

Impact of quick Diagnosis Unit Integrated in an Emergency Department Setting

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Background

Hospitals in countries with public health systems have recently adopted organizational changes to improve efficiency and resource allocation, and reducing inappropriate hospitalizations has been established as an important goal, as well as avoiding or buffering overcrowding in Emergency Departments.

Aims

Our goal was to describe the impact of a Quick Diagnosis Unit (QDU) established on January 1, 2012, integrated in an Emergency Department setting in a Danish public university hospital following its function for the first $\frac{3}{4}$ of a year.

Design

Observational, descriptive and comparative study.

Methods

Our sample comprised the total number of patients with simple internal medicine ailments admitted and discharged the first $\frac{3}{4}$ of the year 2012 from the QDU integrated in an Emergency Department setting. The QDU accommodated 16 patients and was comprised of 10 beds and 6 ambulatory seats / chairs.

The sample was compared with the total number of general internal medicine ward patients admitted and discharged the first $\frac{3}{4}$ of the year 2011 from the hospital's general Department of Internal Medicine.

RESULTS: Over a period of 9 months a number of 4508 patients with simple internal medicine ailments were admitted and discharged from the QDU integrated in an Emergency Department setting. This amounts to ~500 patients admitted and discharged per month or a turnover of ~ 1 patient per accommodation (bed or seat / chair) per day.

Compared with the first ¼ of the year 2011 the establishment of the QDU integrated in the Emergency Department resulted in the admittance and discharge of 1139 fewer patients (41%; $p < 0.0001$) to the hospital's general Department of Internal Medicine.

Conclusions

A QDU integrated in an Emergency Department setting represents a useful and fast track model for the diagnostic study and treatment of patients with simple internal medicine ailments, and also serves as a buffer for overcrowding of the Emergency Department.

Keywords: Diagnosis; Hospitalization; Overcrowding, Emergency Department.

In recent years, hospitals in countries with public health systems have adopted organizational changes to improve efficiency and resource allocation.

¹ Alternative models of care include one-day hospitals (created primarily to provide medical procedures that require less than 24 hours of hospitalization),

² Short-stay observation units (areas often located adjacent to emergency departments that accommodate patients requiring brief periods of observation or therapy);

³⁻⁶ Hospital-in-the-home (programs that deliver a limited range of acute care services to selected patients in their homes);

⁴⁻⁷ Outpatient major surgery programs (the provision of surgical procedures with postoperative recovery periods short enough to permit same-day discharge);

⁸ And, more recently, Quick Diagnosis Units (QDUs)

⁹⁻¹² (Outpatient diagnostic units for patients with suspected severe diseases).

To our knowledge¹³ this is the first study regarding a QDU integrated in an Emergency Department setting primarily to treat patients with simple internal medicine ailments, i.e. typical general internal medicine ward patients.

On January 1, 2012 a QDU integrated in an Emergency Department setting was established at Holbaek University Hospital. Concomitantly a 56 bed general internal medicine ward in the vicinity was closed.

The QDU integrated in the emergency department setting

The QDU accommodated 16 patients and was comprised of 10 beds and 6 ambulatory seats / chairs physically integrated into the Emergency Department It was manned by a Chief Physician (specialist in internal medicine) and an intern during day time 08:00 – 16:00 h, 3 nurses and a secretary.

After 16:00 h to the following morning it was manned by physicians on call in the Emergency Department proper.

The Emergency Department had its own Point of Care laboratory (POCT) manned by 2 bio analysts from 10:00 – 22:00 h, as well as an x-ray facility. Additionally the Department of Radiology provided more advanced diagnostic procedures such as e.g. CAT scans or MRI scans on a fast track basis.

There was easy access to additional specialist evaluations from the Emergency Department staff or, albeit rarely, from various in house specialists. The POCT strategy may be viewed as a 3 tiered approach (Table 1).

| Approach | Analysis (plasma) |
|------------------------------|--|
| Tier 1: Electrolytes | Hemoglobin, Na, K, glucose, H ₂ CO ₃ , bilirubin, hematocrit, creatinine, Cl, pH value, pCO ₂ , pO ₂ , lactate, CO |
| Tier 2: Infection parameters | Leucocyte count, C-reactive protine |
| Tier 3 Fibrinolysis | D-dimer |

TABLE I: POCT strategy

Measuring time elapsed from blood sampling to analysis result has proved to be 53% to 84% quicker using POCT as compared to conventional laboratory analysis¹⁴, which is important for expeditious Emergency Department handling of patients.

Our current goal was to describe the impact of a QDU integrated in an Emergency Department on the number of admissions to the general internal medicine ward in a Danish public university hospital following its function for the first ¾ of the year 2012 as compared to the previous year.

Methods

Our sample comprised the total number of patients with simple internal medicine ailments admitted and discharged the first ¾ of the year 2012 from the QDU integrated in an Emergency Department setting.

The QDU accommodated 16 patients and was comprised of 10 beds and 6 ambulatory seats / chairs. The sample was compared with the total number of general internal medicine ward patients admitted and discharged the first ¾ of the year 2011 from the hospital's general Department of Internal Medicine.

Results

Over a period of 9 months a number of 4508 patients with simple internal medicine ailments were admitted and discharged from the QDU integrated in an Emergency Department setting. This amounts to ~500 patients admitted and discharged per month or a turnover of ~ 1patient per accommodation (bed or seat / chair) per day.

Compared with the first ¾ of the year 2011 the establishment of the QDU integrated in the Emergency Department resulted in the admittance and discharge 139 fewer patients (41%; $p < 0.0001$) to the hospital's general Department of Internal Medicine.

Fig 1 showed the monthly decline in admissions to the general ward of internal medicine following the

establishment of the QDU integrated in the Emergency Department setting as compared to 2011.

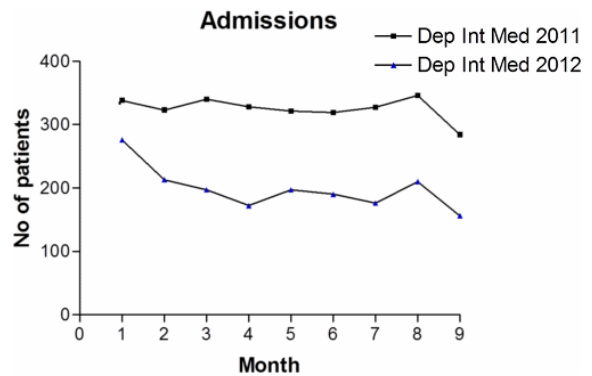


Fig 1: Admissions before and after implementation of the QDU

Discussion

The avoidance of admission to the general Department of Internal Medicine accounts for only a fraction of the QDU's actual turnover of admittances and discharges of patients, i.e. ~25% ($139/4508 \times 100$).

It is conceivable that the QDU integrated in an Emergency Medicine setting absorbed some of the 2000 patients which were admitted and discharged from a 56 bed internal medicine ward facility in the vicinity that was closed when the QDU facility was opened.

It is also possible that the establishment of the QDU in question has generated more referrals of patients from the primary health care sector. Further research is needed to accomplish clarification

Conclusions

Preliminary evaluations show that a QDU integrated in an Emergency Department setting represents a useful and fast track model for the diagnostic study and treatment of patients with simple internal medicine ailments, and also serves as a buffer for overcrowding of the Emergency Department.

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