Safety and efficiency of non-contact first specialist assessment in neurology

Pietro Cariga, William H C Huang, Annemarei Ranta

Abstract

Aim To investigate safety and efficiency of non-contact first specialist assessments (NCFSA) in neurology.

Methods Out of a cohort of 1107 patients referred to a neurology clinic, a total of 222 (20%) was triaged into NCFSA and investigated with a 6 months observational study of safety and efficiency indicators.

Results There were three (1.35%) adverse events (delay in diagnosis) recorded, one of which with actual detriment to the patient. After 6 months the rate of re-referrals was 11.26%, and inpatient admission rate 5.86%.

Conclusions There is a potential for NCFSAs to optimise the use of available resources in a neurology outpatient setting with low risk of delay in diagnosis.

Non-contact first specialist assessments (NCFSAs) offer an opportunity to improve access to a specialist service when resources are limited, but safety and efficiency have not been established in a general neurology outpatient setting. As NCFSA strays from the traditional face-to-face history and examination assessment of safety, quality, and cost-effectiveness is paramount.

The NCFSA is based on specialist advice given according to clinical history and findings as reported by the referring practitioner, and it can be defined as a form of store-and-forward telemedicine. Whilst telemedicine is described as safe and efficient in a variety of specialties, concerns have also been raised.1–3 This matters particularly in neurology, which heavily relies not only on expert interpretation of clinical history, but also neurological examination findings.

Several studies investigated aspects of neurology consultations via video-link,4–9 but there is limited data regarding NCFSA in neurology.10–12 This article describes a 6-month observational study of safety and efficiency for a large cohort of outpatients referred to a general neurology clinic and triaged into NCFSA.

Methods

All new referrals to the neurology clinic of a mid-sized regional New Zealand hospital between July 2008 and August 2009 were included in the study and triaged by a neurologist into one of the following options: accepted for face-to-face appointment, returned because of insufficient information, forwarded to more appropriate specialty, or allocated to a NCFSA.

Formerly known as “virtual specialist assessment” or “virtual clinic”, NCFSA is a service approved and funded by New Zealand Ministry of Health in order to improve access to specialist advice when resources are limited.13

For all NCFSAs the triaging neurologist considered the clinical details and physical findings described by the referrer as well as available hospital records. Following assessment the neurologist issued a letter to the referrer containing a clinical summary and the diagnostic and/or therapeutic plan deemed
most appropriate. Diagnostic tests or treatments not accessible by the referring practitioner were organised by the triaging neurologist, who also informed the patient of the recommended test(s) by letter.

All NCFSAs were grouped according to the chief complaint: for example “funny turns”, “vacant spells”, and driving privilege issues in patients with diagnosis of epilepsy were all grouped as “seizures” (Table 1). One and 6 months after NCFSA the following outcome measures were recorded: re-referral rate, inpatient admission (if relevant to the neurological symptoms), and delayed or missed diagnosis of a neurological disorder with or without impact on the patient’s well-being. A 6 months observation was chosen for this study mainly because New Zealand Ministry of Health guidelines require all referrals to be either assessed or returned within that time limit.14

Results

Out of 1107 outpatient referrals (Figure 1) triaged 802 (72.5%) were allocated a face-to-face appointment and 83 (7.5%) were returned to the referrer with a letter indicating the reason (i.e. insufficient information for reliable triage), or forwarded to non-neurological specialties. Referrals triaged into a NCFSA were 222 (20%). The neurologist generally triaged into NCFSAs referrals less likely to underlie a serious neurological disorder. On average a NCFSA took 15 minutes of neurologist time, including the time for triage. A typical appointment in a face-to-face clinic in the same hospital is allocated 45 minutes.

For NCFSAs the most frequent problem was headache (37%) followed by seizures (13%), and others as shown in Table 1.

Table 1. Main clinical concern for referrals triaged to NCFSA

<table>
<thead>
<tr>
<th>Clinical Concern</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headache syndromes</td>
<td>37%</td>
</tr>
<tr>
<td>Seizures/funny turns</td>
<td>13%</td>
</tr>
<tr>
<td>Movement disorders</td>
<td>4%</td>
</tr>
<tr>
<td>Dizziness/vertigo</td>
<td>4%</td>
</tr>
<tr>
<td>Chronic non-headache pain</td>
<td>3%</td>
</tr>
<tr>
<td>Memory/concentration</td>
<td>2%</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>37%</td>
</tr>
</tbody>
</table>

Of all referrals triaged for NCFSA 77% had been sent by a general practitioner, 20% from hospital departments, and 3% by private physicians. A total of 30 tests was recommended for 22 (10%) NCFSAs.

Within 1 month following NCFSA 5 (2.25%) patients were re-referred to the neurology clinic, and the total increased to 25 (11.26%) at 6 months (Figure 1). Most patients re-referred within 1 month (4/5) and 6 months (17/25) were triaged to a face-to-face clinic appointment upon reception of the second referral.

