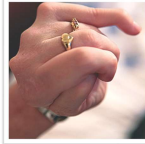


AN UPDATE ON SPASTICITY MANAGEMENT

Management of Spasticity



Spasticity Health-care Team

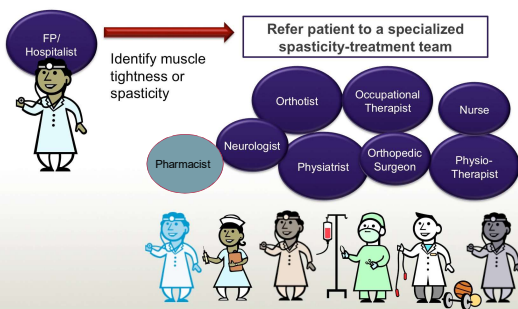


Table 1. Summary of criteria for levels of evidence reported in the Canadian stroke best practice recommendations (update 2015).¹³

Level of evidence	Criteria
A	Evidence from a meta-analysis of randomized controlled trials or consistent findings from two or more randomized controlled trials. Desirable effects clearly outweigh undesirable effects or undesirable effects clearly outweigh desirable effects.
B	Evidence from a single randomized controlled trial or consistent findings from two or more well-designed non-randomized and/or non-controlled trials, and large observational studies. Desirable effects outweigh or are closely balanced with undesirable effects or undesirable effects outweigh or are closely balanced with desirable effects.
C	Writing group consensus and/or supported by limited research evidence. Desirable effects outweigh or are closely balanced with undesirable effects or undesirable effects outweigh or are closely balanced with desirable effects, as determined by writing group consensus. Recommendations assigned a Level-C evidence may be key system drivers supporting other recommendations, and some may be expert opinion based on common, new or emerging evidence or practice patterns.

Note: For a more detailed description of the methodology on the development and dissemination of the CSBPR please refer to the Canadian Stroke Best Practice Recommendations Overview and Methodology documentation available on the Canadian stroke best practices website at www.strokebestpractices.ca.

AN UPDATE ON SPASTICITY MANAGEMENT

UPPER EXTREMITY SPASTICITY

Recommendations

- i. Spasticity and contractures may be prevented or treated by antispastic pattern positioning, range-of-motion exercises, and/or stretching (Evidence Levels: Early-Level C; Late-Level C).
- a. Routine use of splints is not recommended in the literature (Evidence Levels: Early-Level A; Late-Level B); however, optimal protocols for utilizing splinting for improvement or preservation of tissue length and spasticity management have not yet been determined.
- b. In some select patients, the use of splints may be useful and should be considered on an individualized basis (Evidence Level C). A plan for monitoring the splint for effectiveness should be provided (Evidence Level C).
- ii. Chemodenervation using botulinum toxin can be used to increase range of motion and decrease pain for patients with focal and/or symptomatically distressing spasticity (Evidence Levels: Early-Level C; Late-Level A).

UPPER EXTREMITY CONTINUED

- ii. Oral medications can be prescribed for the treatment of disabling spasticity:
 - a. Tizanidine can be used to treat more generalized, disabling spasticity. (Evidence Levels: Early-Level C; Late-Level B).

- b. Baclofen can be used as a lower cost alternative but has not been studied in this population (Evidence Levels: Early-Level C; Late-Level C). *Note: Baclofen initial dosing should be low and titrated upwards slowly as tolerated by patients.*
- c. Benzodiazepines should be avoided due to sedating side effects, which may impair recovery (Evidence Level: Early-Level C; Late-Level C).
- iv. The presence of spasticity should not limit the use of strength training in the arm (Evidence Level: Early-Level C; Late-Level C).

- Management of Hemiplegic Shoulder Pain**
- i. Treatment of hemiplegic shoulder pain related to limitations in range of motion includes **gentle** stretching and mobilization techniques, and typically involves increasing external rotation and abduction. (Evidence Level B).
 - a. Active range of motion should be increased gradually in conjunction with restoring alignment and strengthening weak muscles in the shoulder girdle (Evidence Level B).
 - ii. If there are no contraindications, analgesics (such as acetaminophen or ibuprofen) can be used for pain relief (Evidence Level C).
 - iii. Injections of botulinum toxin into the subscapularis and pectoralis muscles could be used to treat hemiplegic shoulder pain thought to be related to **spasticity** (Evidence Level B).
 - iv. Subacromial corticosteroid injections can be used in patients when pain is thought to be related to injury or inflammation of the subacromial region (rotator cuff or bursa) in the hemiplegic shoulder (Evidence level B).

SPASTICITY AND PAIN

AN UPDATE ON SPASTICITY MANAGEMENT

LOWER EXTREMITY SPASTICITY

Recommendations

- i. Antispastic pattern positioning, range-of-motion exercises and/or stretching may be considered for prevention or treatment of spasticity and contractures (Evidence Level: Early-Level C; Late-Level B).
- ii. Ankle splints used at night and during assisted standing may be considered for prevention of ankle contracture in the hemiparetic lower extremity (Evidence Level C).

