

# A new model for neurology care in the emergency department

Rebekah M Ahmed, Timothy Green, Gabor M Halmagyi and Simon JG Lewis

**N**eurology is regarded by many doctors as one of the most challenging specialties,<sup>1</sup> and it has been estimated that 35% of hospital emergency department (ED) neurological diagnoses are revised after specialist neurological review.<sup>2</sup> Compounding these problems, there is limited availability of prompt outpatient neurological consultation, and even in capital cities it can be difficult for patients to see a specialist quickly, even privately, which in itself may act as a barrier to appropriate health care.<sup>3</sup>

One approach to tackle such problems has been the development of "fast-track" specialist outpatient services. A number of these services have been successfully developed in the United Kingdom across a range of specialties, taking referrals from general practitioners.<sup>4-6</sup> Here, we report the first 12 months of data from the ED Rapid Access Neurology (ED RAN) clinic, which we believe is a novel model for managing outpatients with neurological problems referred from the ED setting in Australia. This model could help ED physicians and limit unnecessary hospital admissions and, if successful, may provide a framework that could be expanded across other hospitals and specialties throughout Australia.

## METHODS

### Setting

Sydney's Royal Prince Alfred Hospital (RPAH) serves diverse socioeconomic and ethnic groups. It receives over 50 000 ED presentations per year and is a major tertiary referral centre for other hospitals in New South Wales. It is the only hospital in NSW with a specialist neurology registrar, supported by a consultant neurologist, available 24 hours a day, 7 days a week for ED patients with admissions directed to the neurology ward. Consultant staff members are salaried and receive no extra remuneration for offering telephone advice.

RPAH previously offered one public general neurology clinic serving all referral sources, with an average waiting period of 4 months for non-urgent referrals. Patients requiring urgent specialist neurological review would be admitted from the ED.

## ABSTRACT

**Objective:** To assess the feasibility of using a rapid access neurology clinic to assess and manage patients considered safe to discharge home from the emergency department (ED), yet requiring specialist neurology review.

**Design, setting and participants:** The ED Rapid Access Neurology (ED RAN) clinic was trialled at Royal Prince Alfred Hospital, a major tertiary teaching hospital in Sydney, over a 12-month period (23 March 2008 – 22 March 2009). The service uses a new clinic and referral system to offer suitable patients specialist neurology outpatient review within 5 working days of their discharge from the ED.

**Main outcome measures:** Quality of patient care, patient satisfaction, estimated service impact on the hospital system.

**Results:** During the 12-month trial period, 311 patients were referred to the ED RAN clinic. Of these referrals, 222 patients (71%) attended the clinic, where a number of serious neurological diagnoses were made, and eight patients required admission after specialist review. All patients attending the clinic found the visit helpful. Consultant ED physicians believed that the clinic prevented 83 unnecessary admissions and 188 out-of-hours neurology registrar consultations, and saved an estimated 809 hours of ED bed time.

**Conclusions:** The ED RAN clinic provides a viable model for improving the quality of patient care, with high levels of patient satisfaction. This model of care may allow significant cost savings and help to relieve the major access block in Australian EDs.

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### Referral mechanism

The ED RAN clinic was established at RPAH in March 2008, with a service model (Box 1) directed towards patients considered by the consultant emergency physician as safe for discharge, knowing that they would be offered specialist neurology review within the next 5 working days. All referral decisions were based on clinical judgement rather than any prescriptive algorithms, and conditions such as transient ischaemic attack or first seizure were not excluded. The ED RAN clinic was conducted once a week as a public outpatient clinic.

