Back To Chiropractic CE Seminars

Pediatric Hx & Exam ~ 4 Hours

Welcome to Back To Chiropractic Online CE exams:

This course counts toward your California Board of Chiropractic Examiners CE.
(also accepted in other states, check our website or with your Chiropractic State Board)

The California Board requires that you complete all of your CE hours BEFORE the end of your Birthday month. We recommend that you send your chiropractic license renewal form and fee in early to avoid any issues.

Exam Process: Read all instructions before starting!

1. You must register/pay first. If you haven't, please return to: backtochiropractic.net

2. Open a new window or a new internet tab & drag it so it's side-by-side next to this page.

3. On the new window or new tab you just opened, go to: backtochiropractic.net website.

4. Go directly to the Online section. DON'T register again.

5. Click on the Exam for the course you want to take. No passwords needed.

6. Follow the Exam instructions.

7. Upon passing exam, you'll be able to immediately download your certificate, and it'll also be emailed to you. If you don't pass, you must repeat the exam.

Please retain the certificate for 4 years. DON'T send it to the state board. If you get audited and lose your records, I'll have a copy.

I'm always a phone call away... 707.972.0047 or email: marcusstrutzdc@gmail.com

Marcus Strutz, DC
Back To Chiropractic CE Seminars

Pediatric History and Exam

Liesel Orend DC LAc CACCP

General Considerations

The process of obtaining a history and completing an exam for a child is different than that of an adult

We need additional information to be able to treat babies and children

A thorough intake form will assist in this process, especially as a means of obtaining information from the parent without the child having to listen in.

Intake Form Considerations

Set up your intake process so that parents can fill out forms in advance, preferably before they arrive at your office.

Parents may need to gather information, look up medications, records, or names of doctors and specialists.

You will get better information if parents are not rushing through forms in your waiting room while entertaining their toddlers!

What information do you want on your intake form?

Basic Intake Information

Child's name

Date of birth

Parent’s names, ages, occupations

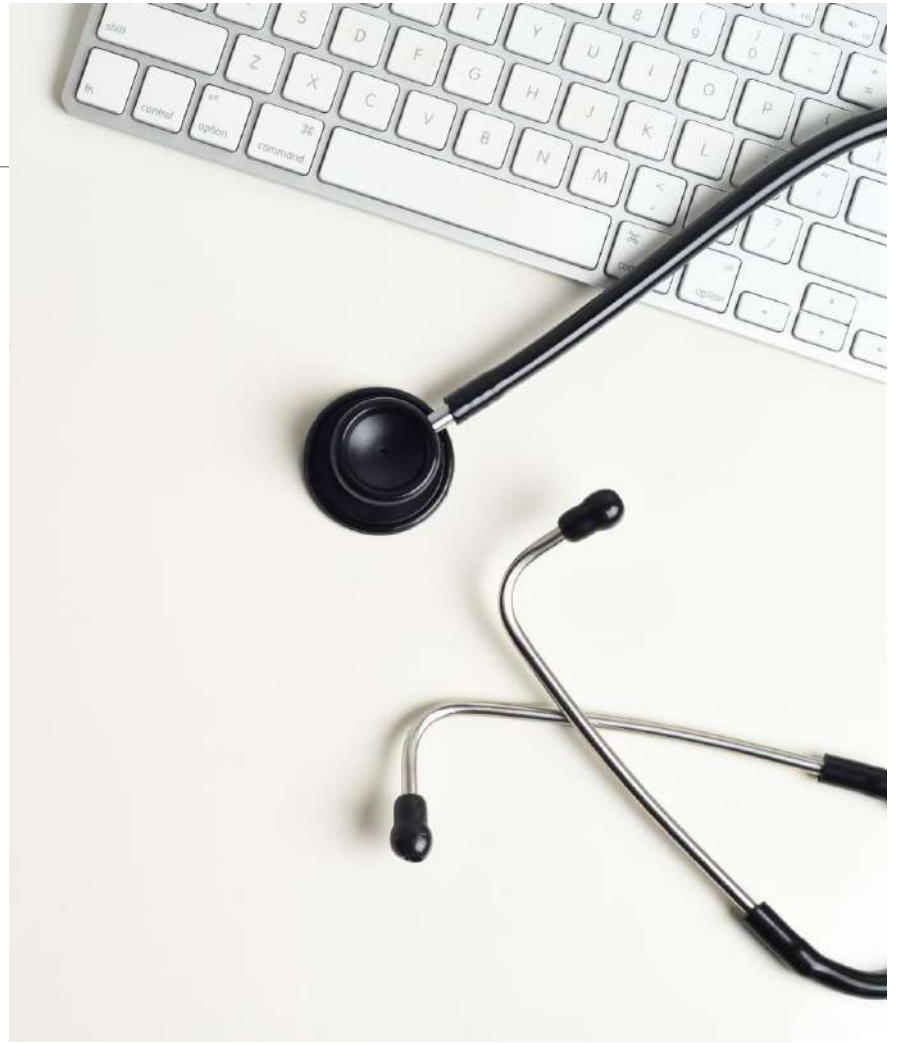
Marital status of parents

Family Information

- Siblings, ages, any health issues
- Caregiver arrangements: child with parents, babysitter, day care, school, etc.

