

TOXNET CURRICULUM FOR ASSESSMENT AND MANAGEMENT OF SPASTICITY

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Rationale

- Spasticity is a common complication of neurologic conditions
- In adults, it can be observed in patients with the following conditions: stroke; spinal cord disease and injury; acquired brain injuries; cerebral palsy
- It is the impression of spasticity experts that spasticity education is lacking in some parts of the world and that there is lack of uniformity in terms of the breadth and depth of spasticity training

Background

- ToxNet is an international group of physicians, expert in spasticity management that aims to improve education and provide guidance to deliver equitable and optimal spasticity management worldwide
- A recent needs assessment survey of 55 international spasticity experts assessed the adequacy of physician training in their local residency programs across 25 spasticity topics
- The topics perceived as areas relatively deficient in physician training:
 - identification of candidates for dorsal rhizotomy;
 - identification of candidates for functional neurotomy;
 - performance of diagnostic nerve block using lidocaine;
 - performance of phenol or alcohol nerve block;
 - performance of intrathecal baclofen pump refills;
 - troubleshooting of intrathecal baclofen therapy-related problems.

Also included were topics in which trainees receive relatively adequate training:

- recognition of signs of upper motor neuron syndrome other than spasticity;
- obtaining clinical history and medical information specific to spasticity;
- performance assessment using Ashworth or modified Ashworth Scale; and
- performance of botulinum toxin chemodenervation (see Table 1)

Table 1: Spasticity education topics assessed in the survey.	
Topic assessed	Assessment of training*
Identifying candidates for dorsal rhizotomy	1.35
Identifying candidates for functional neurotomy	1.53
Performance of diagnostic nerve block using lidocaine	1.65
Performance of phenol or alcohol nerve block	1.73
Troubleshooting intrathecal baclofen therapy-related problems	1.83
Performing intrathecal baclofen pump refills	1.93
Performance of Tardieu assessment method	2.23
Identifying candidates for tendon lengthening	2.28
Use of EMG for injection guidance	2.38
Identifying candidates for intrathecal baclofen therapy	2.4
Troubleshooting suboptimal outcomes of botulinum toxin chemodenervation or neurolysis	2.43
Goniometric measurement of spastic limbs	2.58
Use of ultrasonography for injection guidance	2.6
Use of electrical stimulation for injection guidance	2.63
Ordering of diagnostic tests, if indicated	2.68
Understanding the role of adjunctive physical modalities (therapies, taping, casting, electrical stimulation, etc.)	2.75
Treatment Goal Setting	2.8
Knowledge of pathophysiology of spasticity and upper motor neuron syndrome	2.85
Prescription of oral spasmolytics to appropriate patients	2.94
Clinical assessment of impact of spasticity on function and quality of life	2.98
Knowledge of clinical presentation of various spastic postures and muscles	2.98
Performance of botulinum toxin chemodenervation	3.03
Performance on Ashworth or modified Ashworth scale	3.03
Obtaining clinical history and medical information specific to spasticity	3.03
Recognition of signs of upper motor neuron syndrome other than spasticity	3.05
* 0=nonexistent; 1=present but very deficient; 2=needs improvement/refinement; 3=adequate; 4=more than adequate;	
Convenience sample: Spasticity experts, educators, ISPRM Education committee, World Federation of Neurorehabilitation SJG chairs. Invited: 55 individuals, 25 countries (no known contacts in some regions). Responded: 41 individuals, 19 countries.	

Objective

- To develop a global spasticity curriculum that addresses key unmet needs, identified by the survey, for spasticity training in physical medicine, rehabilitation, and neurology residency programs
- The ToxNet group will be publishing slides and manuscripts to share with the wider community with the aim of international adoption of the materials for use in future academic and commercial training courses

Methods

- Members of the ToxNet group worked in small groups to research and develop content under 3 broad headings:
 - Pathophysiology
 - Assessment
 - Management (examples of work shown in Figure 1-3)

Figure 1. Management (development of an individual strategy)

