ABOUT ME

“All we have to decide is what to do with the time that is given us.” — J.R.R. Tolkien

Why the CMT CPG is so much fun!
Refer to PCP & PT

- Infants with:
  - positional preference
  - reduced neck ROM
  - SCM mass
  - facial asymmetries
  - plagiocephaly

"...as soon as asymmetry is noted..."
Refer to PCP & PT

- *Research post-2013 continues to show positive benefits of earlier referral:*
  - benefit start Tx prior to 3 mos (Christensen et al., 2013; Kaplan et al., 2013)
  - = shorter duration of PT to “complete resolution” (Lee, 2014)
  - duration mitigated by severity (Lee, 2014; Jung et al., 2015)
    - SCM mass
    - degree of head tilt
    - plagiocephany

**UPDATE**

REFER BACK TO PHYSICIAN IF RED FLAGS

CPG ACTION STATEMENT 5
Back to PCP if Red Flags

- poor visual tracking
- abnormal tone
- asymmetries *inconsistent* with CMT
- extracellular masses

“…or when, after 4 to 6 weeks of initial intense intervention, in the absence of red flags, little or no progress in neck asymmetry is noted.”

EXAM BODY STRUCTURES, DEVELOPMENT & PARTICIPATION

CPG ACTION STATEMENTS 7, 9 & 10
Exam Body/Dev./Partic.

- **Body Structure**
  - **posture** - supine, prone, sit, stand
  - **PROM** - neck rotation, SB
  - **AROM** - neck rotation, SB (supine, prone, sit)
  - **palpate SCM** - mass present? tightness?
  - head shape, facial asymmetries
  - screen spine, hips

Exam Body/Dev./Partic.

- **3 strongest negative prognostic factors**
  - SCM mass present
  - >15° PROM deficit in cervical rotation
  - Tx start >3 months of age

- **Increased likelihood of:**
  - **longer Tx duration**
  - **poorer outcome**
  - **need for surgery**

(Christensen et al., 2013; Kaplan et al., 2013)
Exam Body/Dev./Partic.

- Argenta Scale for Plagiocephaly (Argenta et al., 2004)

![Argenta Scale for Plagiocephaly](image)

- Cranial Vault Measurement
  - diagonal difference in mm
  - Example:
    - Diagonal B = 134mm
    - Diagonal A = 121mm
    - 134mm - 121mm = 13mm diagonal difference

- Muscle Function Scale (Ohman et al., 2009)
  - vs. AROM measurement for SB
  - measure both sides
  - validated ≥4 mos
  - use 2+ mos (Kaplan et al., 2013)

![Muscle Function Scale](image)

**Exam Body Structures**

Table 1. Muscle function scale, head position in relation to horizontal line, righting reaction.

<table>
<thead>
<tr>
<th>Score</th>
<th>Described mainly in words</th>
<th>Described with degrees</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Below the horizontal line</td>
<td>&lt;0° (below the horizontal line)</td>
</tr>
<tr>
<td>1</td>
<td>On the horizontal line</td>
<td>0° (on the horizontal line)</td>
</tr>
<tr>
<td>2</td>
<td>Slightly above the horizontal line</td>
<td>&gt;0° to &lt;15° (head above the horizontal line)</td>
</tr>
<tr>
<td>3</td>
<td>High above the horizontal line, but less than 45°</td>
<td>&gt;15° to &lt;45° (head above the horizontal line)</td>
</tr>
<tr>
<td>4</td>
<td>High above the horizontal line, more than 45°</td>
<td>&gt;45° to &lt;75° (head above the horizontal line)</td>
</tr>
<tr>
<td>5</td>
<td>Head almost in vertical position</td>
<td>&gt;75° (head above the horizontal line)</td>
</tr>
</tbody>
</table>

Figure 1. The righting response used to estimate imbalance in muscle function in infants.
Classify Severity

* **Grade 1 - Early Mild** = birth-6 mos, muscle tightness
  <15° cervical rotation  or  postural preference

* **Grade 2 - Early Moderate** = birth-6 mos, muscle tightness
  15-30° cervical rotation