Other Providers

- Minimally, obtain the name and phone number of the child's pediatrician.
- Last exam date and result
- Consider obtaining permission to contact PCP up front.
- If there are other specialists involved, obtain this information as well.



Chief Complaint

Main issue for which they are seeking help

History of the problem

Any other treatment or advice that has been sought for that problem

May also be a well-child evaluation

Prenatal History

Very important to obtain history of the pregnancy and birth.

Health of mom

Fertility treatments that lead to conception

Testing during pregnancy: amniocentesis, ultrasounds

Any complications during pregnancy:

- Diabetes
- Pre-eclampsia
- Smoking/Alcohol/Drug use
- Excess nausea/vomiting

Stressors during Pregnancy

This can be an open-ended question. Pregnancy can be a stressful time for many reasons, including:

- Physical discomfort
- Emotional issues
- Financial Concerns
- Genetic testing or amniocentesis or ultrasound results
- Family dynamics

Labor and Delivery

- Where the birth took place: home birth, hospital, birthing center
- Length of labor
- Vaginal or C-Section
- Any interventions: induction, forceps, vacuum
- Medications
- Any complications

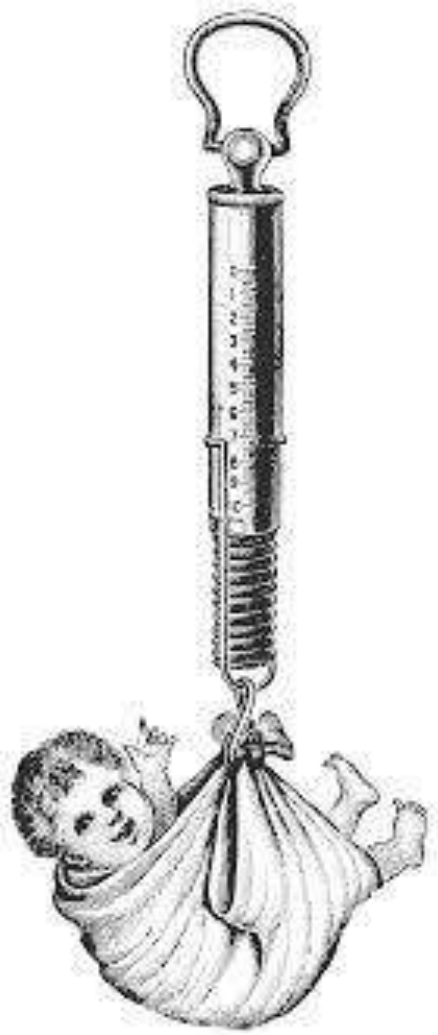
Birth Information

Child's length and weight at birth

Head circumference at birth

Any other issues at birth?

- Jaundice
- Delays in nursing or feeding
- Other medical interventions



APGAR Score

- The APGAR score is an assessment tool, used to evaluate how well a newborn is doing at one minute and five minutes after birth.
- Score is out of 10 points – but scores of 10 are rare.
- Scores of 7-10 are good.
- Scores of 4-6 are moderately abnormal
- Score of 0-3 most likely mean that the child may have required oxygen or other medical intervention at birth.

APGAR Chart

	Score of 0	Score of 1	Score of 2
A: Activity/muscle tone	limp or floppy	limbs flexed	active movement
P: Pulse/heart rate	absent	less than 100 beats per minute	greater than 100 beats per minute
G: Grimace (response to stimulation)	absent	facial movement/grimace with stimulation	cough or sneeze, cry and withdrawal of foot with stimulation
A: Appearance (color)	blue, bluish-gray, or pale all over	body pink but extremities blue	pink all over
R: Respiration/ breathing	absent	irregular, weak crying	good, strong cry

Significance of APGAR Score

It gives the clinician an idea of how stressed the baby was at birth.

Sometimes parents don't remember this information, but it is available in the child's birth record.

If the scores are not available, ask how the baby was at birth, and if any interventions were required.

Fun Facts

Dr. Virginia Apgar was an obstetrical anesthesiologist and medical researcher.

She created the APGAR score in 1952, using her name as a mnemonic for each of the five categories.

This simple system resulted in countless saved lives, because it required doctors to assess the newborn baby and intervene accordingly.

Assessing Birth Trauma

Ask parents about other birth challenges or signs of birth trauma:

- Bruising
- Respiratory distress at birth
- Very fast birth or very long labor
- Odd shaped head
- Cord around neck

Structural issues at birth

- Difficulty using one arm
- Head rotated or tilted

If birth in hospital, how long before mom and baby went home?

Developmental Milestones

Helpful to have the major milestones on the intake form. This does not have to be in-depth, and you will gather more information in your physical exam.

Ask a few general questions. At what age did the child first…

- sit up?
- crawl?
- walk?
- talk?

Development Questions

Follow with open-ended questions:

Were the developmental milestones reached?

Any skills the child struggled to master?

Was the child evaluated for developmental delay?

Check list for common newborn and baby issues:

- Colic
- Difficulty nursing or using a bottle
- Cradle cap
- Thrush or yeast infection
- Constipation
- Diarrhea
- Fevers
- Allergies
- Eczema
- Jaundice as a baby

Check list for common childhood issues:

- Finicky eating
- Allergies
- Chronic ear infections
- Excessive colds and flus
- Asthma
- Stomach aches
- Diarrhea
- Bed wetting
- Constipation
- Growing pains

Sleep

TROUBLE FALLING ASLEEP

WAKING EARLY

NIGHTMARES

Physical History

- Has the child been in any accidents?
- Any falls or injuries?
- Poor coordination or posture?
- Scoliosis screening?
- Hearing exam?
- Vision exam?

Mental/ Emotional/ Behavioral Issues

- Excessive tantrums
- Fears/Phobias
- Defiance
- Hyperactivity

Social Issues

- Does the child have difficulty playing with other children
- Difficulty following directions
- Difficulty taking turns or losing at games
- Trouble making friends

School Age Children

Parents may not see issues with their children until they attend school

Issues with vision, hearing, language, and attention surface as academic demands increase

Ask if any assessments have been done:

- Speech evaluation
- Learning impediments
- Other evaluations

Nutrition

Was the child breast fed? Until what age?

Did the child receive formula? At what age? What kind?

At what age were solid foods begun?

Any food sensitivities or allergies?

Picky eating, or limited diet?

Nursing challenges

Any issues with nursing?

- Painful for the mother
- Ability to latch, continue nursing
- Child prefers one side

Has the child been assessed for tongue-tie?

Have any releases been performed?

If so, at what age?

Diet

Better to ask what the child eats than to ask how their diet is

Describe a typical diet for your child:

Breakfast

Lunch

Dinner

Snacks

Medication

What is the child taking currently?

What have they taken in the past?

Specifically, looking for a history of antibiotic use, Tylenol, etc.

Supplements

What vitamins is the child taking?

Any other supplements?

Any herbal remedies?

Vaccinations

Just the facts, Ma’am….

What vaccinations has the child had?

Any reactions to vaccinations?

Family History

Cancer

Heart Disease

Scoliosis

Mental Illness

Learning challenges

Seizures

Immune challenges

Open ended questions

Has your child had any serious illness or health challenges?

What questions would you like to address during this appointment?

What concerns do you have?

What do you want to ask during the history intake?

History

If you've got a thorough intake form, you'll have a lot of information already. But it is still important to allow parents to tell their story.

Make sure that you:

- Listen without judgement
- Ask follow up questions
- Relate to the child as well as to the adult
- Observe the child and the caregiver as they speak

Milestone Checklist

Review developmental milestones appropriate to the age of the child. You will need to ask caregivers about the ones you cannot observe.

The CDC milestones can be found here:

https://www.cdc.gov/ncbddd/actearly/milestones/index.html

This chart, from University of Alberta, is very handy:

https://pedscases.com/sites/default/files/SNAPSHOTS_Developmental_Milestones_Chart_UPDATED_Aug_2014.pdf

Expand on concerns

This is the place to learn more about anything that is mentioned on the intake form.

Make sure that you address any questions or concerns that the parents included on the form.

Remember, new parents may be....

- Sleep deprived
- Dealing with hormonal changes from pregnancy and birth
- Anxious for the well being of their child
- Anxious to do everything right
- Skeptical of you

Consider the impact

Consider the impact of your questions on the child.

- Even very young children and babies understand some words.
- Even if they don't understand the words, they hear the stress tones in their parent's voices.

Consider the impact of your questions on the parent.

- No parent wants to be judged or criticized.
- Parents want to feel that they are doing the right thing by consulting you.

Adjust your words and tone accordingly.

Private History Intakes

There is always the option of conducting history interviews privately, without children present.

- Parents will be able to speak more freely
- It’s often not good for children to hear what is “wrong” about them.

When to consider private interviews

- If the child has significant disabilities or behavioral challenges
- If the child's medical condition is serious or complex

Face to Face

Always address the child, and include the child in the conversation

Ask the child questions – you will be amazed what you learn!

Physical Exam

Rapport

The whole exam is also your time to build rapport with child and caregiver.

It’s critical to connect with the child.

You are gathering information, but at the same time, remember that everything you do impacts their trust in you.

Be sensitive to their needs, ready to change the order or pace of your exam.

