Emergency medication in the community
Jennifer Nightingale, Epilepsy specialist nurse

Epilepsy is defined by repeated unprovoked seizures. Seizures are typically brief stereotyped events that cause both psychic and physical manifestations. The underlying causes of epilepsy are multiple, ranging from traumatic brain injury to genetic. Although most seizures are brief, self-terminating events usually lasting no longer than 2-3 minutes, a minority of patients can experience prolonged seizures.

Status Epilepticus

Prolonged seizures can become a medical emergency and lead to status epilepticus (or 'status' for short). Status can be defined as a prolonged seizure, or repeated seizures with no full recovery, lasting 30 minutes or longer. **In practice any generalized tonic-clonic seizure lasting longer than 5 minutes should be treated as a medical emergency.**

Status can be divided into two groups:
- convulsive status - occurs during tonic clonic seizures; and
- non-convulsive status – covers a broad group such as absence status, myoclonic, tonic and complex partial status

Management of convulsive status

This review concentrates on the management of prolonged generalized tonic clonic seizures, which can lead to generalised tonic clonic or convulsive status.

Generally, most people with epilepsy do not usually experience prolonged seizures, and they are more common in children, the elderly, those with a frontal pathological cause for their epilepsy and people with a learning disability.

The incidence of status is between 10-20 per 100,000 with a mortality rate of 10-20%. The mortality rate is highly dependent on the underlying cause of the status. In some studies mortality rate is cited as high 48% in those with a diagnosis of refractory epilepsy.

There is evidence to suggest that once a person has experienced one episode of status it is likely to recur in over 10% of people. Status is commonly precipitated by concurrent illness such as infection, or by drug withdrawal. Approximately 15-20% of people with epilepsy have at least one episode of status.

**The potential impact of convulsive status**

The risk of death or long term cognitive difficulties is a very real issue for people who experience convulsive status. One of the major challenges for careers and health professionals is to manage prolonged seizures at home and prevent the development of status. The longer the seizures continue uninterrupted the great the risk of morbidity or mortality, thus the emphasis on treating the seizures rapidly.
“As GCSE [generalised convulsive status epilepticus] evolves, major systemic derangements occur, including hypoglycemia, hyperthermia, hypoxia, and acidosis that exacerbate neuronal injury. These changes may predispose to cardiac arrhythmias, pulmonary edema, aspiration, respiratory failure, or renal failure, and ultimately cardiovascular collapse, especially in conjunction with drug treatment”

(Tatum et al 2001).

Although all patients with a diagnosis of epilepsy are potentially at risk of status, those with well-controlled or infrequent seizures are highly unlikely to experience an episode of status.

**Care plans**

Individuals with a history of prolonged seizures should have a review with their specialist and discussion about the management of prolonged seizures at home. A care plan should be compiled with input from Neurologist, GP, Community nurses and careers.

In order to provide a comprehensive care plan it is essential to have a good understanding of your patient’s epilepsy. You should identify:

- their seizure type or types (including a detailed description of each seizure type);
- their habitual seizure duration;
- their syndrome diagnosis where possible; and
- whether they have a history of prolonged seizures or episodes of status.

(See Joint Epilepsy Councils care plan for rectal diazepam and buccal midazolam www.jointepilepsycouncil.org.uk)

**The goals of managing seizures and status**

The goal is to prevent status and minimise any risk to patients by stopping prolonged seizures as soon as possible in their home environment. Educating and supporting family members and carers is essential, and working together to develop an appropriate care plan to manage these seizures is paramount.

If seizures last longer than 5 minutes this should be treated as a medical emergency (some people will experience habitual seizures that last longer than 5 minutes and are self-terminating but the vast majority of seizures are within 2-3 minutes)

Basic first aid should be provided which involves:

- staying with the person;
- removing any dangerous objects from area around the person, or moving the person if they are in danger of hurting themselves;
- placing a pillow or something soft under the persons head to protect it;
- turning the person onto their side in the recovery position when able; and
- timing the seizure to ensure that help is called if the seizure is longer than normal or appears to not be self-terminating.
Emergency medication

Emergency medication to stop status developing can be administered in the community. The two main drugs available are rectal diazepam and buccal midazolam. They are similar in their ability to abort seizures.