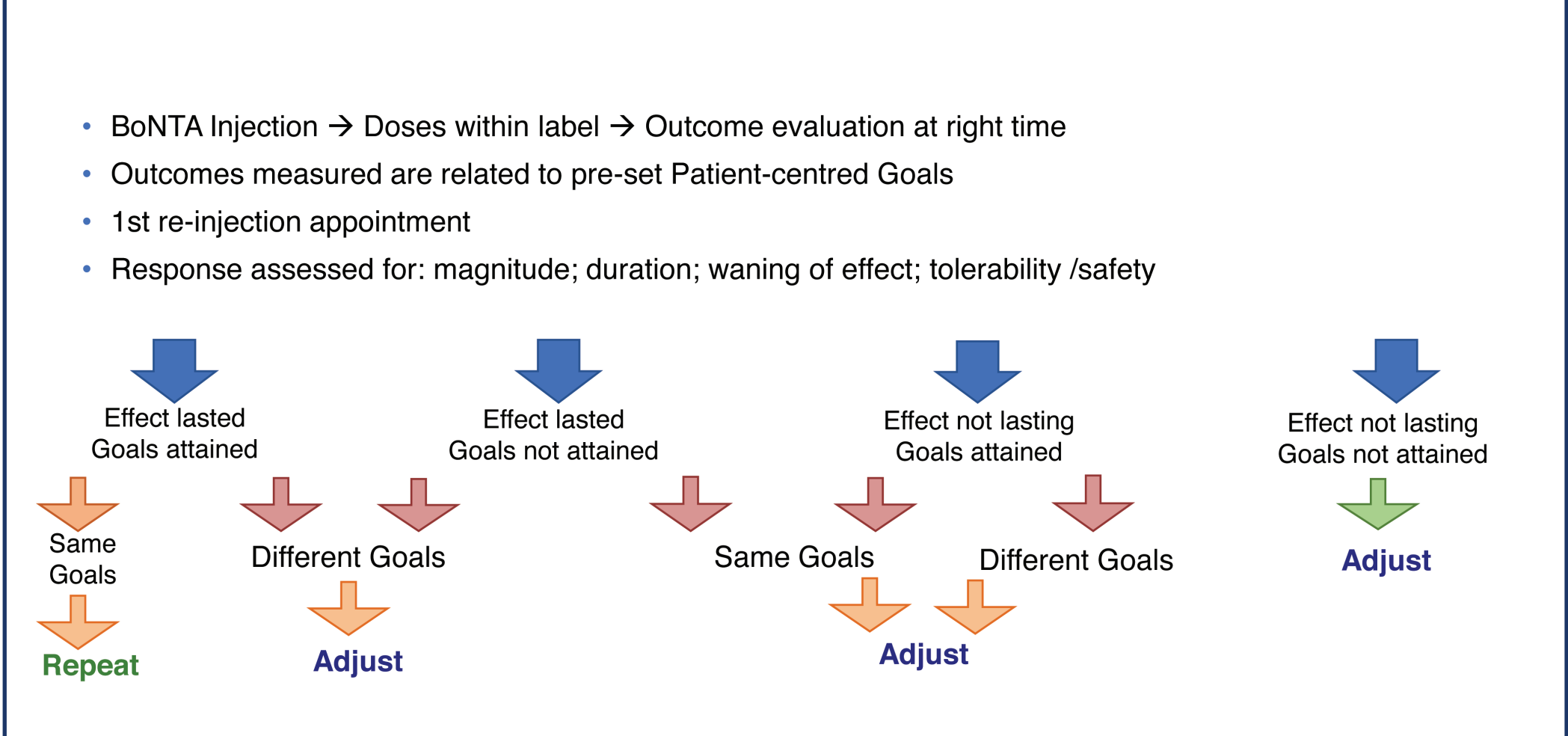
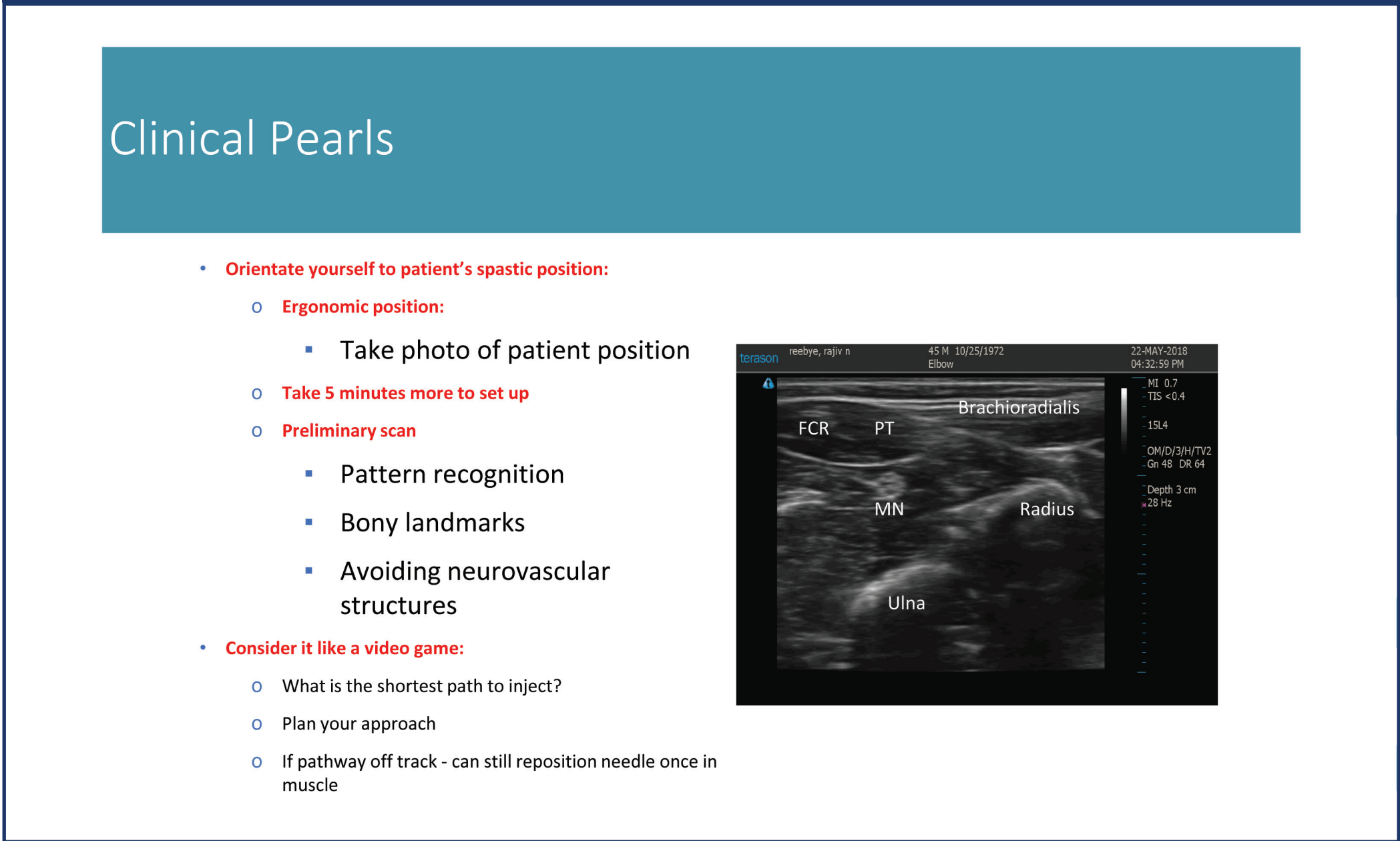