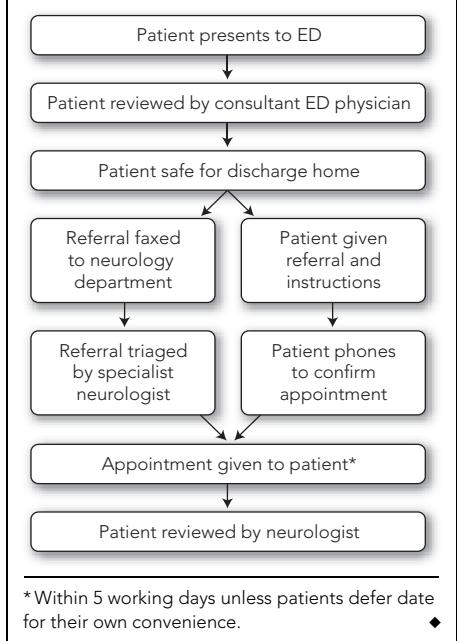
After patients were reviewed by the consultant ED physician on duty, referrals to the ED RAN clinic were made by fax, using a standardised referral template available on the hospital intranet. This contained brief clinical and demographic details and was supplemented by the ED discharge summary. Patients were given the original referral form and instructed to contact the neurology department as soon as possible to make an appointment.

To assess this pilot study, RPAH supported a 0.2 full-time-equivalent consultant appointment, but existing administrative staff and neurology outpatient services absorbed the extra demands required by the ED RAN clinic while the service was being evaluated.

### Quality of patient care

All referrals made to the clinic were reviewed by a specialist neurologist each morning and, where there was felt to be an

#### 1 Service model for the Emergency Department (ED) Rapid Access Neurology clinic



## 2 Diagnoses of eight patients requiring admission after urgent review in the ED RAN clinic

Diagnosis	No.
Guillain–Barré syndrome	2
Transverse myelitis	1
Stroke	1
Benign paroxysmal positional vertigo	1
Myasthenia gravis	1
Meningioma	1
Myopathy	1

ED RAN = Emergency Department Rapid Access Neurology.

## 3 Diagnoses in 222 patients presenting to the ED RAN clinic

Diagnosis	No.
Seizure/syncope	50
Headache	45
Lower motor neurone facial weakness	36
Vertigo	27
Neuropathy	25
Stroke/transient ischaemic attack	17
Psychogenic	6
Myasthenia gravis/myopathy	4
Demyelination	3
Musculoskeletal	3
Parkinson's disease	2
Neurosurgical (meningioma)	2
Other*	2

ED RAN = Emergency Department Rapid Access Neurology. \*Transient global amnesia, drug reaction.

urgent clinical need for review, patients were contacted directly. Otherwise, appointments were made when patients phoned to arrange them. This triage mechanism also facilitated the advance arrangement of suitable specialist investigations (eg, electroencephalography and vascular Doppler studies).

### Patient satisfaction

Patient satisfaction was assessed by asking patients to complete a survey after their review in the ED RAN clinic.

### Estimated service impact on the hospital system

On each patient's referral form, consultant ED physicians were asked to complete a section indicating whether they felt the availability of the ED RAN clinic: had no impact on patient management; allowed safe and timely patient disposition; avoided the need to consult with a neurology registrar; avoided unnecessary admission; and/or resulted in any estimated reduction in ED admission time.

## RESULTS

### Quality of patient care

During the 12-month period, 311 patients were referred to the ED RAN clinic. Of these referrals, 222 patients (71%) attended the clinic, and nine patients (3%) failed to attend after having made an appointment. All patients were offered an appointment within 5 working days of contacting the service, although four patients deferred this appointment date for their own convenience. After triage of their referrals by a consultant neurologist, eight patients were

urgently assessed prior to their scheduled ED RAN clinic appointment and admitted on the basis of clinical need (Box 2). None of the 80 patients (26%) who failed to contact the ED RAN service for an appointment were subsequently readmitted through the ED.

The clinic received a wide range of referrals including a number of rare and complicated neurological diagnoses requiring rapid specialist review (Box 3). A number of diagnoses made in the clinic had not been considered in the ED (eg, myasthenia gravis and Guillain–Barré syndrome), whereas others had a more specific characterisation of their syndromic diagnosis made (eg, classic migraine presenting with headache, and benign paroxysmal positional vertigo presenting with dizziness).

### Patient satisfaction

All 222 attending patients completed the survey after their visit to the ED RAN clinic. As shown in Box 4, patient satisfaction ratings of the ED RAN service were extremely high.

