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The first general practitioner hospital in The Netherlands: towards a new form of integrated care?

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Objective – To describe the types of patients admitted to the first Dutch general practitioner (GP) hospital, their health-related quality of life and its substitute function.

Design – A prospective observational study.

Setting – The remaining 20-bed ward of a former district general hospital west of Amsterdam; a region with 62 000 inhabitants and 26 GPs.

Subjects – All patients admitted during the 12 months between 1 June 1999 and 1 June 2000.

Main outcome measures – Patients' health-related quality of life (Medical Outcome Study 36-item Short Form Health Survey, Groningen Activities Restriction Scale), GPs assessments of severity of illness (DUSOI/WONCA Severity of Illness Checklist) and alternative modes of care.

Results – In total, 218 admissions were recorded divided into 3 bed categories: GP beds (n = 131), rehabilitation beds (n = 62) and nursing home beds (n = 25). The mean age of all patients was 76

years. Main reasons for admission were immobilization due to trauma at home (GP beds), rehabilitation from surgery (rehabilitation beds) and stroke (nursing home beds). Overall, patients showed a poor health-related quality of life on admission. If the GP beds had not been available, the GPs estimated that the admissions would have been almost equally divided among home care, nursing home and hospital care. The severity of the diagnosis on admission of the 'hospital-care group' appeared to be significantly higher than the other care groups. **Conclusion** – The GP hospital appears to provide a valuable alternative to home care, nursing home care and hospital care, especially for elderly patients with a poor health-related quality of life who are in need of short medical and nursing care.

Key words: elderly care, GP hospital, health-related quality of life.

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Since the 1980s, there has been a progressive reduction in hospital beds in The Netherlands. Consequently, hospital admission regulations have become stricter, putting the less severely ill at a disadvantage. As the ageing population increases, a growing number of elderly people in need of medical and/or complex nursing care are thus being refused admittance. This is causing GPs to look for alternative care facilities such as nursing homes or (extra) home care.

The United Kingdom, Norway and Finland are the only Western countries that have substantial experience with general practitioner (GP) hospitals, also referred to as community hospitals or cottage hospitals (1–3). With regard to elderly people, it has been suggested that GP hospitals could reduce the demand on the hard-pressed district general hospital services (4,5) and play an important role in acute care, rehabilitation, observation and assessment, and respite and palliative care (6–8). At this time, however, little is known about the severity of illness and the health-related quality of life (HRQOL) of patients who are admitted to these GP hospitals (9).

The aim of this study is to describe the types of patients admitted to the first Dutch GP hospital, their HRQOL and its substitute function.

MATERIALS AND METHODS

Setting

In the fall of 1996 the closing of a small hospital in the city of Velsen (west of Amsterdam) instigated the start of an experimental GP hospital in the Dutch health

Following the UK, Norway and Finland, The Netherlands has set up GP hospitals for community-based integrated care.

- GPs mainly admit elderly patients with a very high physical dependency and low health-related quality of life.
- GP beds appear to provide a valuable substitution of care for patients in need of hospital care, nursing home care and home care.

Table I. The GP hospital Velsen.

History	Founded in the fall of 1996 upon the closing of the district general hospital.
Setting	Former district general hospital; two other locations at 11 and 17 km distance.
Population	62 000
No. of beds	20
Intended for	Patients living in the vicinity of the former district general hospital.
Bed categories	GP beds, rehabilitation beds, nursing home beds (bed numbers following the fluctuations of demand).
Type of care	Low care, observation.
Admissions	GP beds: by GPs only. For patients in need of hospital care or nursing home care, or home care beyond the maximum care level provided. Rehabilitation beds: by senior consultants only. For postoperative patients in their last phase of clinical rehabilitation (from other hospital locations). Nursing home beds: by senior consultants only. For patients in anticipation of a vacancy in a nursing home (from other hospital locations).
Responsibility of GPs	For GP beds: patients' own GP during working hours. Out of hours: via own out of hours service in former Accident and Emergency Department in same location. For rehabilitation beds and nursing home beds: small, appointed staff consisting of GPs and a GP trainee.
Functions	Outpatient clinics. Laboratory and radiodiagnostic facilities. Paramedical aid, such as physiotherapy, ergotherapy and speech therapy. Occupational therapy.
Participating GPs	All 26 GPs in the city of Velsen, working in single or double practices, or 1 of 2 health care centres (with 3 or more GPs).

care system to ensure the continuity of low clinical care for the local population (Table I).