Rectal diazepam

- Licensed for use in prolonged seizures (30 years experience).
- Given rectally via a disposable rectal tube. (5 or 10mg tubes).
- Diazepam has a long elimination half-life of 30 hours but it can rapidly redistribute to fat and muscle, dramatically affecting its redistribution half-life resulting in dramatic drops in plasma levels. In practice this may mean the re-emergence of seizures can occur within 30min - 2 hours.
- There are issues around dignity consideration and practicality (for example, with an individual in a wheelchair).
- Side effects include sedation, hypotension and respiratory depression, and bowel perforation.
- Training is essential before someone administers rectal diazepam.

Buccal midazolam

- Unlicensed in adults (no randomized trials in adults).
- 75% chance of stopping seizure.
- Studies in children show it is as effective as diazepam.
- It has an easier administration route than diazepam.
- It can be used in public without the individual's dignity being affected.
- There is no difference in the risk of adverse effects according to studies performed in children. Side effects include sedation and hypotension.
- Training is essential before someone administers buccal midazolam.
- There are some prescribing barriers (see below)

Specific issues with buccal midazolam

The updated NICE guidelines (2012) confirm the use of buccal midazolam as a first line treatment for prolonged seizures. It is licensed in children and young people but yet to be licensed in adults. It is widely used but the following should be taken into consideration.

- Midazolam is unlicensed for use in adults with status.
- Any medicine intended for human use within the UK requires ‘marketing authorization’ undertaken by The Medicines and Healthcare Regulatory Agency (MHRA). This government organisation adheres to the medicines licensing act 1968.
- Prescribing unlicensed medicines or licensed medicines for unlicensed uses alters the doctors professional liability. The prescribing Doctor needs to justify their actions and:
  - be aware it is unlicensed medication (for adults);
  - be aware of the side effects of the medication;
  - be aware of potential drug interactions;
  - be familiar with the drug or act directly on the advise of a colleague or professional body;
  - to clearly document information around the prescribing and use of the medication; and
  - ideally use a shared care plan/protocol between the GP and consultant.
It is essential that all users and carers understand that buccal midazolam is unlicensed for use in adults. They must also be made aware of the risks and benefits of the drug. Carers and users must also consent to its use. If the patient does not have capacity to give informed consent, provisions under the mental health act will apply. A shared care plan should be agreed with Neurologist, GP, Community nurses, user and carers. This care plan should be discussed with any daycare or respite services that the user engages with.

Emergency medication training
The practicalities of administering buccal midazolam and rectal diazepam are relatively straightforward. Training for administration can be given by qualified staff.

In current practice, buccal midazolam is becoming a more popular option than rectal diazepam due to the ease of use and maintaining a patient's dignity Training for carers can be provided by neurologists, epilepsy specialist nurses, GP’s and community nurses. Training for respite service, daycare and paid carers requires formal certified training. This can be provided by:
- charitable organisations such as Epilepsy Society;
- medical and nursing private organisations; and
- in-house training by care providers.

Hospital Admission
In certain cases hospital admission is unavoidable. Providing a clear care plan will allow carers to ensure that they know when to call emergency services. Admission to hospital will be needed in the following circumstances:
- if a seizure does not respond to rescue medication;
- if any breathing difficulties, or obstruction of airway occurs;
- if there is any head trauma;
- if an individual experiences serial seizures suggesting risk of status; and
- if there is any post ictal (after seizure) behavior which causes concern. For example, post ictal psychosis (which should not be confused with the typical confusion or fatigue that follows seizures).

The psychological burden of prolonged seizures and status
The experience of prolonged seizures and status is often very frightening for patients and carers. A thorough care plan should support and reassure the patient and their carers. However, the psychological impact of witnessing these life-threatening events should not be underestimated. Patients and carers should be able to discuss in detail with their specialist how to manage prolonged seizures, agree a care plan, and have access to ongoing support (ideally telephone and face-to-face access) to an epilepsy specialist nurse.

These notes are taken from Jennifer’s presentation at Epilepsy Society and LSBUs conference 'managing epilepsy: improving outcomes', held on 5 July 2013.