Rapport with an infant

Speak to the baby, chat while you are observing

Ask permission to touch, then touch the baby to allow them to get used to your touch,

Babies' heads are very sensitive, don't start there

Be ready to conduct part of your exam with baby in mom's arms.

Babies and young children can lie on the parent or caregiver.

Rapport with a child

Speak directly to the child

Ask them questions, if they have any pain anywhere, or if they have anything they want you to work on.

Tell them exactly what you are going to do, before you do it.

Starting with standing assessments is a great way to get them engaged.

Pediatric Equipment

Baby scale

Measuring Tape

BP cuff for infants/children

Gloves/Finger cots

A few visually engaging toys

Vitals

Blood pressure

Heart Rate

Respiration

Height

Weight

Head Circumference – for babies

Normal Ranges for Vitals

Age	Normal blood pressure range (mm Hg)	Normal heart rate (beats per minute)	Normal respiratory rate (breaths per minute)
0 to 3 months	65–85/45–55	110–160	30–60
3 to 6 months	70–90/50–65	100–150	30–45
6 to 12 months	80–100/55–65	90–130	25–40
1 to 3 years	90–105/55–70	80–125	20–30
3 to 6 years	95–110/60–75	70–115	20–25
6 to 12 years	100–120/60–75	60–100	14–22
12 to 18 years	100–120/70–80	60–100	12–18

https://health.clevelandclinic.org/pediatric-vital-signs/

Growth

A baby's growth is carefully tracked, especially soon after birth.

It is important to make sure that infants are receiving the nourishment they need to grow.

Weight gain in newborns can be a significant source of stress for new parents, as breastfeeding is established.

There is a significant difference in the growth patterns of breastfed vs. formula fed babies

Failure to thrive will be diagnosed if the infant does not gain weight appropriately, or stalls in their growth pattern. This can be due to an underlying medical condition, developmental delay, or malnutrition.

Weight gain in infancy

Generally, newborns will lose weight initially, because of fluid changes

They should return to their birth weight by the second week.

Normal weight gain by month

Age	Normal Monthly Weight Gain
0-3 months	2 lbs
3-6 months	1.25 lbs
6-9 months	1 lb
9-12 months	12 oz
1-3 years	8 oz

Tracking Growth Patterns

The CDC recommends using WHO growth charts for ages 0-2, because the are based on breastfeeding infants, and (according to the CDC) represent ideal growth patterns, rather than those that are typical in the United States.

After age two, the CDC recommends their own charts, because they can be used up to age 19.

https://www.cdc.gov/growthcharts/who_charts.htm#The%20WHO%20Growth%20Charts

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General Appearance - babies

Evaluate the baby's overall appearance

- Affect – sleeping, crying, alert, upset, happy
- Skin – pale, red, pink, yellow, look for rashes
- Overall tone – tense, relaxed
- Movement – fluid, jerky
- Head shape
- Symmetry of face, mouth, jaw

Physical Exam for Babies

- Passive range of motion : Torso, Cervical, Extremities ROM can be combined with your neurological evaluation of tone
- Spinal Exam: static and motion palpation

Spinal Exam – Static Palpation

Gently Palpate:

- Posterior atlas
- Posterior cervical spine
- Spinous and transverse processes in the thoracic spine
- Spinous and mamillary processes in the lumber spine
- Tubercles in the sacral segments

Feel for misalignment, muscle rigidity, edema, tenderness

Motion Palpation

Infants' spines are not fully formed, so it is important to use a gentle gliding motion.

Do NOT assess end play; instead feel for subtle resistance.

Remember that the bones have not yet fully ossified.

Occiput and atlas can be checked for Lateral-Medial motion, as well as A-P and P-A motion

The rest of the cervical spine, as well as thoracic and lumbar spines, can be gently pressed to evaluate P-A

Cranial Exam

Measure circumference of head

Gently palpate fontanelles

Shape of head, assess for plagiocephaly

Gloved finger in mouth, assess sucking ability

Assess palate, is it high? Shallow?