There were 4 (1.8%) inpatient admissions for symptoms relevant to the original referral in the first month following NCFSA, increasing to 13 (5.86%) at 6 months. None of the admitted patients were diagnosed with a neurological condition.
Three (1.35%) adverse events were recorded, one of which with actual impact on the patient’s well-being. The involved patient had been referred for “atypical migraine, resolved within 24 hours, normal head CT and normal lumbar puncture” (images and formal report were unavailable at the triage).

The following month the patient’s general practitioner described recurrent headache and unilateral proptosis, and MRI of the brain advised by the neurologist detected a skull base meningioma. With retrospect it was found that the CT scan report described “bony lesions” but this was omitted from the original referral.

The other two adverse events included a case of idiopathic intracranial hypertension (treated within 6 months without detriment to the patient) and a polyneuropathy diagnosed by nerve conduction studies (eventually requested by the general practitioner) within 6 months, without the patient showing deterioration or missing out on any substantial treatment.

**Discussion**

This study has shown that a significant proportion (around 20%) of new referrals to a neurology clinic can be treated safely as NCFSA. This may not only improve the capacity for non-urgent appointments, but also increase resources and reduce waiting time for more urgent referrals.

Limited access to face-to-face specialist assessment has prompted the exploration of alternative methods over the years. Consultation by video-link is reported to be as safe as face-to-face consultation for neurology patients, but a cost analysis concluded that it is more expensive and it generates more investigations. This suggests that real-time neurology consultations via video-link should be limited to areas where geographical factors make access to specialty services impractical. However there is little data on less expensive non-contact assessments aimed at improved resource utilisation rather than overcoming geographical barriers.
The low number of recorded adverse events within 6 months demonstrates good safety levels for the NCFSA methodology described in this study. A limitation to be acknowledged is the possibility of adverse events not being captured (such as conditions diagnosed in the private sector or outside the region): however this is unlikely to be meaningful because there are no other public or private neurologists in the region, and a very good communication network between the relatively few neurologists in the country exists that would highlight adverse events outside the region.

Furthermore, if the same patients had been triaged into face-to-face appointments the number of adverse events would be expected to have been equal or higher as the waiting time would have been about 6 months, at which point all three recorded adverse events would have already occurred. Recommendations from NCFSA are generated much more quickly and thus may have prevented complications in some patients. Additional indicators of efficiency and cost-effectiveness are the overall low number of patients re-referred to the clinic or admitted, and the low number of investigations arranged.

Measures taken to minimise clinical risk included triage by consultant neurologist, selection of cases with low suspicion of serious pathology, encouraging referrers to relay additional concerns, and high rate of acceptance of re-referrals for face-to-face assessment. Despite such measures, adverse events still occurred. This differs from previous findings by Paterson and colleagues investigating an e-mail based triage of referrals from general practice with similar outcome measures to this study. They observed that most patients referred to a neurology clinic (57% in a first cohort and 66% in a second cohort of 76 patients each) could be managed by email without any deaths or significant changes in diagnosis after 6 months, resulting in a 44% saving on neurologist’s time and high satisfaction from general practitioners.

The present study in a larger cohort of patients (n=1107) recorded adverse events despite more selective triage (20%). Furthermore, referring general practitioners were pre-selected for the observational study by Paterson and colleagues, raising the possibility of a selection bias. Whilst both groups found good overall safety, the present study suggests that indiscriminate or inexperienced use of NCFSA could present risks of misrecognising serious disorders. A trial randomizing neurology outpatients into NCFSA or face-to-face clinic is warranted.

Finally, impact on public and professional culture must be considered. The use of NCFSA provides several benefits. These include rapid diagnosis, reducing waiting time for more urgent cases, promoting referrers’ familiarity with common neurological disorders through more immediate involvement, and raising public awareness that healthcare resources are not unlimited.

On the other hand potential pitfalls must be addressed. Patterson suggested that neurology (being prominently based on interpretation of clinical history) is particularly suitable for non-contact management and queried why it has a slow uptake compared to other specialties. However, the same characteristic can generate reservations in the neurologist who has to rely on a non-specialist reporting symptoms and signs, and in the referring physician who will be the only one examining the patient. Legal aspects have also been the subject of controversy.
Neurologists could see their scope alienated by being denied the stimulating challenge of taking a knowledge-driven history or skilful physical examination. Private providers could see it as a potential income threat. Patients could perceive NCFSA as not being given due consideration. In conclusion, this study shows that NCFSAs are safe and efficacious in neurology. Additionally it may also provide a template for other specialties making a significant use of NCFSA in order to audit their own long-term data. The issue of public and professional acceptance needs to be studied further.

Competing interests: None.

Author information: Pietro Cariga, Neurologist; William HC Huang, House Officer; Annemarei Ranta, Neurologist, Department of Neurology, Palmerston North Hospital, Palmerston North

Correspondence: Pietro Cariga, Private Bag 11036, Manawatu Mail Centre, Palmerston North, New Zealand. Fax: +64 (0)6 3508391; email: pietro.cariga@midcentraldhb.govt.nz

References: