GMFCS Level IV Cerebral Palsy

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Cerebral Palsy: Key Orthopaedic Issues

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GMFCS Levels:

• Descriptive
• Prognostic
• Allows for planning and outcomes analysis
GMFCS in Orthopaedics:

- GMFCS I – won’t need surgery, visits typically start with “we certainly want to avoid surgery…”
- GMFCS IIa – may not need anything sophisticated (maybe soft tissue), possible SDR
  - Kids do very well
GMFCS in Orthopaedics:

• GMFCS IIb – gets tighter, develops crouch, may have great benefit from SEMLS, possible SDR

• GMFCS III – critical population, can we preserve their gait? Careful selection and proper surgery possible may be dramatic
Surgical Admonition:

- Contractures and deformity may NOT be the critical factors in any child wrt mobility and gait
  - Other medical comorbidities
  - Weight
  - Behavioral issues
  - Social and environmental
GMFCS in Orthopaedics:

- GMFCS V – try to keep hips in or resect*, fuse their spines
- Sit well, pain free, quality of life

*I hate this operation
GMFCS Level IV:

- Where do they fit?
- Where does orthopaedics fit?
- Where do they end up as adults?

GMFCS Level IV

Children use methods of mobility that require physical assistance or powered mobility in most settings. They may walk for short distances at home with physical assistance or use powered mobility or a body support walker when positioned. At school, outdoors and in the community children are transported in a manual wheelchair or use powered mobility.
Goal Setting in Orthopaedics:

• Often taken for granted because it is obvious
  - Fracture – straight and healed
  - Scoliosis – sorta straight but mobile
  - GMFCS I, II, and III – inclusion, activity, and (let’s face it) walking
Everyone wants to walk:

- Even with III, we can speak of standing, sitting, but families want walking (and we oblige)
- GMFCS V – walking is off the table and this becomes clear
- Discussions about QOL
GMFCS IV:

• Goal Setting is even more critical in this population
• Balance between dashing hopes / negativity and realism
• “…they said he’d never walk, I hate them…”
What are GMFCS IV Goals?
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• By definition, teenager will not ambulate in community, yet how do we introduce this?
• When do we introduce this?
• How do we set the realistic, attainable goal, and what is that?
GMFCS IV – Stand / Transfer:

• Walking 4 steps with a gait trainer is not functional when you are 25

• Adult adeli suits aren’t cool
GMFCS IV = Standers:

- The difference between full lift and standing for xfers is huge
- The difference bt standing to pull up pants vs lifting off toilet
- This makes a significant impact on future care, QOL
- AND often attainable
How to realize standing goal:

• Attainable $\equiv$ simple
• Principles of gait still applicable
• Requires:
  ➢ Plantigrade feet
  ➢ PF / KE couple alignment
  ➢ Minimal knee flexion contracture
  ➢ Min – moderate hip flexion contracture
Hips in standing:

- Stable hips are still important
- Don’t give up on hips especially if you can establish relationship to standing
- Nearly all same requirements for walking, a few exceptions...
Grant, age 12: Mom swears as his hips were watched and got worse, his standing tolerance diminished
Staged open reduction, femoral and Chiari osteotomies
Returned to standing full time, even taking steps in house
Andrew, 13 years old

- Premature, diplegic
- Can assist with transfer
- Increasing pain with standing
Over 2 years, advised:

• Too risky to relocate
  ➢ Likely to fail
  ➢ Can get infected
  ➢ Better to resect proximal femur
  ➢ Daily narcotic use
At 8 weeks off all narcotics
At 16 weeks back to standing for transfers
Michael, slowing losing the ability to stand, let’s watch it. 2 y later, too late to relocate
Age 12, MRI ordered which confirmed hip could not be put in due to “divot” and pain
Age 13, open reduction, femoral and Chiari, opposite femoral for LLD and symmetry
Age 17, has been standing for transfers, climbs up stairs. He weighs 140, Mom weighs 95 lbs
What about knee contractures:

DFEO for ambulatory children holds up well with very low recurrence (in properly selected children)
Not so certain in this population:

Seems to have far greater recurrence when done for standing as opposed to full time ambulation.
A good population for anterior tether:

Timing is still a bit fuzzy, but around age 10 works well
Carson: age 11, was a III – IV and unclear where he would end up, plates are annoying
2 ½ years later, standing improved, takes some steps, has NOT lost flexion, so we are keeping these in place
Been using screws placed lateral to patellar articulation. Recovery is FAR easier, but return of growth not established.
Finally, the feet:

Restoration of plantarflexion / knee extension moment remains important for success. These feet will never help knees extend...
Osteotomy needs to correct alignment and hold up over time – older kids do better
Concern about longer term arthritic changes likely not applicable for standing
Conclusions GMFCS IV:

- Set attainable goals early, and reiterate this to the team.
- Standing probably matters more and is more attainable in IV’s.
- Overall health status can determine success, not everyone is surgical candidate.
Conclusions GMFCS IV:

• We have all the surgical tools to have substantial and significant impact

• Still requires good decision making, planning, and execution