Feel and look for tongue and lip ties

Measuring the infant h

Head circumference is recorded on a growth chart

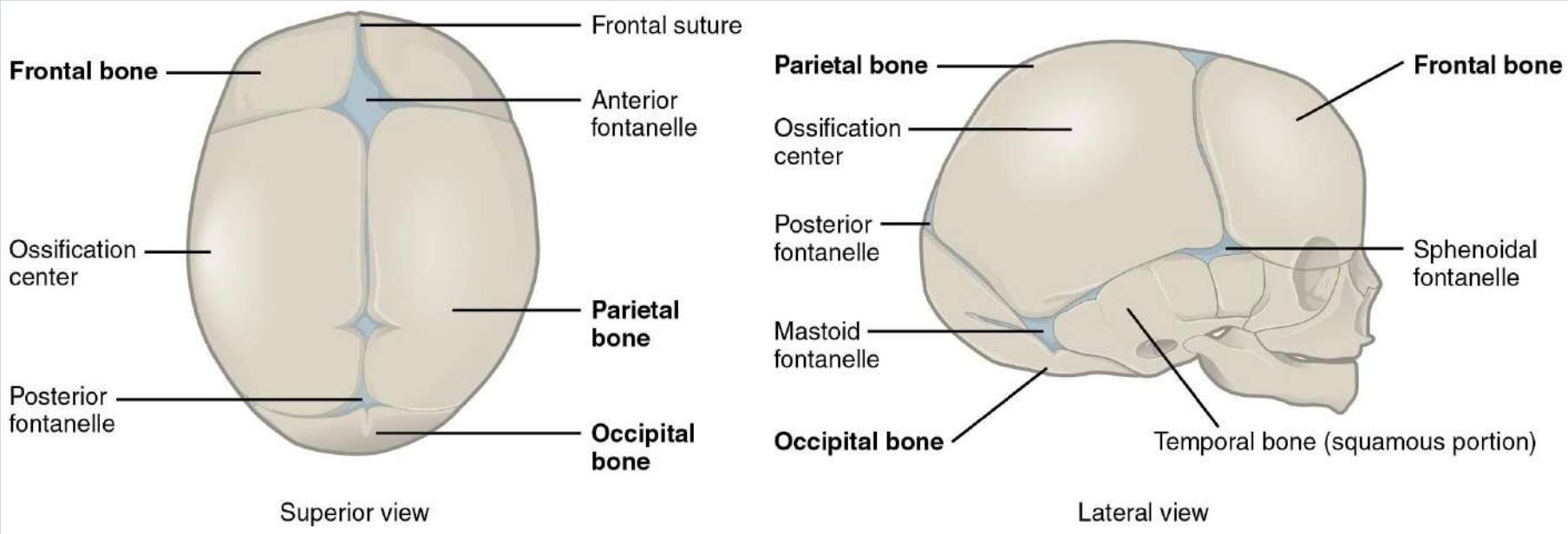
Checks for microcephaly or macrocephaly

Development of head size should be in proportion to other growth patterns.

Measure from glabella to EOP

Fontanels

The two on the top of the head, anterior and posterior, are the most often assessed. Check to see that they are neither sunken (indicating dehydration) nor bulging (indicating hydrocephalus, a medical emergency)



Ages for Fontanel Closing

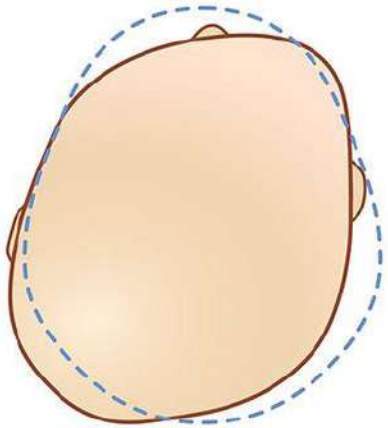
Posterior Fontenelle: 2 – 3 months

Sphenoidal Fontanelles: around 6 months

Mastoid Fontanelles: 6 – 18 months

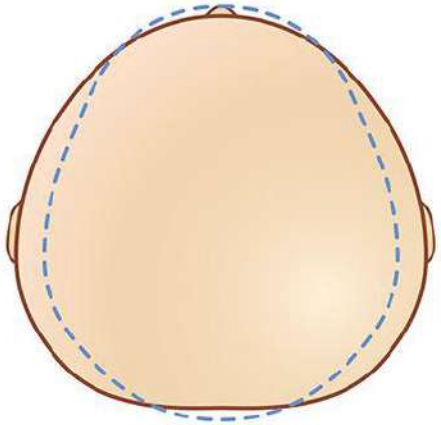
Anterior Fontenelle: 1 – 3 years

Abnormal Head Shapes



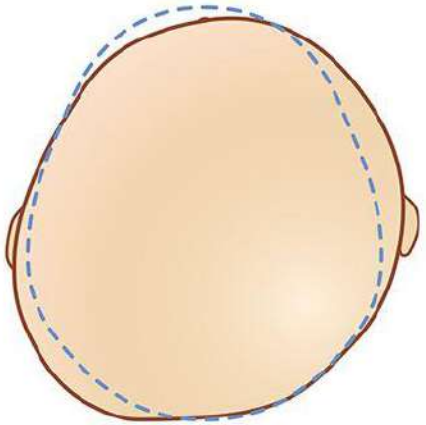
Plagiocephaly

Baby's head looks asymmetrical as it is flattened on one side, and ears may be misaligned.



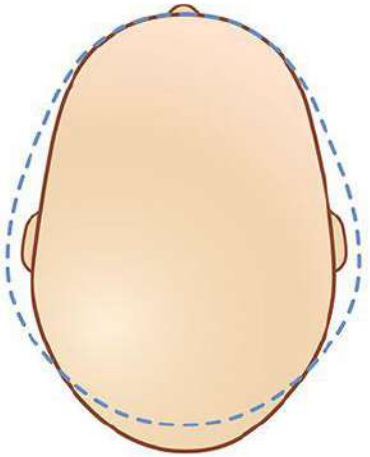
Brachycephaly

Head begins to widen, as the back of the head starts to flatten.