* **Grade 3 - Early Severe** = birth-6 mos, muscle tightness
  >30° cervical rotation  or  SCM mass
Classify Severity

- **Grade 4 - Late Mild** = 7-9 mos, muscle tightness <15° cervical rotation or postural preference
- **Grade 5 - Late Moderate** = 10-12 mos, muscle tightness <15° cervical rotation or postural preference
- **Grade 6 - Late Severe** = 7-12 mos, muscle tightness >15° cervical rotation
- **Grade 7 - Late Extreme** = 12+ mos, muscle tightness >30° cervical rotation or 7+ mos w/ SCM mass

(from CMT CPG. Kaplan et al., 2013)
Classify Severity

- Research is currently in the works on *reliability* and *validity* of the seven CMT grades (look for publication in 2017-18)

- Recent papers continue to distinguish severity w/ emphasis on:
  - < vs. > 15 degrees mm. tightness
  - presence of SCM mass

**UPDATE**

PROVIDE 5 FIRST-CHOICE INTERVENTIONS

CPG ACTION STATEMENT 12
5 First-choice Tx’s

- Stretching/PROM (most commonly reported Tx)
- AROM (neck & trunk)
- Symmetrical movement in weight-bearing postures
- Environmental adaptation
- Education!

(From CMT CPG. Kaplan et al., 2013)

Stretching 1 rep x 30 sec, 4x/day, 7 days/week (Christensen et al., 2013)

- based on literature around “clinical expertise, health and injured adult muscle tissue, as well as healthy pediatric muscle tissue” - not specified in CPG

100x/day better than 50x/day (10-15 sec each) (He et al., 2016)

- degrees improvement at 8 weeks:
  - head tilt 17.88° vs. 10.42° (p < 0.001)
  - rotation 34.42° vs. 18.96° (p < 0.05)
  - SB 18.65° vs. 13.54° (p < 0.05)
**Frequency**

- SCM mass
  - 1-3x/wk
- >15° restriction?
  - 1-3x/wk
- >3 mos?
  - 1-3x/wk
- no SCM mass and <15° restriction and <3 mos?
  - weekly or less

(Christensen et al., 2013)
Supplemental Tx’s

- Microcurrent 30min, 3x/wk, x2 weeks (Kim, Kwon & Lee, 2009)
  - improved tilt, neck rotation *immediately post-Tx*
  - mean = 7 mos, many w/ prior stretching program
  - “may be appropriate to try after 2 to 3 months of intervention if changes are slowing”

“...adjuncts to the first-choice intervention when the first-choice intervention has not adequately improved range or postural alignment”

Supplemental Tx’s

- Microcurrent 30 min, 3x/wk, until normal PROM *yielded no significant improvements at 6 month follow-up* (Kwon & Park, 2014)

  *3 month follow-up: 5-24° advantage for cervical rotation; decreased SCM mass size;

  *6 month follow-up: no advantage for cervical rotation; SCM not reassessed :(

UPDATE
Discharge

**Criteria for D/C:**

- full PROM within 5° of unaffected side
- symmetrical active mvm’t (thru *full PROM*)
- no visible head tilt
- age-appropriate motor skills
Follow-up screening in 3-12 months

- posture, developmental skills, structural, neuro, especially once walking achieved

- CPG acknowledges parent/caregiver preference
In a case-control study, infants with CMT showed no delay in GM/FM skills (MABC) at preschool age (Ohman & Beckung, 2013)

- Infants were part of a previous study, CMT no comorbidities
- 28 families chose not to participate in this current study**
- 61% w/ plagiocephaly at 2 mos
- 2 out of 58 in CMT group had gained another diagnosis by preschool age (autism, toe-walk); 7 more reported having speech needs

**No reason given for not participating.

Suggests that uncomplicated CMT might not impact motor skills at 3-5 yrs.
~Summary & Lessons~

3 year retrospective chart review of all cases

Providence Children’s Development Institute (PCDI)

“…the artificiary formerly known as PNCC”

Exclusion criteria:

comorbidities and/or not consistent with CMT

subsequent referral out

self-discontinuation of PT

50 data points…

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Measure:

[3] Date of birth (mm/dd/yy): ________

[4] Date of REFERRAL (mm/dd/yy): ________

[5] Date of 1st PT visit (eval) (mm/dd/yy): ________

[6] Date of last PT visit (DC) (mm/dd/yy): ________

[7] Male¹ / Female²

[8] Left torticollis¹ / Right torticollis²

[9] Insurance: private¹ / Medicaid² / military³ / self-pay⁴

[10] # visits limited? No⁰ / Yes¹

[11] If Yes, # visits allowed (total # for episode): ________

[12] Cervical rotation (choose 1):

1 = postural preference or muscle tightness <15 deg cervical rotation¹

2 = muscle tightness 15-30 deg cervical rotation²

3 = muscle tightness >30 deg cervical rotation³

99999 = Missing data

[13] SCM mass: absent⁰ / present¹ / Missing data

• Medical Hx:


[15] Cranial deformation: No⁰ / Plagio¹ / Brachy² / Craniostyl³ / Missing data

[16] Facial asymmetry (including frontal bossing): No⁰ / Yes¹ / Missing data
• Initiation of “first choice” interventions provided (review first 5 visits; code which visit Tx first provided):

[17] Neck PROM/manual stretch: No/ / 1st visit / 2nd visit / 3rd visit / 4th visit / 5th visit
[18] Neck and trunk AROM: No/ / 1st visit / 2nd visit / 3rd visit / 4th visit / 5th visit
[19] Facil. of symmetrical mvt: No/ / 1st visit / 2nd visit / 3rd visit / 4th visit / 5th visit
[20] Environ./equip adaptations: No/ / 1st visit / 2nd visit / 3rd visit / 4th visit / 5th visit
[21] Parent/caregiver education: No/ / 1st visit / 2nd visit / 3rd visit / 4th visit / 5th visit

• Other interventions provided (review first 5 visits; code if Tx provided at least once):

[22] Kinesiotaping: No/ / Yes
[23] Soft tissue massage (STM): No/ / Yes
[25] TOT/collar/cervical orthosis: No/ / Yes
[26] Tortle/headwear: No/ / Yes

[27.1 – 27.x] List other approaches used (and which visit Tx first provided):

[28] Parent adherence: documented issues / documented adherence / Missing data

• Units & Visit Frequency: (Eval = 2 units)

<table>
<thead>
<tr>
<th>Visit</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td># of units</td>
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</table>

[29] Phone “visit” for DC? (Yn on date)

<table>
<thead>
<tr>
<th>Service date</th>
<th>mm</th>
<th>dd</th>
<th>yy</th>
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Record if assessed on date of service: (otherwise, leave blank; 1st 5 visits +DC; code measurement, not restriction)

<table>
<thead>
<tr>
<th>Cervical rotation (%)</th>
<th>[30]</th>
<th>[31]</th>
<th>[32]</th>
<th>[33]</th>
<th>[34]</th>
<th>DC date (or last visit): Not recorded / Recorded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral tilt? (No/Yes)</td>
<td>[37]</td>
<td>[38]</td>
<td>[39]</td>
<td>[40]</td>
<td>[41]</td>
<td>DC date (or last visit): Not recorded / Recorded</td>
</tr>
</tbody>
</table>

[42] If Recorded, final meas (%):

[43] If Recorded, final: (No/Yes)

[44] Total # visits (w/ phone DC): 
[45] Total # units: 
[46] # visits in 1st month: 
[47] # visits in 2nd month: 
[48] # visits in 3rd month: 
[49] # visits in 4th-6th month: 
[50] # visits after 6 months: 
Summary & Lessons

[report age at referral trends]

Close relationship w/ PMG & partner pediatricians

[report current time referral —> P.T. evaluation]

PROM: % of “full” (reported as 90-110°) vs. ROM number

[report current % of all 5 first-choice interventions]

~___% self-discontinue without our follow-up

[report current “typical” frequency…]

P.T. D/C prior to full ROM &/or with “sl. lateral tilt”

References *up to CPG*

References from 2013-2017


- Öhman A, Beckung E. Children who had congenital torticollis as infants are not at higher risk for a delay in motor development at preschool age. PM&R. 2013;5(10):850-855.