

The concept, delivery and future of medical ambulatory care

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ABSTRACT – Bed shortages, efficient modern diagnostic services and increasing risks associated with hospital admission, require review of conventional medical practice. Patients referred as emergencies who are walking, talking sense, eating and drinking and have normal sphincter function can usually be managed as outpatients. Widespread adoption of this practice would require more general physicians and nurse practitioners near the front door, rapid access and early review clinics and prompt diagnostic support. Education of the public, changes in medical training and reallocation of resources would reduce the need for inpatient management, providing beds for those in real need.

KEY WORDS: ambulatory care, outpatient management

Concept

An editorial in *The Times* on 13 August 2004 contained the following statement:

*By any standard, the finding that 72,000 people die each year in NHS hospitals in part as a result of avoidable mistakes by hospital staff is deeply troubling.*¹

I believe that most patients referred as emergencies who are walking, talking sense, eating and drinking and have normal sphincter function can be managed as outpatients. These simple criteria for ambulatory care are based on years of practice as a general physician in South Africa, where large numbers of patients made outpatient management essential. Most doctors are aware of features requiring careful observation, circulatory or ventilatory support, or regular neurological observation, but many are unaware of criteria suggesting that management at home may be safe and far more pleasant for the patient than inpatient care. It seems particularly inappropriate to keep patients in hospital awaiting investigation if they do not require inpatient treatment. This does not mean that the patient can be discharged without review but suggests that outpatient management is appropriate. Important exceptions include acute coronary syndromes, some patients with pulmonary

embolism (PE) and subarachnoid haemorrhage (SAH) where, especially if the patient presents late, care is needed near the front door.

The advent of low molecular weight heparin was a milestone in medical management, enabling outpatient investigation and treatment for many patients and led to the opening of a medical day unit (MDU) at the Royal Glamorgan Hospital, a district general hospital with 490 beds, 189 of which are medical, serving a population of approximately 188,000. This provided a venue for assessing patients who, from the information provided by referring doctors, could be considered for ambulatory care. Modern laboratories provide the results of most commonly requested investigations within one or two hours and the support of the radiology department was a precondition for developing the service.

Delivery

The main responsibilities of an acute care physician are to identify patients who can be managed safely as outpatients, to discharge them on the same day after arranging appropriate management and to recognise those who need urgent attention, seeking help on site or at a tertiary centre. The Royal Glamorgan Hospital has 17 specialists involved in general medical intake. The staff of the acute medical service comprise a consultant who has worked as a general physician for 32 years, a specialist registrar or senior house officer (depending on departmental work shifts) and a pre-registration medical officer. There is also a nurse practitioner who runs the MDU, a ward with three trolleys and three reclining armchairs, staffed by four staff nurses.

Patients are referred to hospital, from the emergency department (ED) or by their general practitioners (GPs), to bed managers (experienced senior nurses, who direct the patients to the appropriate departments). Patients are admitted after a discussion by telephone. Referrals are not accepted by fax or letter, because the service is for acute problems only.

If patients are discharged on the day of arrival it may be necessary to review them within a few days. Three rapid access/early review clinics are provided weekly, all in the morning, and five hours are available if necessary (8.30 am to 1.30 pm). Patients

discharged on the day of arrival can be reviewed daily from Monday to Friday on the MDU. This is an important safety net and is one reason why patients in conventional practice are kept in hospital; there is natural concern that they can not be reviewed earlier, because of pressure on specialist clinics. Knowing that a consultant will review them in the near future is very reassuring to patients discharged on the day of arrival and to their relatives.