Figure 2. Management (types of focal spasticity patterns for serial casting)



Figure 3. Management (targeting techniques)



- These were further broken down into chapters with learning objectives as detailed in Table 2.
- The groups performed literature searches on the topics and distilled the best available evidence into a slide deck addressing the learning objectives for each chapter
- The slides were reviewed by the whole group and then a meeting was convened to further interrogate and challenge the content
- The slides were further refined and finalized; these will be made available on the ToxNet website in due course
- The group is currently developing manuscripts, based on the content that will be submitted to a peer-reviewed journal for publication

Table 2: Curriculum content chapters and learning objectives	
Chapter	Learning objectives
PATHOPHYSIOLOGY	A1. Explain the pathophysiology of spasticity based on disease, condition and location of the lesion A2. Compare and contrast the positive and negative signs and symptoms of the upper motor neuron syndrome A3. Predict occurrence of spasticity within the first few months after injury or disease onset
ASSESSMENT	B1. List important historical and medical information specific to spasticity across diagnoses B2. Explain differences in clinical presentations of spasticity of cerebral vs. spinal origin B3. Describe different clinical presentations and various limb spastic postures B4. Enumerate muscles involved in various limb spastic postures B5. Describe the impact of spasticity on function and quality of life B6. Perform Ashworth or modified Ashworth scale B7. Perform Tardieu assessment measure B8. Perform goniometric measurement of spastic limbs B9a. Describe the role of diagnostic nerve block in assessing spasticity versus contracture B9b. Perform diagnostic nerve block
MANAGEMENT	C1a. Explain the importance of treatment goal setting C1b. Perform Goal Attainment Scaling C2. Describe the role of physical and other non-pharmacological modalities (taping, casting, electrical stimulation etc.) in managing spasticity C3. Describe the mechanisms of action, indications, benefits and potential adverse effects of oral spasmolytics C4a. Describe the mechanisms of action, indications, benefits and potential adverse effects of botulinum toxin C4b. Describe differences amongst different botulinum toxin formulations C4c. Perform botulinum toxin chemodenervation

Conclusions:

- Deficiencies in training of physicians for spasticity management may be due to lack of expertise and resources, local unavailability of emerging management techniques, and rarity of the need for procedures
- The ToxNet group has identified opportunities to increase education and optimize spasticity care by developing and disseminating a comprehensive educational curriculum resource

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