- iii. Chemodenervation using botulinum toxin can be used to reduce spasticity, increase range of motion, and improve gait, for patients with focal and/or symptomatically distressing spasticity (Evidence Level: Early-Level C; Late-Level A).
- iv. Oral medications can be prescribed for the treatment of disabling spasticity:
 - i. Tizanidine can be used to treat more generalized, disabling spasticity. (Evidence Levels: Early-Level C; Late-Level B).
 - ii. Baclofen can be used as a lower cost alternative to treat more generalized disabling spasticity (Evidence Levels: Early-Level C; Late-Level C).
 - iii. Benzodiazepines should be avoided due to sedating side effects, which may impair recovery (Evidence Level: Early-Level C; Late-Level C).
- v. The presence of spasticity should not limit the use of strength training in the leg (Evidence Level: Early-Level C; Late-Level C).
- vi. Intrathecal Baclofen should be considered for specific cases of severe, intractable and disabling/painful spasticity (Evidence Level: Late-Level B).

EVIDENCE BASED STROKE REVIEW WWW.EBSR.COM



AN UPDATE ON SPASTICITY MANAGEMENT

Table 2. Modified Sackett Scale Version 4.0.

Level	Research Design	Description
Level 1a	Randomized Controlled Trial (RCT)	More than 1 Higher RCT: Randomized Controlled Trial, PEDro score ≥ 6 . Includes within subjects comparison with randomized conditions and cross-over designs.
Level 1b	RCT	1 Higher Randomized Controlled Trial, PEDro score ≥ 6 .
Level 2	RCT	Lower RCT, PEDro score < 6 .
	Prospective Controlled Trial (PCT)	Prospective Controlled Trial (not randomized).
	Cohort	Prospective Longitudinal study using at least 2 similar groups with one exposed to a particular condition.
Level 3	Case Control	A retrospective study comparing conditions, including historical cohorts.
Level 4	Pre-Post	A prospective trial with a baseline measure, intervention, and a post-test using a single group of subjects.
	Post-test	A prospective post-test with two or more groups (intervention followed by post-test and no re-test or baseline measurement) using a single group of subjects.
	Case Series	A retrospective study usually collecting variables from a chart review.

STRETCHING AND SPLINTING



STRETCHING

Conclusions Regarding Stretching Programs to Prevent Contracture Formation

There is level 1b evidence that a nurse-led stretching program may improve range of motion in the upper extremity and reduce pain in the chronic stage of stroke.

There is level 1b evidence that a hand stretching device may improve spasticity in the upper limb.

There is level 2 evidence that supplementing stretching programs with joint stabilization exercises may improve muscle thickness in the affected arm as well as arm function; however, no such effect is found when the stretching programs are delivered alone.

Further research is needed to determine a stretching program that may improve upper limb spasticity.

AN UPDATE ON SPASTICITY MANAGEMENT

SPLINTING

Conclusions Regarding the Use of Splints to Prevent Ankle Contracture

There is level 1b evidence that both a tilt table and night splint may prevent ankle contracture in the early period following stroke.

Splints and tilt tables are both effective in the prevention of ankle contracture.

Conclusions Regarding Splinting

There is level 1a and level 2 evidence that splinting does not reduce the development of contracture nor reduce spasticity in the upper extremity; however, it may improve passive range of motion.

Hand splints alone do not reduce spasticity or prevent contracture.

PHYSICAL THERAPY



PHYSICAL THERAPY

Conclusions Regarding Physical Therapy to Reduce Spasticity

There is level 1b evidence that rehabilitation programs compared to standard medications may improve spasticity for the elbows, fingers and plantar flexion.

There is level 1a evidence that ankle exercises compared to conventional therapy may not improve gait, ankle range of motion or spasticity but may improve balance.

There is level 3 evidence that robotic training may not improve spasticity, gait, or spasticity.

There is level 1b evidence that a single session of isokinetic or isotonic muscle stretch may not improve measures of gait.

Evidence is inconclusive for the effect of rehabilitation programs, ankle exercises, robotic training and other physical therapies on spasticity post-stroke.

Conclusions Regarding Physical Therapy

There is level 1a and limited level 2 evidence that physical therapy may not improve motor function or contracture.

Physical therapy may not decrease spasticity, or pain, or contracture, or improve upper extremity motor function.

AN UPDATE ON SPASTICITY MANAGEMENT

SHOCKWAVE THERAPY



SHOCKWAVE THERAPY

10.5.8 Shock Wave Treatment

Shock wave therapy has been demonstrated to effectively treat a variety of bone and tendon diseases by reducing hypertonia and may be an attractive treatment option for stroke patients compared to botulinum toxin.

The results of one RCT evaluating shock wave therapy are summarized in Table 10.5.8.1.

Table 10.5.8.1 Summary of RCT(s) Evaluating Shockwave Therapy in the Upper Extremity

Author, Year Study Design (PEDro Score) Sample Size	Intervention	Main Outcome(s) Result
Sabatamato et al. (2013) Italy RCT (8) N=16	E. Botox + extracorporeal shockwave therapy C. Botox + electrical stimulation therapy	• Modified Ashworth Scale (MAS) (+) • Spasm Frequency Scale (+) • Visual Analogue Scale (+)
