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Admissions to the medical department – who admits and why

ORIGINAL ARTICLE

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BACKGROUND

The objective of this study was to identify the basis for admission to a large medical department in Norway. We have ass
hospitalisation and whether triage may help identify relevant patients.

MATERIAL AND METHOD

All admissions to Drammen Hospital over a full week in the autumn of 2014 were recorded with the patient's age, gende referring doctor/institution, from where the patient was admitted and his/her diagnosis at admission and discharge. Alt light of the condition upon departure from the primary health services, were systematically evaluated by two general pra doctor at the medical department through a review of the referral notes. The patients were triaged in the emergency rec arrival, and the degree of seriousness of their condition was assessed against possible alternatives to hospitalisation.

RESULTS

The study included 255 admissions (52 % women, average age 62 years). In 57 % of the cases, the referring doctor was fi (GP 26 %, out-of-hours doctor 31 %) and in 24 % from the specialist health services. Altogether 18 % of the cases were a from a doctor. The most frequent diagnoses for admission included cardiovascular disease (38 %), pulmonary disorders For 7 % of the patients who had been admitted by a primary doctor we found possible alternatives to hospitalisation, mo intermediate care unit. There was no correlation between triage and alternatives to hospitalisation.

INTERPRETATION

The proportion of admissions from general practitioners was higher than that found by equivalent studies. One in every deemed relevant for alternative solutions. Triage does not identify patient pathways that are suitable for alternatives to h

Main message

General practitioners and out-of-hours doctors each accounted for approximately one-quarter of the admissions to med

A structured review of the referral notes could identify an alternative to hospitalisation in one of every eight cases, but o confirmed by a retrospective review of the hospital records

The Manchester Triage Scale (MTS) and the Modified Early Warning Scale (MEWS) triage tools are unsuitable for selec hospitalisation is avoidable

Approximately 900 000 patients are admitted to somatic hospital wards in Norway each year (1), and approximately thr admitted to an internal medicine unit (2). The 98 beds at the medical department of Drammen Hospital account for app total number of somatic beds in Norway. The department has a little more than 10 000 admissions per year, and the ma need of emergency treatment. The number of admissions is increasing at a regular pace – by 7.9 % in total from 2010 to communication).

The admissions come from GPs in the area and the out-of-hours services, as well as from specialists in private practice a the hospital. It is a policy goal to involve GPs to a greater extent in the assessment of emergency admissions (3, 4), but fe undertaken in Norway to identify those who admit patients (5).

Assessing which patients to hospitalise is one of the key tasks of doctors in the primary health service. A GP has an estim year, and somewhat less than 300 of these concern acute conditions (6). On average, 2–3 % of those who come for a con approximately 75 patients per year. The sorting undertaken by the primary doctors must be sufficient to identify conditi serious direction. The price of high safety, however, is that some patients are admitted with conditions that later turn ou

Some diseases and conditions indicate that the patient is in clear need of hospitalisation, such as suspicion of acute myo embolism and sepsis. For certain conditions there are general guidelines regarding who should be admitted, for exampl exacerbation (7) and a high Wells score for deep-vein thrombosis (8). Most often no specific criteria will be available, an degree of seriousness are not normally applied in the referral notes.

The decision to hospitalise thus tends to be based on professional discretionary judgement and an assessment of what w interests. The referring doctor will assess the medical condition and possible risk of exacerbation, the wishes and expect of kin, and psychosocial issues.

A study conducted in Tromsø found that 24 % of those who were admitted for emergency treatment at the medical depa health benefit from their hospitalisation (9). A later mapping study from Trondheim found that approximately 20 % of t emergency treatment were eligible for alternative measures, whereof admission to an observation ward constituted the l concluded, however, that at the time of admission it was difficult to distinguish between those who would benefit from h would not.

A mapping study of admissions from Værnes casualty clinic found that approximately one in every five could have been consultation with a specialist the next day or admission to a municipal intermediate care unit/nursing home (10). These retrospective analyses, and there are no prospective studies that show how patients who might benefit from hospitalisat time of admission.

Triage tools are used in most emergency receptions in Norway to assess the degree of urgency. Many use systems they h whereas others use validated tools (11). Few studies have been made to assess whether these tools can be used to identif alternatives are available.