Data collection

The study was a prospective, observational study and included all admissions to the GP hospital between 1 June 1999 and 1 June 2000. It was approved by the Medical Ethics Committee of the Academic Medical Centre in Amsterdam. For data collection three main sources were used: hospital records, questionnaires filled out by the GPs and patient questionnaires that were obtained with informed consent. The data were collected by one of the authors (EM) along with a student and handled confidentially.

Hospital records from both nurses and GPs were used to collect demographic data, details of admission and hospital stay (diagnosis, level of dependency according to the Barthel Index (10)) and discharge (length of stay and discharge address).

Patients' questionnaires. On admission, patients received a questionnaire that included the Dutch version of the Medical Outcome Study 36-item Short Form Health Survey (SF-36) (11) to measure HRQOL and the unidimensional ADL scale (activities of daily living) of the Groningen Activities Restriction Scale (GARS) (12) to assess the level of physical dependence. The SF-36 measures eight components of health, including physical role functioning, physical functioning, vitality, general health, social functioning, emotional role functioning, bodily pain and mental health. The scores of the eight subscales were linearly transformed into scales ranging from 0 (worst

health) to 100 (best health). The GARS measures activities of daily living (ADL) and comprises 11 ADL items, each with 4 response categories. Scores may range from 11 (total independence) to 44 (total dependence, bedridden). Because of their physical dependency, the nursing home patients received help from an instructed medical student on completing the questionnaire. Terminally ill patients were excluded.

GP questionnaires. All 26 GPs involved were given verbal and written guidance on how to complete the Dukes Severity of Illness Checklist (DUSOI/WONCA), which has become part of the International Classification of Primary Care (ICPC-2) (13,14). This checklist, which was used for patients on GP beds only, contained questions about the diagnosis as well as any relevant comorbid disease at the time of admission. The resulting information was quantified in a score on four different disease parameters: symptoms, complications, prognosis and treatability. A score ranging between 0 (low severity) and 100 (high severity) was obtained for the diagnosis and all comorbidities that the GP rendered relevant to admission (overall DUSOI) as well as for the main admission diagnosis alone (diagnosis DUSOI). Since the use of ICPC codes appeared to be too diverse and summarizing on the level of ICPC chapters only too global, diagnoses on admission were categorized according to our own working definitions: musculoskeletal trauma, infection, other acute disorders, chronic disease, stroke, postoperative rehabilitation, terminal/palliative care, respite care and investigation.

In addition, the GPs were asked which alternative mode of care they would have preferred in the absence of the GP hospital, without considering the limitations in the supply of care they might have faced at the time of admission: home care, nursing home care or hospital care.

Statistics

Analysis was performed using the SPSS statistical software package (version 10.07) for continuous variables (two-sided Student's t-test), categorical variables (χ^2 -tests) and comparisons between more than two groups (one-way ANOVA) where appropriate, using a level of significance of $p < 0.05$. Responding and non-responding patients were compared on patient characteristics (gender, age, volunteer-aid, home care) and clinical characteristics (diagnosis, observed ADL, form of discharge, DUSOI/WONCA, length of stay).

To give an overall impression of patients' HRQOL on admission, means of the SF-36 of the examined patient categories were compared to reference values (> 65 years) of Dutch chronically ill patients ($n = 237$) and healthy subjects ($n = 86$), as reported by Aaronson et al. (17).

RESULTS

Patient characteristics

During the study period, a total of 218 admissions were recorded, of which 131 (60%) were GP bed admissions (Table II). While most patients appeared to be of advanced age (mean 76 years), their average length of stay varied substantially, with GP patients having the shortest (15 days) and nursing home

patients having the longest length of stay (90 days). According to the Barthel Index, nursing home patients had the lowest level of independence and rehabilitation patients the highest.