Asymmetrical Brachycephaly

Similar to brachycephaly, however the baby's head also appears asymmetrical.



Scaphocephaly

An early fusion of the sagittal suture, causing a long, narrow skull.

Images courtesy of Orthomerica Products, Inc.

Craniometer

Mimos makes a good tool to measure and document plagiocephaly

Assessing Suck Reflex

Place a gloved little finger in the baby's mouth, toward the front of the tongue, after checking for the rooting reflex

0 – No tension is created, spits out finger

1 – Tongue doesn't wrap finger, weak, cannot move finger, may roll tongue side to side, may have early gag reflex

2 – Accepts finger and closes mouth around it, tongue comes up, cheeks may not round outward from appropriate suckling pressure, early fatigue

3 – Tongue wraps finger, good strength, full response with little rest, cheeks round with full pressure and tight seal

4 – Hard clamp or biting

5 – Powerful suck, moves whole hand, full face wrinkling and dimpling

Miller, Joyce. *Breastfeeding Difficulties and Chiropractic Case Studies*, 2001, www.spinallogicchiropractic.com/wp-content/uploads/2012/12/Breast_Feeding.pdf.

Tongue and Lip Ties

Commonly found, these are essentially tissue that has failed to separate, and binds the tongue or the lip to the mouth.

They can lead to nursing issues, and later to speech and other issues for the child.

They are a hot topic these days, and you will undoubtedly be asked to check for them if you examine babies.

Developmental Dysplasia of the Hip

According to the International Hip Dysplasia Institute:

1*in*10 infants are born with hip instability

1*in*100 infants are treated for hip dysplasia

1*in*500 infants are born with completely dislocated hips

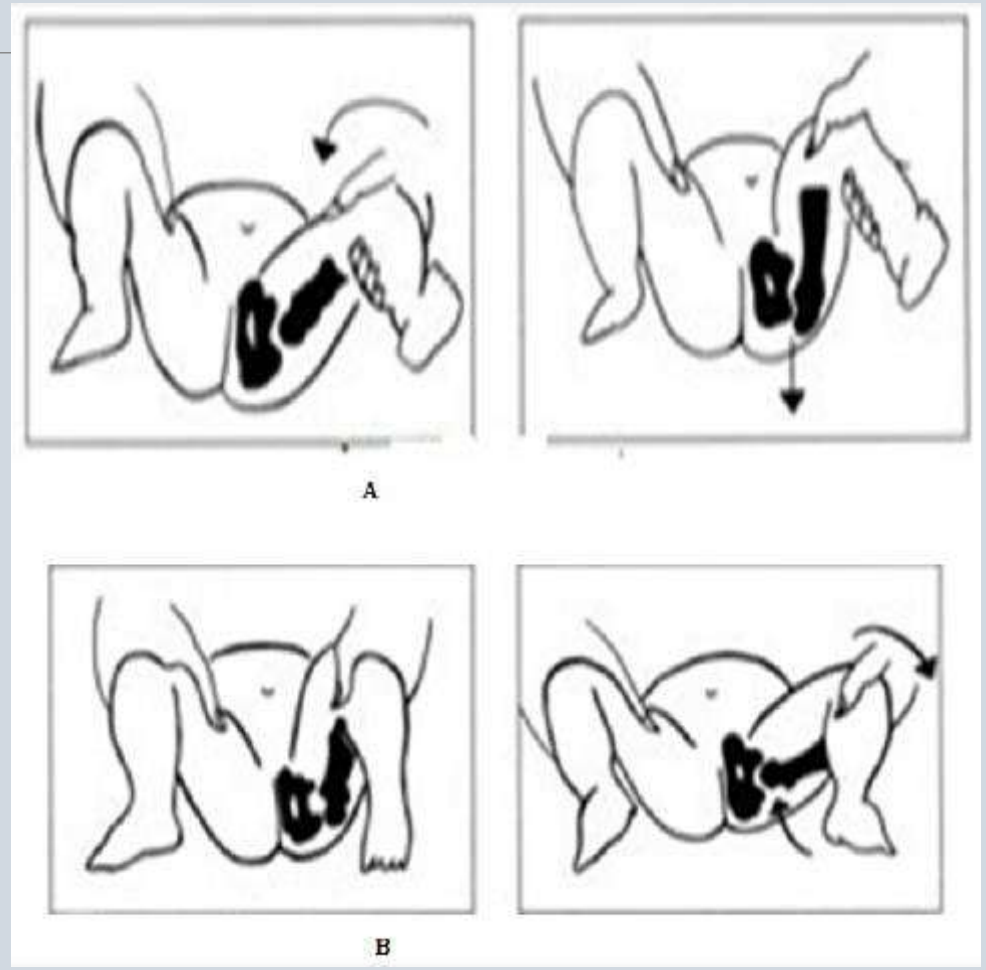
It is a serious condition that needs to be identified as soon after birth as possible. Without treatment, limping or painful arthritis can result.

