New-onset epilepsy is increasingly being reported in older people so the symptoms, which differ from those in young people, must be recognised to prevent misdiagnosis.

Identifying and managing epilepsy in older adults

In this article...

- Why older people are more likely to develop epilepsy
- Why it can be difficult to diagnose epilepsy in this age group
- Old and new drug treatments and how they work

Seizures occur when a sudden excess of electrical activity passes through the brain.

Keywords: Epilepsy/Seizures/Older people/Quality of life

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Seizures and epilepsy

The brain is a highly complex structure composed of millions of neurons (nerve cells that pass messages to each other). All its functions, including thoughts, emotions, actions and sight depend on electrical signals being passed from one neuron to the next in an orderly fashion. When a seizure occurs, this order is disrupted; the abnormal area of the brain discharges inappropriately and causes a sudden burst of excess electrical activity, which passes through brain tissue, leading to a temporary breakdown in normal messaging between neurons and a cessation of function. If these seizures are recurrent, the patient is diagnosed as having epilepsy. Recurrent seizures underpin the diagnosis of epilepsy – a single seizure does not necessarily result in a diagnosis of epilepsy; there must be a history of recurrence.

There are many different types of seizures. If the electrical depolarisation (change in the electrical activity of the cell membrane) is limited to a local area of the brain, it is known as a partial seizure. If the electrical activity crosses the midline to the other side of the brain, the seizure is a generalised seizure and leads to loss of consciousness. Occasionally, seizure activity may start as local disruption, then extend to involve the whole brain; this is known as a partial seizure with secondary generalisation.

When epilepsy begins in later life it is most likely to present as simple partial
seizures (Johnston and Smith, 2007), with or without secondary generalisation. These seizures do not affect consciousness; patients remain alert and may experience involuntary limb movements, twitching, unusual feelings, tastes or sensations. In complex partial seizures, consciousness is affected and the person may have only limited or no memory of the event, as well as involuntary movements.

Some people with epilepsy report that certain triggers may bring on their seizures, such as drinking too much alcohol, febrile illness (such as urinary tract infection), skipping meals, poor sleep and stress or anxiety.

Causes of epilepsy in older people

A range of diseases are associated with new-onset epilepsy in older people. Stroke, dementia and tumours were identified as the most common causes in two landmark studies. Stroke is the most important risk factor for epilepsy and can account for around two-thirds of cases. Epilepsy is also seen in patients who have cerebrovascular disease (CVD) but no history of stroke.

Dementia is the second most common cause and is responsible for 10-20% of all cases. Among the different types of dementia, patients with Alzheimer’s disease are up to 10 times more likely to develop epilepsy than those without; this increases as the dementia progresses (Brodie et al, 2009).

Between 10% and 20% of seizures are associated with tumours; those most commonly found to produce seizures in later life are gliomas, meningiomas and metastases. Older people have an increased risk of falls, and head injury and trauma account for up to 20% of cases of epilepsy in this age group. Brain concussion, skull fractures, loss of consciousness or amnesia for more than one day and an age of 65 years and over, have all been identified as risk factors for developing epilepsy following head injury (Brodie et al, 2009).

As a result of this, an underlying cause should be sought in all older patients presenting with epilepsy although, in some cases, this may never be determined (the so-called cryptogenic). However, research has shown that older people with CVD were 35% more likely to develop new-onset epilepsy than those without (Pugh et al, 2009). It may be, therefore, that cerebral microvascular disease is responsible for most unknown causes of epilepsy in older people, as risk factors for cerebrovascular disease such as diabetes, hypertension, heart disease, alcoholism, and chronic kidney disease, are more common in old age.