GP bed patients were more often transferred to a district general hospital and saw their GPs more frequently (3.3 visits a week) than patients in the other two categories. When the GPs visited their own patients, they stayed around 19 minutes on the ward, averaging between 41 minutes (admission) and 16 minutes (follow-up contacts). This was calculated from an observed sample of 13% of all admissions and follow-up contacts. Patients in the rehabilitation category received more specialist and paramedical treatment than patients in either of the other two categories. Specialists who were most frequently consulted were the general surgeon, internist and neurologist.

The reasons for admission are clustered in Table III. Musculoskeletal trauma appeared to be the most important reason for admission in the GP bed category and the second most important reason in the rehabilitation bed category. For the GP beds this cluster consisted of various stable fractures (51%, mainly osteoporotic vertebra) and contusional injuries (40%, heterogeneous, often hip). For the rehabilitation beds this cluster consisted of post-fracture treatment (88%; mainly hip fractures) in all but 3 cases.

Patients HRQOL

After exclusion of terminal patients, the HRQOL questionnaire was completed by 69/123 (56%) GP patients, 23/61 (38%) rehabilitation patients and 17/23 (74%) nursing home patients. There were no differences between the responding and the non-responding patients, except for 'form of discharge' and 'length of stay'. More non-responding than responding GP patients died (9% vs 1%) or were transferred to a hospital (28% vs 15%), while the responding patients more often went home after discharge (84% vs 63%). The mean length of stay of the non-responding rehabilitation patients was 4 days shorter than that of the responding ones (14 and 18 days, respectively). Compared to the two reference groups (chronically ill patients and a healthy population), all bed categories show a substantially lower score on the SF-36 (Fig. 1).

On admission, perceived ADL level varied from 'total independence' (GARS score 11) to 'total dependence' (GARS score 44). GARS sum scores were 28 for GP patients, 24 for rehabilitation patients and 40 for nursing home patients. Approximately one-third of the GP (39%) and rehabilitation patients (32%) and almost all nursing home patients (94%) were classified as bedridden.

Table II. The GP hospital in Velsen: general characteristics of admissions between 1 June 1999 and 31 May 2000.

	GP beds	RH beds	NH beds
No. of admissions	131	62	25
Mean age (years)	75	77	79
Female sex	63%	61%	60%
Living alone	73%	60%	62%
Barthel index on admission ¹	58.6	79.5	39.8
Average length of stay (days)	15	31	90
Number of GP visits per week	3.3	3.0	1.6
Specialist consultations	55%	69%	28%
Paramedical treatments	46%	76%	68%
Physiotherapeutic treatments per week	2.2	2.3	1.0
Transfer to hospital	19%	8%	12%
Died in GP hospital	11%	8%	28%

GP = general practitioner; RH = rehabilitation; NH = nursing home.

¹Scores ranging from 0 to 100, with higher scores representing a higher level of functioning.

Table III. Reasons for admission; all three bed categories.

	GP beds n (%)	RH beds n (%)	NH beds n (%)	Total n (%)
Admission category				
Musculoskeletal trauma	43 (32.8)	25 (40.3)	1 (4.0)	69 (31.7)
Infection	15 (11.5)	3 (4.8)	1 (4.0)	19 (8.7)
Other acute disorders	17 (13.0)	—	—	17 (7.8)
Chronic disease	22 (16.8)	5 (8.1)	7 (28.0)	34 (15.6)
Stroke	13 (9.9)	—	8 (32.0)	21 (9.6)
Postoperative rehabilitation	—	28 (45.2)	6 (24.0)	34 (15.6)
Terminal/palliative care	8 (6.1)	1 (1.6)	2 (8.0)	11 (5.0)
Respite care	8 (6.1)	—	—	8 (3.7)
Investigation	5 (3.8)	—	—	5 (2.3)
Total	131 (100)	62 (100)	25 (100)	218 (100)

GP = general practitioner; RH = rehabilitation; NH = nursing home.

