge

	Historic control (N = 93)	Intervention (N = 100)	Test-value	<i>p</i>
LOS (days; median, IQR)	13 (7–24.5)	12 (7–21.75)	Z = -0.4	.72
Age ≥ 65 yr: ^a	16 (9–31.5)	11.5 (7–21.25)	Z = 2.0	.05
Age < 65 yr: ^b	10 (5.5–22.5)	13.5 (7.75–25.5)	Z = -1.2	.23
QoL (mean; sd) ^c				
Physical functioning	35.8 (28.8)	28.3 (25.5)	T = 1.7	.10
Social functioning	41.1 (28.9)	48.6 (25.0)	T = 1.7	.11
Role-physical	13.7 (29.9)	11.4 (25.9)	T = 0.5	.63
Role-emotional	27.4 (41.6)	41.6 (47.0)	T = -1.9	.06
Mental health	47.0 (22.9)	50.2 (25.5)	T = -0.8	.44
Vitality	34.5 (19.7)	32.8 (22.4)	T = 0.5	.63
Pain	54.9 (33.6)	60.6 (32.2)	T = 1.0	.31
General health	34.3 (17.6)	40.2 (20.6)	T = -1.8	.07

^a N = 44 versus 70.

^b N = 49 versus 30

^c N = 63–64 versus 81–84.

DISCUSSION

Results of this study suggest that implementing psychiatric interventions by a CL nurse might improve outcomes in general medical inpatients. We found an overall effect on QOL in the total sample, and we found a reduction of LOS in the elderly patients. However, the effect on QOL was rather small and did not hold after controlling for confounders. The effect on LOS was positive only in the elderly and was independent of the confounders. This finding is in concordance with studies in geriatric medicine (23,24). The cause for such an effect may lie in earlier detection of psychosocial problems and their subsequent treatment. Often, detection of problems, such as cognitive or mood disorders, occurs late in the course of admission, and in such cases, treatment would prolong hospital stay. In our study, detection of psychosocial problems in the first days of admission most likely improved during the intervention phase.

Overall, the interventions conducted by the CL nurse consisted of simple psychiatric or geriatric interventions performed by herself and more active referral to CL psychiatry. In three quarters of the detected patients, referral to CL psychiatry was requested, which in addition to psychological management often led to the prescription of psychoactive drugs. The addition of the CL nurse on the ward did not produce significant differences in referral to other auxiliary services in the hospital, except for (slightly) more referrals to social work. In most patients seen by the CL nurse, some form of postdischarge care was organized. We were not able to obtain information on this in the historic control group. Together, these observations illustrate that the intervention should not be viewed as strictly psychiatric but may be described as hospital-based case management, with a specific emphasis on psychiatric interventions. Our intervention thus bears some resemblance to the intervention by Curley et al. (25) describing the introduction of interdisciplinary rounds on medical wards. Because the intervention described in the current study had an effect on the initiation of postdischarge

care, we recommend in future research to incorporate an assessment of outcomes some time after discharge.

In this study, a feasible model of implementing psychiatric care on a general medical ward is presented, in which psychiatric co-morbidity appears to be dealt with in an effective way. Our findings should be considered with caution. We were not able to implement the study as a randomized controlled trial because of the fact that the participating wards were not comparable in case mix. The alternative of dividing the two wards into random halves was felt inappropriate because of the threat of contamination between standard care and intervention after the introduction of interdisciplinary case conferences for half of the complex patients. As a result, we could not fully rule out a time effect as an explanation for our findings; however, the finding that LOS increased in nondetected patients during the intervention period seems to suggest that a time effect does not explain our reported effects. More problematic seems to be the difference in age between the baseline and intervention patients. Although in our subgroup analyses we demonstrated an effect on LOS of the elderly patients, it remains unclear how age may have interfered with our findings. We therefore conclude that although our findings seem promising, they would need to be confirmed in a larger study, ie, preferably a multicenter, randomized, controlled trial.

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