A study from Cape Town undertaken in 2008 used the Modified Early Warning Scale (MEWS) in an emergency receptio increased with rising scores, as did the risk of death during the hospitalisation period (12). Triage tools have primarily b degrees of urgency in emergency receptions, and we have little knowledge of the applicability of these tools in the prima

In this study we registered data on admissions to a medical department with a large catchment area. We investigated wh to admission available prior to the hospitalisation period by reviewing the referral notes, and in its aftermath by studyin discharge reports. In addition, we investigated possible correlations between the result of triage in the reception and alt

Material and method

All admissions to the medical department were registered over a randomly chosen full week from Monday through Sunc

Epidemiological data

From the hospital's patient records we registered sex, age, the distribution between emergency and elective admissions, ward/treatment provided in the reception, hospitalisation time, the referring doctor and from where the patients were a registered the 25 most frequently occurring diagnoses at admission and discharge.

Prospective analysis

The referral notes from primary doctors were assessed by a medical council consisting of two GPs and a specialty registr department. We used a structured consensus method (Delphi) which has previously been used in similar studies (13). W referrals contained a defined medical issue and whether any alternatives to hospitalisation were available in light of the

The alternatives were categorised as admission to a municipal intermediate care unit, an appointment with a GP or outp and discharge to the home (with supervision if relevant), or as a pending admission and conference between the GP and

The medical council emphasised the presence of a need for diagnostic clarification, the degree of seriousness and the ris psychosocial factors. These criteria are in line with those for admission to a municipal intermediate care unit, which stat should be diagnostically clear, or the risk of exacerbation should be minor (14). This discretionary assessment was made premises that primary doctors normally need to take into account in their decisions, and with no knowledge of the furth

Retrospective analysis

The records from the hospitalisation periods were reviewed retrospectively. We compared the group for which possible been described with an identical number of patients randomly drawn from the rest of the group.

This review was undertaken by two GPs and two specialty registrars at the medical department. These doctors had not p of the referral notes and had no information as to whether or not these patients had been assigned to the group with alte

Triage

The patients were triaged by a nurse upon arrival in the emergency reception. The MEWS tool and the Manchester Triag Both are validated for triage in emergency receptions and are in use at Drammen Hospital (15–17).

The MEWS tool is based on vital variables – respiration frequency, pulse, systolic blood pressure, temperature and cons based on 52 flowcharts for various presentations in which different symptoms are rated and compiled into a total assess

Results from the triage were collated with the analyses of availability of alternatives to admission. We tested a possible c and alternatives to admission with the aid of the statistics software package SPSS.

Totalled results are reported as averages with measures of dispersion, unless stated otherwise.

Clinical information and figures have been anonymised, and no personal registrations were made. The project was appr officer at Oslo University Hospital, who is also responsible for Vestre Viken Hospital Trust. The study has also been subi for medical and health research ethics, which concluded that it was not subject to approval.

Results

A total of 255 patients were admitted during the week studied, whereof 132 were women (51.8 %) (Table 1). Approximat involved patients in the age group 16–65 years. This group accounts for approximately 80 % of the total population. Clo involved patients older than 85 years; this group accounts for approximately 3 % of the total population. However, the h found in the age group 76–85 years.

Table 1

Sex and age distribution of patients admitted to the medical department of Drammen Hospital over one week in 2014

Sex and age (years)	16–25		26–35		36–45		46–55		56–65		66–75		76–85		86+
	Number	(%)	Number	(%)	Number	(%)	Number	(%)	Number	(%)	Number	(%)	Number	(%)	Numb
Women	15	(5.9)	9	(3.5)	10	(3.9)	12	(4.7)	26	(10.2)	20	(7.8)	28	(11.0)	12
Men	2	(0.8)	10	(3.9)	12	(4.7)	15	(5.9)	16	(6.3)	28	(11.0)	24	(9.4)	16
Total	17	(6.7)	19	(7.5)	22	(8.6)	27	(10.6)	42	(16.5)	48	(18.8)	52	(20.4)	28
Population Buskerud County		(14.9)		(14.8)		(17.6)		(17.2)		(14.8)		(11.8)		(6.0)	

The patients were admitted from a regular dwelling (90 %), from another hospital department (5 %) or from another ho admitted from nursing homes or other municipal institutions were counted in the group admitted from regular dwelling

Altogether 93 % of the patients were admitted for emergency treatment, while the rest (7 %) were elective admissions. M admitted from the primary health services – 26 % by referral from a GP and 31 % from municipal casualty clinics/out-o

Table 2

Referring doctor for admissions to the medical department of Drammen Hospital over a week in 2014

Referring doctor	Number
General practitioner	67
Casualty clinic/out-of-hours services	79
Direct admission	47
Outpatient clinic and open return	45
Other institution	16
Not stated	1
Total	255

Progression

The vast majority of the admitted patients (82 %) were placed in an inpatient ward, while the others were examined and reception before discharge. The average time spent on examination and treatment in the emergency reception was two h

The hospitalisation time for those who were admitted was 3.7 days, approximately the same as for those who came direc doctor (3.5 days). With the exception of two patients, these arrived by ambulance.