Alternative mode of care and severity of illness

For all but four patients ($n = 127$) a checklist on the alternative mode of care and severity of illness was returned by the participating GPs. In their judgement, 46 patients (36%) would have stayed home with extra home care, 37 (29%) would have been assigned (temporary) admission in a nursing home, while another 44 (35%) would have been referred to a district general hospital in the absence of the GP hospital Velsen. The severity of illness of the 'home care group' appeared to be significantly lower than the 'hospital group' both for the diagnosis on admission (DUSOI diagnosis) and for the total burden of disease (DUSOI overall) (Table IV). There was a significant difference between the 'nursing home group' and the 'hospital group' for the DUSOI diagnosis but not for the DUSOI overall.

Thirteen patients from the 'hospital group' were referred to a hospital during their stay in the GP hospital (30%) compared to 6 in the 'home care group' (13%) and 5 in the 'nursing home group' (14%). Between the three alternative modes of care no difference was found in the average score on the Barthel Index (Table IV).

DISCUSSION

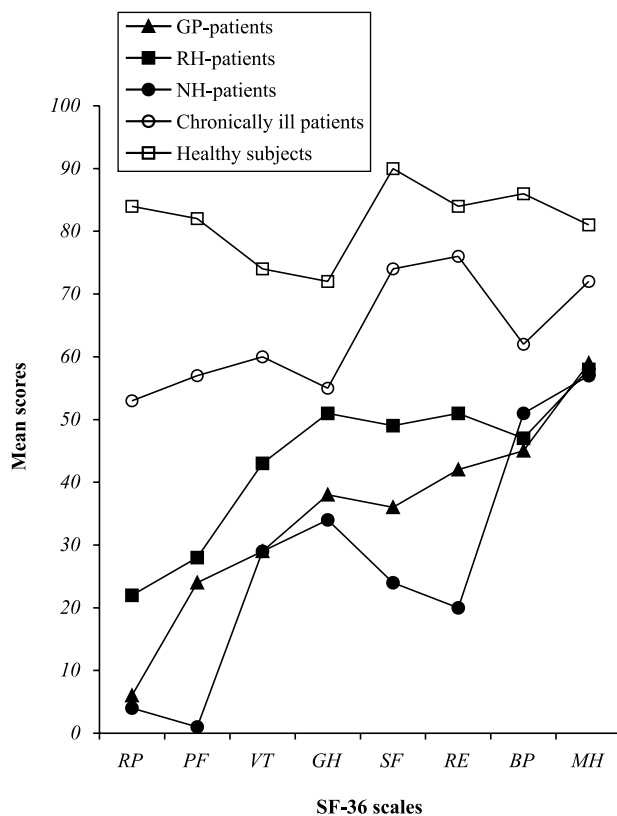
For the first time, a GP hospital has been set up in The Netherlands. It appears to be used mainly for elderly patients with a low ADL and health-related quality of life, in need of hospital care, nursing home care or home care. In the Dutch context, it is entirely new that GPs admit their own patients or care for patients that are transferred from elsewhere for further rehabilitation or final transfer to a nursing home. The numbers of rehabilitation and GP patients that were recorded to this end remain relatively small, since almost half of the beds were in permanent use by the nursing home patients. Furthermore, it was not feasible to construct

a pragmatic control group, so that judgement on the appropriateness of use and best alternative mode of care for the GP beds was left to the participating GPs. Moreover, about half of all patients on the GP beds were admitted by eight GPs only, who by their personal preferences may have influenced the observed overall pattern of admission considerably.

Since the GP bed admissions required the most complete commitment by the GP, these patients were studied in more detail. Although the severity of illness (DUSOI) checklist has been tested and validated for use in the domain of general practice, it has not yet been used in the context of GP beds. Its validation for a GP hospital is therefore uncertain. Indeed, the GPs may have overrated the scores to legitimize admissions, e.g. for patients with a focus on respite care. Nevertheless, it is interesting that with no significant differences in the Barthel Index scores among the three alternative modes of care, a significant difference was found in the severity of diagnosis on admission between home care and hospital care and between nursing home care and hospital care. Apparently, severity of illness played a more important role than physical dependency in the GPs choice of best alternative mode of care. The inclusion of comorbidity seemed to have the strongest effect on the overall severity score for patients whose best alternative mode of care was a nursing home. This may indicate that the presence of comorbidity gave these patients an overall severity rate that was too high for the domestic setting, yet not high enough for the hospital setting.