**TABLE 1. DIFFERENCES IN SEIZURE PRESENTATION**

<table>
<thead>
<tr>
<th></th>
<th>Older people</th>
<th>Younger people</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seizure incidence</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Location of focus</td>
<td>Parietal/frontal</td>
<td>Temporal</td>
</tr>
<tr>
<td>Generalised seizures</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Structural lesions</td>
<td>More</td>
<td>Fewer</td>
</tr>
<tr>
<td>Aura</td>
<td>Fewer</td>
<td>More</td>
</tr>
<tr>
<td>Automatism</td>
<td>More</td>
<td>Fewer</td>
</tr>
<tr>
<td>Post-ictal confusion</td>
<td>Very long</td>
<td>Brief</td>
</tr>
</tbody>
</table>

**Source:** Adapted from Collins et al (2006)

**Clinical presentation**

Seizures often present differently in older adults (Table 1), mainly due to age-related changes in the brain (LaRoche and Helmers, 2003). The presentation of epilepsy in these patients can therefore be subtle and is often missed. The clinical presentation of a tonic-clonic state, presenting as dramatic convulsions, only occurs in 25% of older people with epilepsy; more often the presentation is mild and unlike that seen in young people. Older patients may present with any of the following:

- “Strange” feelings;
- Subtle behavioural changes;
- Staring;
- Memory blanks;
- An unaccountable loss of time;
- Transient confusion.

Auras (symptoms preceding the seizure) are commonly seen in young patients but less so in older people. The recovery phase (post-ictal period) is significantly longer in older people, sometimes lasting up to two weeks rather than minutes or a few hours for younger people. There is also an increased incidence of Todd’s paresis after seizures. This focal weakness is localised to the left or right side of the body and usually subsides completely after 48 hours; it may also affect speech, gaze or vision. Automatisms (repetitive behaviours) are also more frequent in older people than younger people. The seizure may have been witnessed by a partner or relative who may report a history of pallor, abnormal movements, tongue biting, urinary incontinence, headache, confusion or drowsiness.

The subtlety and vagueness of symptoms can make diagnosis difficult and lead to delay. Epilepsy among older adults is often mistaken for other conditions such as dementia, stroke, heart disease and transient amnesia, so goes unrecognised in people who already have these conditions, or is dismissed as part of the ageing process (Aldrich, 2006).

**Diagnosis**

A key barrier to diagnosing epilepsy in older adults is the failure of some physicians to recognise the symptoms of epilepsy in older patients. Furthermore, a high proportion of patients experience complex partial seizures with symptoms such as wandering, listlessness or confusion (not knowing who or where they are), which make diagnosis difficult. One study showed patients waited an average of 1.8 years to be diagnosed (Johnston and Smith, 2007).

Diagnosis is based on a careful history and clinical examination. The history should include a full list of medications, and a detailed past medical history, in particular cerebrovascular risk factors and a history of the event(s). Witness reports of twitching, involuntary movements, loss or disturbance of consciousness, confusion, behavioural changes or absence attacks can be invaluable and should be sought where possible. Epilepsy is a probable diagnosis if:

- Events occur with the patient in a variety of postures, rather than always in the upright position or on standing from supine position;
- Events always occur during sleep;
- Confusion or amnesia following an event lasts for more than an hour;
- The patient experiences myalgia (muscle pain), headache or bitten lateral tongue or cheek.

Finally, abrupt and transient confusion, especially when recurrent, should always prompt consideration of epilepsy (Tallis, 1995). Asking patients to keep a diary of the events, with dates, times and a description of what happened and how they felt before and after, can also be useful when making a diagnosis.

Diagnosis of epilepsy is clinical but investigations are helpful when diagnosis is uncertain, or when other conditions cannot be excluded. Investigations depend on the patient’s presentation but may include:

- Electrocardiograph (ECG);
- Ambulatory ECG.
The following: et al, 1998; Smith et al, 1999). The list of dif-
adults with underlying epilepsy (Scheepers
and possibly affects up to 30% of older
seizures. Misdiagnosis is common
older people’s care, neurologists, and car -
common complaints in older people and,
Falls, faints and “funny turns” are all
responses to tilt-table testing and carotid
magnetic arrhythmias on ECG and positive
fections; infections;
Endocrine/metabolic: renal failure, hypo-
hyperglycaemia, electrolyte distur-
ances (hyponatraemia, hypokalaemia, hypocalcaemia);
Sleep disorders: obstructive sleep
apnoea;
Alcohol withdrawal;
Drug-induced seizures: antihistamines,
antidepressants, antipsychotics and
hypoglycaemic drugs.
Syncope is more prevalent than epi-
lepsy in older people and should always be
considered, especially if there is a postural
component, for example if symptoms
occur on rising or standing, or if the
patient is taking any medications known
to cause postural hypotension (such as
antidepressants, antihypertensives, antip-
sychotics or diuretics). Epilepsy may be
misdiagnosed as syncope and vice versa
(Josephson et al, 2007; Grubb, 2005; Zaidi
et al, 2000). Table 2 shows a comparison
between seizures and syncope.
Differential diagnosis
Falls, faints and “funny turns” are all
common complaints in older people and,
in some patients, will be caused by epi-
lepsy. The variation in presentation means
these patients may be seen by a range of
clinicians, including GPs, specialists in
older people’s care, neurologists, and car-
diologists.
A range of conditions can mimic epi-
leptic seizures. Misdiagnosis is common
and possibly affects up to 30% of older
adults with underlying epilepsy (Scheepers
et al, 1998; Smith et al, 1999). The list of dif-
f erential diagnoses can be grouped into
the following:
Neurological: transient ischaemic
attack, transient global amnesia,
migraine, narcolepsy, restless leg
syndrome;
Cardiovascular: vasovagal syncope,
orthostatic hypotension, cardiac
arrhythmias, structural heart disease,
carotid sinus syndrome;
Infections;
Endocrine/metabolic: renal failure, hypo-
thyroidism, hypoglycaemia, hyperglycaemia,
electrolyte distur-
bances (hyponatraemia, hypokalaemia,
hypocalcaemia);
Sleep disorders: obstructive sleep
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Treatment
Drug treatment is the mainstay of therapy
in epilepsy. However, prescribing anti-
epileptic drugs (AEDs) in older people is
more complex than it is in younger people,
who are often in better health and less likely
to be taking other medications (Ramsay
et al, 2004). Older adults often have comor-
bidities as well as functional and cognitive
impairment. Additionally, age-related
physiological changes can affect the phar-
macokinetics and pharmacodynamics of
AEDs, while polypharmacy is common in
older people and some of their other drugs
may make seizures more likely or AEDs less
effective. It is therefore particularly impor-
tant to treat newly diagnosed older patients
with a single AED initially, as recom-
mended by the National Institute for
Health and Clinical Excellence (2012).
AEDs work by reducing the excessive
electrical activity or excitability of the
neurons in the brain. They are divided into
first-line and second-line drugs; first-line
AEDs are usually prescribed when treat-
ment is started. If the prescribed first-line
drug does not control the seizures or is not
tolerated because of side-effects, a dif-
ferent first-line drug may be tried, or a
second-line drug may be prescribed along-
side the first. A “start low and go slow”
approach should be used, with the aim of
controlling seizures using the minimum
and lowest dose of AEDs, while causing the
fewest side-effects.
Epilepsy in older people generally
responds well to treatment. Around
60-70% will achieve seizure control with a
single AED, and up to 80% can be expected
to remain seizure free with AED treatment
(Brodie and Kwan, 2005). However, older
people are more susceptible to the adverse
effects of AEDs than their younger coun-
terparts; the drugs need to be taken con-
sistently (every day at the same time) to
prevent seizures and this can be chal-
 lenging for some older adults, who may be
more likely to forget to take their medica-
tion. It is not clear whether treatment can
be safely withdrawn after a seizure-free
period, so most patients who are very old
will remain on their AEDs for life.
The goal of management should be a
normal lifestyle – ideally through com-
plete control of seizures without (or with
minimal) side-effects – so that the patient’s
functional capacity is restored. Among the
most common side-effects of AEDs that
affect people in later life are unsteadiness
and sleepiness. Some AEDs can increase
the risk of osteoporosis and osteomalacia
(Lidgren and Walloe, 1977); it is not clear
whether this extends to the newer AEDs
and more long-term studies are needed.
Depression can be a side-effect of AEDs,
particularly the older drugs such as pheno-
toin, phenobarbital and primidone. AEDs
can also exacerbate memory problems,
intensifying a decrease in cognitive func-
tion associated with the ageing process.
Recent reviews such as that by Johnston
and Smith (2007) have indicated that the
newer AEDs such as lamotrigine, levetira-
tam and gabapentin are better tolerated
and produce fewer side-effects than the
long-established drugs such as car-
bamazepine, phenytoin and sodium val-
proate; the newer drugs are therefore rec-
ommended for the treatment of epilepsy in
older adults.
Quality-of-life
Although few studies have investigated
the lifestyle implications of epilepsy in
older people, the data indicates that the

