

## Therapy Considerations in Children with PHACE Syndrome

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## Typical Development : Fine and Gross Motor Skills : Infant

Age	Typical Motor Development
Birth to 4 months	<ul style="list-style-type: none"> <li>Raises head when on his stomach</li> <li>Turns head to both sides</li> <li>Kicks both legs and brings hands to mouth</li> <li>Watches faces</li> </ul>
6 months	<ul style="list-style-type: none"> <li>Pushes up on hands when on his stomach</li> <li>Rolls over</li> <li>Has improved head control</li> <li>Sits and supports his weight with his hands</li> <li>Stands on feet with support</li> <li>Reaches for objects</li> </ul>
9 months	<ul style="list-style-type: none"> <li>Sits by himself with hands free</li> <li>Crawls</li> <li>Pulls up to standing position</li> <li>Picks up small objects, points</li> </ul>



## Typical Development : Fine and Gross Motor Skills : Toddler

Age	Typical Motor Development
12 Months	<ul style="list-style-type: none"> <li>Stands for short time and walks with or without help</li> <li>Lowers self to sitting from standing</li> <li>Bangs objects or claps</li> <li>Puts objects in a container</li> <li>Begins to scribble</li> </ul>
18 months	<ul style="list-style-type: none"> <li>Gets to stand by himself</li> <li>Squats to pick up objects from floor</li> <li>Steps up using a handrail or hand hold</li> <li>Turns pages of a book</li> <li>Builds a 3-4 block tower</li> </ul>
2 years	<ul style="list-style-type: none"> <li>Jumps with 2 feet</li> <li>Runs</li> <li>Throws and kicks a ball</li> <li>Walks up and down stairs</li> <li>Scribbles and begins to sort items by shape and color</li> </ul>

## Typical Development : Fine and Gross Motor Skills : Pre-School

Age	Typical Motor Development
3 years	<ul style="list-style-type: none"> <li>Balances on one foot</li> <li>Walks up and down stairs with alternating feet</li> <li>Catches a ball</li> <li>Pedals a tricycle</li> <li>Uses a fork/spoon</li> <li>Strings beads</li> </ul>
4 years	<ul style="list-style-type: none"> <li>Hops on one foot</li> <li>Walks backwards on a line</li> <li>Has improving balance</li> <li>Opens and closes large buttons</li> <li>Begins tracing letters and numbers</li> <li>Cuts simple shapes with scissors</li> </ul>

Beyond Pre-school, children are refining their gross motor skills to participate in high level balance activities and fine-tuning fine motor skills



## Therapy Considerations

PHACE defined:

- **Posterior fossa** – brain malformations that are present at birth
- **Hemangioma** – This usually covers a large area on the skin of the head or neck (greater than 5 cm). The term "segmental" is sometimes used to describe these hemangiomas.
- **Arterial lesions** – abnormalities of the blood vessels in the neck or head
- **Cardiac abnormalities/aortic coarctation** – abnormalities of the heart or the blood vessels that are attached to the heart
- **Eye abnormalities**



## Posterior Fossa Involvement : Physical Therapy

Anomalies to the Posterior Fossa can play a large role in a child's ability to participate in age appropriate balance activities

- **Ataxia:**
  - Decreased coordination and difficulty controlling movements
  - May have difficulty with hand writing
  - Motor planning: knowing what step comes next
  - Kids may be looked at as "clumsy" with mild posterior fossa involvement
- **Muscle Weakness and Muscle Tone:** Often associated with truncal weakness. Hyper or hypotonia difficulty contracting and relaxing muscles at the appropriate time
- **Mobility and Walking:** Discoordination with stairs, running, balance, tandem gait



### Posterior Fossa Involvement : Physical Therapy

[http://www.posteriorthrapy.com/wp-content/uploads/2015/02/P1\\_main1.jpg](http://www.posteriorthrapy.com/wp-content/uploads/2015/02/P1_main1.jpg)

<http://www.napacenter.org/programs/physical-therapy/>

<https://www.grandstrand.com/services/pediatrics.html>

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### Posterior Fossa Involvement : Occupational Therapy