Compared to chronically ill patients, patients in the GP hospital report a remarkably low HRQOL on almost all domains. Nevertheless, it appears that the mean values on most domains differ consistently between all three bed categories. The low HRQOL is perhaps partly due to a methodological problem. As many items comprise questions about work or physical

Fig. 1. The health-related quality-of-life scores¹ of patients in the three bed categories on admission (GP, RH and NH patients)^{2,3} and two reference groups (chronically ill patients and healthy subjects)⁴.



¹For readability, standard deviations (SD) are not represented in this figure. SDs vary from 17 to 47 for GP patients, from 25 to 48 for RH patients, from 5 to 39 for NH patients, from 20 to 44 for chronically ill subjects and from 18 to 32 for healthy subjects.

²Abbreviations: GP = general practitioner; RH = rehabilitation; NH = nursing home; RP = physical role functioning; PF = physical functioning; VT = vitality; SF = social functioning; GH = general health; RE = emotional role functioning; BP = bodily pain; MH = mental health.

³Sample sizes vary from 50 to 68 for GP patients, from 19 to 23 for RH patients and 16 to 17 for NH patients due to missing values.

⁴Reference values (> 65 years) of Dutch chronically ill patients (n = 237) and of healthy subjects (n = 86) (17).

N.B. Lines between scales only link the same patient categories.

activities, the SF-36 may not be the most appropriate questionnaire for measuring the HRQOL of elderly and ill patients and may have a substantial floor effect (15). In order to determine whether GP hospitals may indeed provide a viable alternative to conventional care from the patients' perspective, further study is needed with larger patient groups and with more suitable questionnaires.

Our data show a number of similarities with some GP hospital surveys from the United Kingdom and Norway (2,6,16). With a focus on observation and low care, the GP hospitals are usually nurse-led, have

Table IV. Mean Barthel index score and mean Dukes/WONCA Severity of Illness Checklist score (DUSOI) for the alternative modes of care (n = 127).

	Alternative mode of care		
	Home n = 46	Nursing home n = 37	Hospital n = 44
Barthel Index	55.7	59.2	61.6
DUSOI overall	60.8	64.8	72.1 ¹
DUSOI diagnosis	53.7	53.9 ²	64.4 ³

¹Difference with home care p = 0.002; ²difference with hospital care p = 0.017; ³difference with home care p = 0.009.

Barthel index: scores ranging from 0 to 100 with higher scores representing a higher level of functioning.

DUSOI/WONCA: scores ranging from 0 to 100 with higher scores representing an increase of severity of illness.

access to their own diagnostic facilities and to paramedical and specialist care from outpatient clinics in the same hospital location. Patients are predominantly of advanced age and have an average length of stay of 1 to 3 weeks. Most admissions concern acute or rehabilitative care; smaller categories are formed by patients with respite, palliative/terminal and other care.

Despite a series of reports on the use of GP hospitals in the UK and Norway, there is still uncertainty about their place and value within the health care system. With an expected decrease of care supplies in all segments of the health care system in The Netherlands, there is an urgent need for discussions on the demarcation of responsibilities for the sick and needy elderly patients among all primary and secondary care providers. It is not unlikely that the substitution of care as observed in the GP hospital at Velsen may provide us with just one possible solution in solving these complex care problems. To determine whether the GP hospital provides adequate care, a future study should focus on comparing GP bed patients with the alternative modes of care they are assumed to substitute.

CONCLUSION

The GP hospital appears to provide valuable substitution of care in the domain of home care, nursing home care and hospital care, especially for elderly patients with a poor health-related quality of life who are in need of short medical and nursing care.

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