https://hipdysplasia.org/

Barlow and Ortolani's tests for Hip Dysplasia

A. Barlow Test –Grasp the infant's thigh near the hip and with gentle posterior/lateral pressure, attempt to dislocate the femoral head from the acetabulum. Normal: no motion in this direction. Positive: a distinct "clunk" may be felt as the femoral heads pops out of joint.

B. Ortolani Test –hip is abducted and gentle pressure is applied to the proximal thigh from behind. Positive: If the joint is dislocated, a palpable "clunk" is noticed as the head slides back into place.



https://med.stanford.edu/newborns/clinical-rotations/residents/residents-newborn-exam/barlow-and-ortalani-manuevers.html

Torticollis

Congenital muscular torticollis results from tightness in one SCM, resulting in the baby's ear being pulled down toward that side, and their head rotating in the opposite direction.

Can lead to plagiocephalpy, with flattening on the back of the cranium on the side the baby is looking towards.

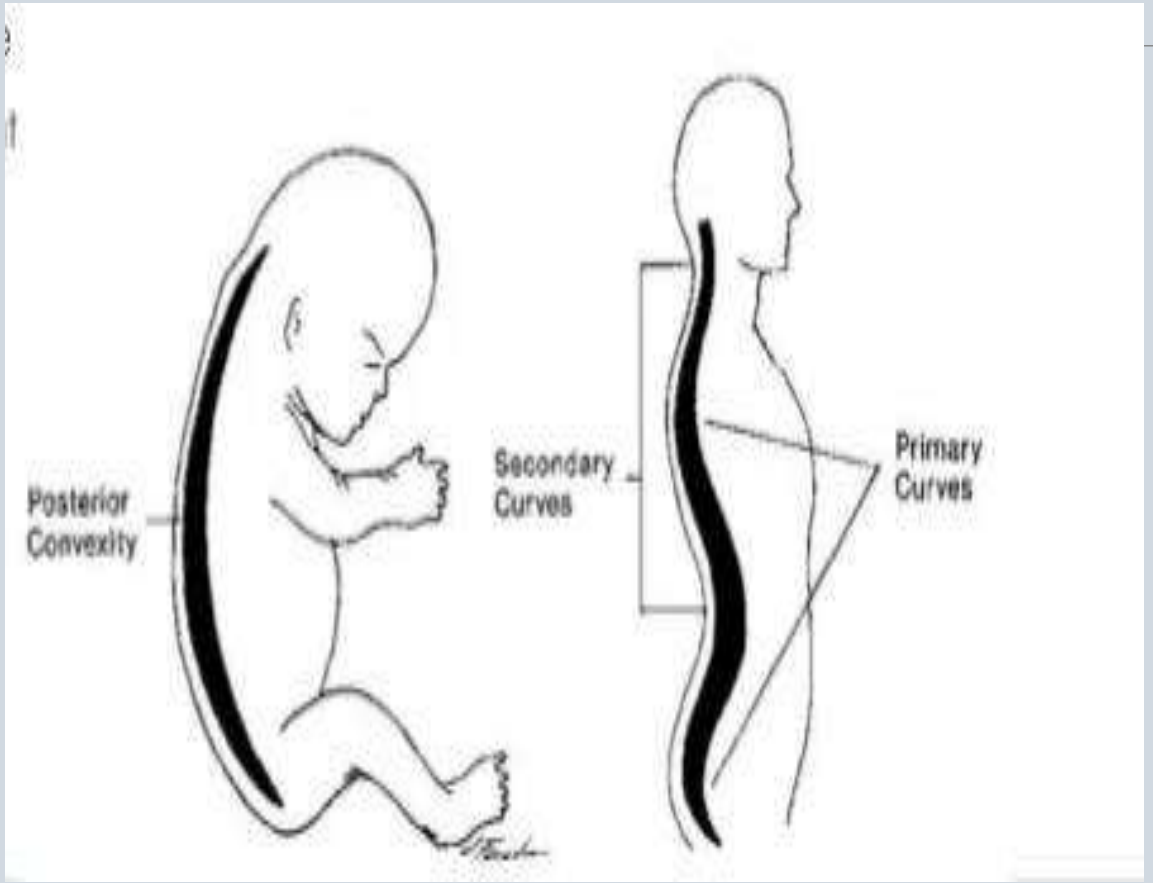
May be able to palpate a muscular mass on the affected SCM

Physical Exam – Ages 2+

Children are generally standing and walking, as well as able to follow instructions. You can incorporate the following into your physical exam:

- Your spinal exam can include assessment of the development of spinal curves
- You can evaluate posture
- You can evaluate gait
- You can check gross motor skills, such as standing on one leg, hopping, jumping

Development of Spinal Curves



Primary curve emerges at 4 weeks in the embryo

1st Secondary Curve: Cervical lordotic curve, begins at 3-4 months, when infant can hold its head up

2nd Secondary Curve: Lumbar lordotic curve, emerges between 12-18 months, when the baby begins to walk

Posture

Evaluate standing posture, have child march in place a few times to see a more natural stance.