A traffic light system has been developed for the ED which does not have a physician. Patients in the red category are seen within 24 hours; those in the amber category within three days; and those in the green category are referred to their GP. Red and amber forms with questions, check lists and tick boxes appropriate for the different conditions, are available for completion by the ED staff before referral to the acute care team. Patients classified as red are seen by the medical registrar when the acute care staff are unavailable. Although some of the conditions may require admission, their investigation and management can often be expedited by the acute medical services staff. The lists are not comprehensive but are intended as guidance on conditions which have been managed successfully and repeatedly in outpatients. Referral depends on the experience and resources of a particular practice. The traffic light system was introduced to two local general practices in 2007 with prospects for growth. Table 1 indicates patients in the red and amber categories. In conventional practice, many of these patients would be admitted and would wait several days for the definitive investigation and appropriate

management. A considerable amount of time in acute medicine is spent excluding serious disease, such as possible venous thromboembolism (which can often be done as an outpatient) and possible SAH (which can often be done in less than 24 hours).

It is much easier to admit patients than to discharge them on the day of arrival because a diagnosis must be made within a few hours or a clear management plan developed with investigations, liaison with other departments on site or elsewhere, prescription and collection of drugs and dictation of a discharge summary. There is a common perception that patients admitted to hospital are safer. It may not be in the patients' best interests, however, to be in hospital, where serious infection may be acquired, surroundings are unfamiliar and noise and light may disturb over 24 hours, if they are stable and can be managed at home. Admissions on Friday afternoons and just before public holidays require special scrutiny, as definitive investigations may take even longer than usual.

In the first five years at the Royal Glamorgan Hospital, 4,303 patients were seen by the acute medical service: 4,095 (95%) were managed as outpatients, 208 (4.8%) were discharged after an overnight stay and 24 (0.5%) were admitted for more than one night.

Examples of practice

The following brief case histories exemplify how patients referred as emergencies have been managed at home. In

Table 1. Traffic light system: referral to the acute medical services.

RED – urgent, to be seen within 24 hours

- Transient ischaemic attacks
- First seizure associated with neurological deficit or symptoms or signs of raised intracranial pressure
- Neurological deficit with Glasgow Coma Scale score of 15/15
- Neurological presentations on anticoagulant therapy, eg warfarin or low molecular weight heparin
- Anaemia Hb <8.0 g/dl, in the absence of angina or overt heart failure
- Hemiplegic migraine
- Headache, when cranial (temporal) arteritis is likely
- Coffee-ground vomitus
- New onset atrial fibrillation without chest pain, heart failure or debilitating stroke
- ?Pulmonary embolism
- ?Subarachnoid haemorrhage (SAH), ie when SAH requires exclusion, because it is possible but seems unlikely. When the features are typical, the patient should be admitted
- Symptomatic hypertension, not associated with debilitating stroke, hypertensive heart failure, or unstable angina
- Syncope or palpitations in a patient known to have ischaemic heart disease, who has had coronary artery surgery recently, or who has aortic stenosis
- ?Malignancy, primary or metastatic. Patients well known to another consultant should be referred back

AMBER – to be seen within 72 hours

- Unsteadiness, if recent in onset and not associated with frequent falls
- Anaemia; Hb >8.0 g/dl
- First seizure, no neurological deficit or raised intracranial pressure
- Palpitations as long as no serious arrhythmia eg ventricular tachycardia. Young, or previously fit people with a single episode of palpitation, with normal physical examination, normal chest X-ray and electrocardiogram and basic blood tests, should be referred to their general practitioner
- Weight loss
- Syncope, in young people, <60 years. If recurrent and no cardiac history

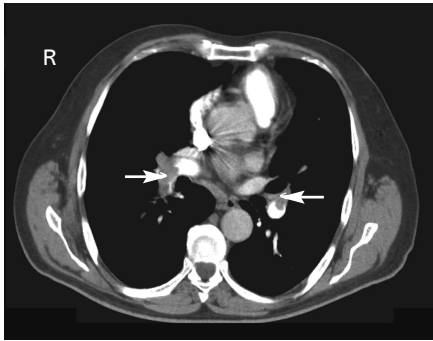


Fig 1. Computed tomography pulmonary angiogram. Thrombus is seen in both main pulmonary arteries.