- Sensory Integration
  - bothered by certain textures, light touch, or quick changes in movement
  - comforted by pressure, deep touch, or gentle rocking
- Visual Motor Integration
  - How well your child's hands (motor coordination) and eyes (visual perception) work together
  - Important for handwriting, attention, motor planning, sense of where his body is in space also help him to use his hands and eyes together

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### Posterior Fossa Involvement : Occupational Therapy

<http://www.intherapyservices.com/>

<http://childrenstherapyconnections.com/what-you-need-to-know-about-sensory-processing-disorder/>

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### Posterior Fossa Involvement : Speech and Language Therapy

- Several Speech Therapy Considerations
  - Dysphasia
  - Dysarthria
  - Language Deficits
  - Apraxia

See next lecture!

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### Hemangioma

- If close to the eye, may cause problems with vision development in that eye
  - Vision plays a large role in gross/fine motor development and balance
- May break open and bleed
  - Typically very painful, and require immediate attention
    - Signs of pain in infants: fussiness, poor feeding, poor sleeping which can lead to delayed development
- **Migraines, seizures, developmental delays, and rarely ischemic strokes are still may still develop even after resolution**

[https://www.updatdata.com/content/ghar-cystic-hemangioma-features-in-PMAC28.aspx?articleid=1145&url&articleTitle=1138&page\\_type=detail&display\\_rank=1](https://www.updatdata.com/content/ghar-cystic-hemangioma-features-in-PMAC28.aspx?articleid=1145&url&articleTitle=1138&page_type=detail&display_rank=1)

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### Arterial Lesions - Cerebrovascular

- Abnormality of large cerebral arteries:
  - Dysplasia
  - Stenosis, occlusion, absence, or moderate to severe hypoplasia
  - Aneurysm
  - Moyamoya vasculopathy
  - Acute ischemic stroke
    - Signs of stroke: change in neurologic status, seizures, twitching, weakness on one side of body

<http://pediatricsaia.info/posterior-cerebral-artery-widening>

<https://childrensmayoclinic.com/brain-supply-of-the-brain/>

<https://radiopaedia.org/articles/moyamoya-disease-1>

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## Cardiac Anomalies and Coarctation of the Aorta/Congenital Heart Disease

- Coarctation of the Aorta
  - If mild, may be overlooked in the first year of life
  - Most common symptoms: poor appetite, failure to thrive (often associated with developmental delay), dyspnea on exertion, chest pain, headaches or nosebleeds due to increased pressure, sweating, cold feet/legs due to decreased perfusion to the lower half of the body (can be exercise induced), decreased or absent pulses in the lower half of the body
  - If surgically repaired, they have a high risk of vocal cord paralysis due to close proximity of the vagus nerve (talk to SLP) about this

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## Cardiac Anomalies and Congenital Heart Disease: Physical Therapy Intervention

- Energy Conservation
- Importance of a structured exercise regime including a warm up and cool down
- Participation in endurance testing including 6 minute walk test, modified shuttle walk test, time up and go
- Understanding of activity limitations before and after surgical interventions and be aware of signs of exercise intolerance



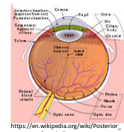
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## Eye Abnormalities

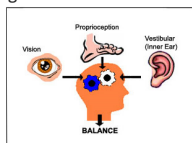
- Posterior OR anterior segment abnormalities
- Cranial nerve III (oculomotor) palsy
- Horner syndrome
- Impaired vision = impaired balance, decreased object exploration, decreased drive to participate in fine and gross motor activities



https://en.wikipedia.org/wiki/Posterior\_segment\_of\_the\_eye



https://www.researchgate.net/publication/304616106\_y/hl/articles/424070



http://drjanjhalak.com/VertigoTreatment\_Mumbai.html

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## How do I know if my child would benefit from Physical or Occupational Therapy?

- Do you find that your child has poor balance or is described as clumsy?
- Do you find that your child has difficulty with hand/eye coordination?
- Does your child have difficulty keeping up with his/her peers or fatigues quickly?
- Is your child failing to meet fine and gross motor milestones?
- Does your child have trouble attending to tasks? Does your child avoid getting messy or have issues with different textures?
- Does your child have difficulty with handwriting?

**Your child may benefit from a physical or occupational therapy evaluation**

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## References

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