Diagnoses

The main diagnoses at admission and discharge are described in Table 3. The most common diagnostic groups upon adı cardiovascular disease, 101 cases (40 %), pulmonary disorders, 28 cases (11 %) and infections, 22 cases (9 %).

Table 3

Diagnoses in patients admitted to the medical department at Drammen Hospital over one week in 2014

Diagnoses	Upon admission	
	Number	(%)
Chest pain	42	(16.5)
Cardiac arrhythmia	25	(9.8)
Angina pectoris, including unstable angina	15	(5.9)
Acute myocardial infarction	7	(2.7)
Cardiac failure, hypertension	7	(2.7)
Syncope/loss of consciousness	5	(2.0)
Cardiac valve failure, endocarditis, pericarditis	0	(0.0)
Total cardiovascular disorders	101	(39.6)
Pneumonia, all forms	12	(4.7)
Shortness of breath	8	(3.1)
Chronic obstructive pulmonary disease, including asthma	5	(2.0)
Pulmonary embolism	3	(1.2)
Total pulmonary disorders	28	(11.0)
Infections – erysipelas, sepsis, gastroenteritis, meningitis	19	(7.5)
Fever, unspecific infection	3	(1.2)
Total infections, excl. cardiovascular, pulmonary and renal disorders	22	(8.6)
Poisoning	12	(4.7)
Renal disorder	7	(2.7)
Diabetes mellitus	2	(0.8)
Total nephrological disorders/diabetes	21	(8.2)
Anaemia, haemorrhage, including gastrointestinal haemorrhage	14	(5.5)
Abdominal pain	2	(0.8)
Total gastroenterological disorders	16	(6.3)
Deep-vein thrombosis, phlebitis	13	(5.1)
Poor general condition, dizziness, somnolence, confusion, weight loss	13	(5.1)
Cancer, examination or exacerbation	7	(2.7)
Cerebrovascular disease	1	(0.4)
Other	24	(9.4)
Total various diagnoses	58	(22.7)
Diagnosis not stated	9	(3.5)

Diagnoses	Upon admission	
	Number	(%)
Total	255	(100)

Assessment of alternatives

Of the 255 patients, 146 were admitted by a primary doctor, and 135 referral notes were available. Based on these, alterr registered in 18 patients, i.e. somewhat more than 13 % (Table 4). For two of every three patients (n = 12), a bed in a mu institution was the most relevant alternative.

Table 4

Alternatives to admission in patients admitted to the medical department of Drammen Hospital over one week in 2014

Admission or alternative	Number
To be admitted	116
Total alternatives	18
Not defined	1
Total	**135**
Distribution of alternatives	
Municipal intermediate care/nursing home, observation ward	12
Appointment with GP/outpatient clinic within 3 days	3
Discharge to home, with supervision or temporary admission as needed	2
Conference between primary doctor and hospital doctor	1
Total	**18**

The doctors who retrospectively reviewed the outcome of the hospitalisation period agreed that an alternative to admiss appropriate or better for nine of the 18 patients. As regards the other nine, the admission was deemed necessary. In tota was found for 7 % of those who had been admitted by a primary doctor.

Triage

Altogether 106 patients had both a referral note that was reviewed by the medical council and had been triaged. Among 18 patients for whom relevant alternatives to admission had been identified.

Table 5 shows the alternatives to admission by degree of seriousness. The distribution proved to be random as well as u to the nine patients for whom we found that alternatives were available upon admission as well as after a review of the h

Table 5

Comparison of triage and alternative in patients admitted to the medical department of Drammen Hospital over one week in 2014. I MEWS: Modified Early Warning Scale

Comparison triage and alternative	MTS					MEWS		
Urgency groups	Total	Admitted		Alternative		Total	Admitted	
	number	Number	(%)	Number	(%)	number	Number	(%)
Immediately, 0 min., code red	0	0		0		4	4	(100.0
Very urgent, 10 min., code orange	43	41	(95.3)	2	(4.7)	16	14	(87.5)
Urgent, 60 min., code yellow	41	33	(80.5)	8	(19.5)	18	17	(94.4)
Can wait, 120 min., code green	17	15	(88.2)	2	(11.8)	35	29	(82.9)
Not urgent, 240 min., code blue	3	2	(66.7)	1	(33.3)	32	28	(87.5)
Not stated	2	2		0		1	1	
Total	106	93		13		106	93	

A correlation analysis showed a low and non-significant correlation between alternatives to admission and the two triag Pearson's r = 0.024 (p = 0.81), and for the MTS tool, the correlation was r = 0.122 (p = 0.22).

Discussion

We found that 57 % of the 255 admissions to the medical department had been made by primary doctors, distributed ap GPs and casualty clinics. Previous studies have shown a significantly smaller proportion of admissions from GPs. In a st Hospital in week 23, summer 2003, Eikeland and collaborators found that only 12 % of the emergency admissions to th and gynaecological departments had been made by a GP (5).

Our study was conducted during a regular working week and only included admissions to the medical department. As fa have yet investigated whether the proportion of admissions made by GPs has increased since the introduction of the Re

Altogether 82 % of the patients were admitted to an inpatient ward; the others were assessed and treated in the receptio day. In general, a complete assessment and treatment in the reception, with no use of an inpatient ward, may be an appı for many patients. Often, the patient is admitted because the primary doctor is concerned that an acute exacerbation ma patients only need a clear diagnosis, a so-called diagnostic loop, and can be further followed up as outpatients or by the However, establishing a full diagnosis in the emergency reception requires a high rate of staffing with skilled personnel, patients correctly and to avoid excessive treatment time and general congestion in the emergency reception.

There is currently a debate unfolding over the organisation of the emergency receptions, widely recognising that increas safer as well as more effective patient pathways (18–20). In our study, for example, we observed that some patients with completed their treatment in the reception according to an algorithm that has later become better defined. This has grad among the primary doctors in the hospital's catchment area. It is assumed that similar algorithms, for example pertaini achieve more effective and safe patient pathways in the emergency reception.

Average hospitalisation time was 3.7 days. The corresponding figure for the entire year was 4.0 days (Einar Husebye, pe Hospitalisation times tend to be shorter in Norway than in other European countries; according to an OECD report fron days for all hospitalisations in Norway and 6.9 days in Europe as a whole (21). In general, hospitalisations are tending to as well as in virtually all other countries. This is primarily due to medical developments and pressure on beds and availa admissions increases. Furthermore, primary health services are now required to receive patients who are ready for disch

The diagnoses at admission corresponded relatively well with those at discharge in our study; this concurs with two larg undertaken in Norway (22, 23).

A little more than 20 % of the patients were admitted with a symptomatic diagnosis, while this figure had been approxir

In our review of the referral notes we found possible alternatives to hospitalisation for a little more than 13 % of the pati an alternative to hospitalisation was found to be appropriate for only one-half of those for whom this was relevant upon estimate of alternatives to admission, a correct identification of these patients would nevertheless help relieve the depar the assessments made upon admission and those made retrospectively after the hospitalisation period shows the degree identifying these patients in advance. This has also been the conclusion in other studies that have investigated opportun of unnecessary admissions (5, 9).

In many studies, the necessity of admission has been assessed post hoc, in light of the results of the examination and tre hospital (5, 9, 10). In our study, we have analysed the information available in advance as well as post hoc. We believe th criteria for admission, it is essential to use the medical assessment made prospectively as a basis, and then retrospective of the admissions is safe and medically sound.

We found little correspondence between the assessment of degrees of seriousness made in the reception immediately af alternatives to it. This shows that triage tools are unsuitable for this type of sorting. Traditional triage tools are primarily of urgency at the pre-hospital stage and in emergency receptions, yet it is still surprising to see such a weak correlation b alternatives to admission.

It seems evident that primary doctors who need to consider referral cannot use tools that have low sensitivity. For exam year assesses 300 patients with acute conditions and 50 of these have a real need of hospitalisation, even a sensitivity of patients would not be granted the admission they need. To keep this number as low as possible, the primary doctors wil number of patients for whom the further progression cannot be foreseen with any certainty. It is reasonable to assume t many hospital doctors feel that the primary doctors refer patients unnecessarily. If we use the same figures and assume decisions have a specificity of 90 %, the corresponding figure will be 70 admissions, whereof 25 will be unnecessary.

On the other hand, liberal referring practices on the part of the primary doctors will necessarily increase the burden on h accumulation of patients, for example in the emergency reception, may give rise to an increased risk of medical error an

We conclude that a minor proportion of the patients who are currently hospitalised (6–7 %) would have benefitted equa However, these patients are difficult to identify at the time of admission. Since the number of admissions is steadily incı important to establish better routines and methods to identify those patients who ought to be hospitalised and those wh from alternatives.

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