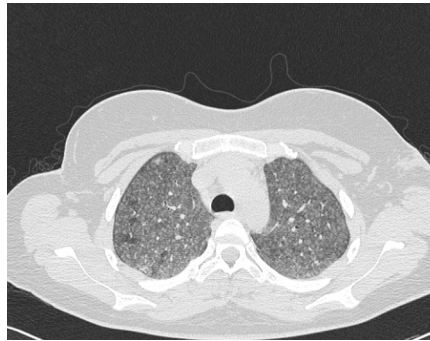


Fig 2. High resolution computed tomography scan of chest. Centrilobular ground glass appearance with darker areas of air trapping. Extrinsic allergic alveolitis.

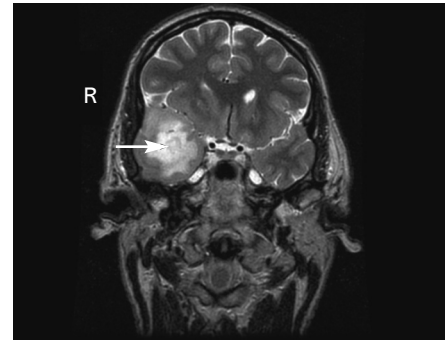


Fig 3. Magnetic resonance imaging scan of head. The tumour is in the right temporal lobe.

conventional practice, it is likely that all of them would have been admitted.

Pulmonary embolism

A 70-year-old man complained of weakness for 10 days. Two days earlier he had noted breathlessness associated with near syncope and had rested at home. He had undergone a total right knee replacement five weeks previously. On examination, he was stable haemodynamically and his chest and heart were unremarkable. His right leg was swollen from the thigh downwards. Pulmonary embolism was suspected. A chest X-ray showed diminished vascular marking in the right lower zone and arterial blood gases (ABG) were as follows: pH 7.4, partial pressure of oxygen (PO_2) 10.3 kPa, partial pressure of carbon dioxide (PCO_2) 4.2 kPa. An electrocardiogram (ECG) was identical to the recording done three months previously at his pre-operative assessment and was unremarkable. A computed tomography pulmonary angiogram (CTPA) confirmed PE bilaterally (Fig 1) and Doppler venography confirmed a deep vein thrombosis (DVT) above the right knee. Heparin was started and he was discharged. He returned to the hospital daily for enoxaparin injections until therapeutic anticoagulation was obtained with warfarin. He recovered fully.

Over a five year period, 150 patients with possible PE were seen. Of the 24 confirmed cases, 14 were managed as outpatients and four were discharged after an overnight stay. The diagnosis was confirmed by CTPA in 13 and by isotope lung scan in five. Of the 18 discharged early, four were readmitted within six months. Readmission was not related to venous thromboembolism or haemorrhage. Pulmonary embolism can be managed out of hospital if patients are stable haemodynamically and are not disabled by hypoxia.^{2,3,4}

Extrinsic allergic alveolitis

A 29-year-old housewife was referred for exclusion of PE on Christmas Eve. She complained of increasing breathlessness for three months following a move to a new home. She had received three courses of antibiotics without improvement following a

report of right middle lobe consolidation five weeks earlier. Her respiratory rate was 36/min and showers of inspiratory crackles were heard over the lower third of her lungs. Spirometry showed a restrictive pattern, ie forced expiratory volume in one second (FEV_1) 1.53/forced vital capacity (FVC) 1.67–91.6%, the predicted values being – FEV_1 2.34, FVC 2.73. Extrinsic allergic alveolitis was diagnosed and was attributed to caged birds, which had been sharing the kitchen since the move. A chest X-ray showed a faint ground glass appearance and a high resolution chest CT confirmed extrinsic allergic alveolitis (Fig 2). Her ABG showed type 1 respiratory failure with a PO_2 of 9.7 kPa, which rose to 12.8 kPa on 28% oxygen. This was the concentration provided for short-term domestic use by local pharmacies. She was discharged receiving prednisolone and domestic oxygen and recovered rapidly at home over Christmas, avoiding a stay of several days. Avian precipitins were found in her blood and the caged birds were removed from the house.