| TABLE 2. SEIZURES AND SYNOCOPE |
|-----------------------------|------------------|
| Seizures                    | Syncope          |
| Posture                    | Onset            |
| Not position dependent     | Gradual          |
| Common                      | More common      |
| Typically in upright       | Sudden           |
| Less common                 | Recovery         |
| Marked                      | Slow             |
| Little                      | Post-confusion   |

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adverse consequences are at least as important in this age group as for younger people (Baker et al., 2001). These harmful consequences, which may be immediate or take longer to manifest, include:
- Loss of independence;
- Loss of confidence;
- Social isolation;
- Embarrassment;
- Low self-esteem;
- Anxiety;
- Depression;
- Driving restrictions; and
- Difficulties with employment.
All these have all been suggested as important contributors to impaired quality of life (Baker et al., 2001). In later life the effect on occupation may be less important but the social and functional effects of a diagnosis of epilepsy are diverse.

Seizures resulting in falls, confusion or amnesia might erode confidence and contribute to social isolation. Patients can become frightened to leave the house alone or be embarrassed about an event happening in the presence of others. Many older people associate epilepsy with negative images of intellectual disability and poor seizure control, and may be reluctant to share the problem with friends or accept the diagnosis of epilepsy.

Driving restrictions might limit independence and provoke further isolation for those already living alone. There is also data suggesting older people with epilepsy have a decreased mental status and a higher prevalence of depression, anxiety and poor sleep compared with peers of a similar age who do not have epilepsy (Brodie et al., 2009). All these factors translate into a poorer quality of life. It has been suggested that the occurrence of seizures may represent a “significant watershed in an older person’s life after which there is a prolonged post-ictal phase to cause injury in older people. Further-

The nursing role
Nurses – and epilepsy specialist nurses in particular – can play a valuable role in managing epilepsy in older people. As the professionals who spend the greatest amount of time with patients and their carers, they may be best placed to gain vital information about the circumstances around the event, which is important in establishing (or excluding) a diagnosis of epilepsy.

Nurses also play a role in offering reassurance, information and support to patients and their families following the diagnosis, giving advice on all aspects of the condition, including its management, treatment and lifestyle implications. They can encourage and support patients to live as full lives as possible by discussing concerns an epilepsy diagnosis may raise, including driving, working, safety and leisure issues. Epilepsy specialist nurses also have a role in the follow-up of patients and monitoring their response to treatment – a role which has proved valuable (Risdale et al., 1999).

Conclusion
Epilepsy is a common and increasing problem in an ageing population. It can be difficult to diagnose but can be treated effectively. Treatment can be complicated by underlying comorbidities, polypharmacy and concomitant functional impairment. AEDs provide good control, which is frequently achieved by monotherapy, but should be introduced at a low dose and stepped up slowly. If left untreated epilepsy can lead to loss of independence (including nursing home placement), social isolation and depression.

References

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“Measure your team’s performance to improve patient care”
Paul Jebb p33

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