Management of spasticity is complex and requires input from a multidisciplinary team.

Consideration should be given to:

1. Prevention of provocative factors: including pain, constipation, infection and poor postural management.
2. Physical therapy: to maintain muscle and soft tissue strength, improve body symmetry and facilitate functional activity following upper motor neurone damage.
3. Medical treatment: depending on whether the spasticity is general, focal or regional. Focal spasticity may respond to oral agents such as baclofen (see above), intramuscular Botox, intrathecal agents such as baclofen, or surgical intervention.

Use of Botox (see above) should be decided using selection criteria that answer the following questions:

1. is the problem amenable to this treatment?
2. is there a significant component of muscle overactivity?
3. is this focal and which muscles are involved?
4. what is the aim of the treatment?
5. how will treatment improve the patient's situation?
6. are there any contraindications?
7. how will outcomes be evaluated?

In chronic spasticity, the focus of management may well be on symptomatic improvement (e.g. pain relief, better functional capacity), prevention of complications (e.g. contractures, immobility osteoporosis) as well as easing the carer burden.

The primary aim of treatment is to maintain length in spastic muscles and allow normal positioning of the limbs in order to prevent secondary soft tissue change.
60% of patients with moderate to severe Multiple Sclerosis require specific spasticity treatment. ([1])

Snow et al. ([2]) and Hyman et al. ([3]) have performed controlled trials of Botox in spasticity in patients with MS. Barnes et al. ([4]) recently published a paper on Spasticity in MS. They found a 47% incidence of spasticity within their study population of MS patients.

The authors noted

"Individuals with spasticity were found to have significantly higher levels of disability than those who had no spasticity or clinically insignificant spasticity."

They recommend strategies such as:

- attention to underlying exacerbating factors
- physiotherapy for gait training, positioning and seating
- use of oral medication such as baclofen (see above)
- use of focal injection techniques e.g. botulinum
- intrathecal baclofen in severe cases
- surgical measures

In their study population, they found that baclofen was used in 23 people (34%), but in 9 cases, suboptimally. Dantrolene sodium was only used in 7 people (10%) of which 3 required further treatment adjustment. Diazepam was only used in 4 people (6%).

Tizanidine had only just been introduced onto the UK market at the time of the study (1998/9) so was not being used, although the authors commented that a number of cases that were unresponsive to baclofen (developed tolerance) may well have been good candidates for the use of tizanidine.

6% of the study were given regular botulinum toxin injections.
68% were receiving active and ongoing physiotherapy, and a further 25% might well have benefited from this had they been referred.

Barnes et al. concluded:

"A significant proportion of the population seemed to be inadequately treated with regard to oral medication."

Botulinum toxin has also been used in children with cerebral palsy.

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[1] Barnes et al. The Management of Adults with Spasticity using Botulinum Toxin: A Guide to Clinical Practice April 20017744

[2] Snow BJ, Tsui JKC, Bhatt MH et al. *Annals of Neurology* 1990; 28(4): 512-515 Treatment of spasticity with botulinum toxin: a double blind study

[3] Hyman N, Barnes M, Bhakta B et al., *Journal of Neurology, Neurosurgery and Psychiatry* 2000; 68: 707-12 Botulinum toxin (Dysport) treatment of hip adductor spasticity in multiple sclerosis: a prospective, randomised, double-blind, placebo-controlled, dose ranging study.

[4] Barnes MP, Kent RM, Semlyen JK, McMullen KM. *Neurorehabil Neural Repair* 2003 Mar;17(1):66-70 Spasticity in multiple sclerosis.