Brain tumour

A 56-year-old man was referred at noon on a Friday by the nurse at his workplace because of amnesia, noted when he asked the same question three times. He had been well the previous day and had driven to work without mishap, but had recently noted an unexpected metallic taste. Physical examination was normal apart from a complex partial seizure during the consultation. Temporal lobe disease was suspected and he had a computed tomography head scan the same day, showing an abnormality in the right temporal lobe and went home receiving carbamazepine. He returned for a magnetic resonance imaging head scan four days later and was admitted to the regional neurosurgery unit from home one week after presentation, for biopsy and debulking of the right temporal glioma (Fig 3).

Over five years, 40 patients with a brain tumour were seen by the acute medical service in the Royal Glamorgan Hospital. Of these, the tumour was metastatic in 21 and primary in 19 (11 malignant and 8 benign). Of the 40 patients, 33 were assessed and referred to a tertiary centre as outpatients; five stayed overnight, one stayed for two days before referral and one required admission for rehabilitation.⁵

Transient ischaemic attack

A 76-year-old right-handed man was referred with a history of two episodes of right-handed weakness, lasting for five minutes. On examination, he had recovered fully and had carotid bruits. Bilateral carotid Doppler studies were done immediately, showing internal carotid stenosis >90% on the left and stenosis of <30% on the right side. Immediately after the Doppler studies he was seen by a vascular surgeon in clinic, and had a left carotid endarterectomy two weeks later. He received aspirin and dipyridamole retard prior to surgery. His visit to the hospital lasted three hours.

Over five years, 131 patients presented with a transient ischaemic attack (TIA); 18 had significant carotid disease and were referred for surgery. Of the 18, 17 were assessed preoperatively as outpatients and one, who had a recurrent TIA on antiplatelet treatment, was admitted to expedite surgery. A TIA due to significant internal carotid stenosis is the neurological equivalent of unstable angina and requires urgent attention.⁶

In summary, of the 83 patients mentioned above, referred as emergencies (PE (24), extrinsic allergic alveolitis (1), brain tumour (40) and TIA (18)) 65 (78%) were assessed entirely as outpatients, nine were discharged after an overnight stay, and one was discharged after a stay of two days.

The future

Many more patients referred as emergencies could be managed as outpatients. Achieving this on a large scale would require a radical change in the way medicine is practised, with greater emphasis on rapid assessment, diagnosis and early review when necessary. Experienced physicians are needed near the front door, including the ED, to decide whether or not admission is required, to request relevant investigations or treatment and to arrange appropriate review for those discharged.

Nurse practitioners could be given more responsibility under supervision; experience at the Royal Glamorgan Hospital suggests that they will rise to the challenge. They become expert in their chosen fields, remaining there for years rather than changing after a number of months and take great pride in what they do. At the Royal Glamorgan Hospital, there are nurse practitioners in cardiology, respiratory medicine, diabetes, gastroenterology and acute medicine. The MDU nursing staff are responsible for the initiation of warfarin for patients with atrial fibrillation or venous thromboembolism in addition to their other duties.

Since acute medicine requires a breadth of knowledge and experience, more general physicians are needed. The advice of specialist colleagues can be obtained when necessary. Specialists should be able to identify patients with conditions in their

specialty who can be considered for ambulatory care. The consultant physicians at the Royal Glamorgan Hospital have developed written guidelines for early discharge and this should be done nationally.

Since confirmation and exclusion of so many conditions is possible with modern imaging and laboratory support, more trained ancillary staff and adequate equipment are needed to provide diagnostic services 365 days a year.

There is an urgent need for educating health professionals and the general public about the suitability and benefits of ambulatory care for many more patients. A government lead in this respect would be welcome. Management at home is usually more pleasant and is often safer than in hospital. If existing hospitals had better resources, the development of ambulatory care would lessen the need for expensive new hospitals and reduce the risk of life-threatening infections.

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