### Estimated service impact on the hospital system

Of all 311 referral surveys completed by the experienced ED consultant physicians, only three (1%) indicated that the ED RAN clinic had no impact on the management of the patient. Overall, the ED consultants believed that the ED RAN clinic had prevented 83 admissions and 188 out-of-hours neurology registrar consultations, and saved an estimated 809 hours (equating to over 33 days) of ED bed time. Eight patients referred to the ED RAN clinic were subsequently

## 4 Results of survey completed by 222 patients attending the Emergency Department Rapid Access Neurology clinic

Question	Yes	No	Not sure
Did you have any difficulty in making your appointment?	4 (2%)	218 (98%)	0
Have you needed to seek medical attention for your current symptoms in the period between your discharge from the emergency department and this appointment?	28 (13%)	194 (87%)	0
Had you sought medical attention for your current symptoms prior to referral from the emergency department for this appointment?	70* (32%)	152 (68%)	0
Would you have preferred to remain in hospital for assessment rather than attending the Rapid Access Neurology Clinic?	4 (2%)	197 (89%)	21 (9%)
Did you find this visit to the Rapid Access Clinic helpful?	222 (100%)	0	0
Was the information you received useful?	222 (100%)	0	0
Did you feel all your questions were answered?	221 (99.5%)	1 (0.5%)	0
Was the information given in an easy to understand manner?	222 (100%)	0	0
Do you understand what will happen next as a result of your visit here?	221 (99.5%)	1 (0.5%)	0

\* Medical attention sought from: general practitioner (62), emergency department (4), cardiologist (2), ear, nose and throat surgeon (1) and ophthalmologist (1).

admitted; ED physicians had reported the discharge of four of these patients as having prevented an admission to the hospital. Finally, 85% of the referrals to the ED RAN clinic (264/311) were made outside normal working hours.

## DISCUSSION

Although this was an observational study with no control arm, our experience suggests that the ED RAN clinic offers considerable improvements in the quality of care that neurology patients receive. A number of significant diagnoses were made by specialist review without undue delay, and this rapid access service, coupled with no out-of-pocket expenses for patients, was felt to have increased patient attendance rates.

The correct neurological diagnosis had not been considered before specialist assessment in most of the patients who were subsequently admitted from the ED RAN clinic, and it is possible that their symptoms and signs had become more obvious in the time between discharge and specialist review. Only 13% of patients had consulted with their GP or other specialist before their ED RAN clinic appointment, and none of these consultations had resulted in admission to hospital. This finding suggests that, in addition to the ED RAN clinic allowing for the detection of significant diagnoses, there was also little risk of dramatic clinical deterioration during the interval before assessment.

Discharge without an appropriate explanation for symptoms is a common cause for revisiting the ED,<sup>7</sup> and the ED RAN clinic specifically addressed this issue by providing patients with an opportunity for rapid specialist review. Furthermore, with 85% of referrals occurring out of normal working hours, the ED RAN clinic appears to provide

support to ED staff at a time when there is often less specialist knowledge and experience available.

We cannot be sure why 26% of patients failed to make an appointment, but it is possible that they sought review elsewhere. This proportion of non-attenders is in keeping with that reported in the literature, where patient-perceived difficulty of getting to the hospital has been suggested as the major reason.<sup>8</sup>

Nearly a third of ED RAN clinic patients had previously sought medical attention for their presenting complaint from another doctor, most commonly their own GP. Continuing concerns about their condition may have led them to present to the ED for further reassurance. Therefore, it is likely that the ED RAN service model could be successfully expanded to provide support to GPs by allowing them to offer their patients rapid specialist review in the outpatient setting. Provided that there were no significant barriers to accessing care, this approach could even be coordinated through neurologists in private practice, thus helping to relieve the increasing pressures being placed on the ED.

While the main aim of establishing the ED RAN clinic was to provide a better service to patients, our experience also suggests that, despite having to factor in additional staff and service costs, this model of care may offer potentially significant cost-saving opportunities. By reducing the admission rate for neurology patients in the ED, out-of-hours neurology registrar consultations, and time spent by patients in the ED, the service may also help to address the major problem of access block faced by most public hospitals in Australia. We believe that this model is worthy of further socioeconomic review.

## COMPETING INTERESTS

None identified.

## AUTHOR DETAILS

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