Check:

- Head tilt or rotation
- Forward head carriage
- Shoulders level
- Hips level
- Leg or hip flare
- Genu valgus or varus
- Foot pronation or supination

Gait

Have child walk, ideally at least 20 feet.

Look for:

- Heel-toe gait
- Arm Swing
- Any jerkiness or abnormal movement

Scoliosis Screening

Important that chiropractors assess for scoliosis, by 10 years old.

Often schools will assess in middle school, but signs may be present much earlier.

Functional or Structural

Functional scoliosis: curve will disappear with Adam's test and with lateral flexion.

- Common causes are true anatomical short leg, pelvic asymmetery, foot pronation, or muscle spasm

Structural scoliosis: curve will not disappear with movement, and will often generate a hump.

Scoliosis Screening Procedure

- Need to see the entire spine, so children can wear shorts, girls two-piece bathing suits, or use gowns
- Look for asymmetry of pelvis or shoulders
- Look for lateral spinal deviation
- Look for associated compensation in head carriage, arm and leg rotation

Adams Test – Forward Flexion

Three stages:

- Patient bends forward 45 degrees, look for rib hump more pronounced on one side
- Patient bends forward farther, look at the thoracic spine
- Patient in full flexion, look at lumbar spine

Measure what you find

Inclinometer or Scoliometer

Differences of 7 degrees or more warrant x-ray evalution.

Neurological Exam

Neurological Exams for Babies

1. Assess tone
2. Assess cranial nerve function
3. Assess primitive reflexes

Evaluation of Tone

For the first two days of life, the infant will likely be in a flexed posture, with extremities held tightly against the body.

This will gradually ease, but flexion will still be dominant.

Tone is assessed by checking the mobility of the trunk and the extremities.

Hypotonia: Too little muscle tone, floppy baby syndrome

Hypertonia: Too much muscle tone, muscles can be rigid or spastic.

Evaluation of Tone: Neck Tone

Rotate baby's head toward the shoulder. The chin should go as far as the shoulder, but not beyond.

A baby with hypotonia of the neck muscles will have poor head control

Evaluation of Tone: Scarf Sign

Grasp baby's wrist and bring it across the chest toward the opposite shoulder

Elbow should come to the midline. If it does not, it indicates hypertonicity. If the elbow moves past midline, it indicates hypotonicity.

Evaluation of Tone: Heel to Ear

With the baby supine, pull one heel toward the ipsilateral ear.

The heel should go to the level of the chest or shoulder.

If it goes to the ear, this indicates hypotonia.

Evaluation of Tone: Popliteal Angle

Flex one of baby's thighs onto their abdomen

Straighten the leg by pushing the ankle

The angle should be about 90 degrees

Cranial Nerve Exam

Since babies can't follow directions or tell us what they sense, most of our exams of the cranial nerves and sensory systems are done by observation.

The Olfactory CN I is hard to test, but babies are born with the sense of smell fully developed.

Cranial Nerves: Vision

Visual: CN II, III, IV, VI

Test pupillary light reflex: Sensory aspect is CN II, and the motor is CN III

Cardinal eye movements CN III, IV, VI: Use a shiny, interesting object; if baby does not follow with eyes, try parent's face (the first thing an infant will track)

Baby can be expected to fully focus on an object and smoothly track objects by about 3 months. Before then, jerky movement is normal.

Convergence will not be present until 8-15 months

Cranial Nerves: Hearing

Acoustic – CN VIII

Baby's hearing is functional at birth but is somewhat immature. They respond best to high pitched sounds and exaggerated voices.

Gross hearing can be observed when checking the Moro Reflex.

Lateralization of sound can be observed by watching the baby turn their head toward a sound

Cranial Nerves: Touch and Motor

Trigeminal V: Observe the jaw for deviation

Facial VII: rooting and sucking ability, observe for any facial asymmetry

Glossopharyngeal IX: observe swallowing

Vagus X: swallowing, check for uvula deviation and symmetry of palate elevation at rest

Spinal Accessory XI: Difficult to test, but check trapezius muscle for tone

Hypoglossal XII: Check tongue for atrophy, tongue should be midline at rest.

Primitive Reflexes

Are present at birth or in utero, then gradually disappear over the first months of baby's life.

Some help the baby navigate the birth process.

Protect newborns from harm by enabling them to automatically respond to stimuli in their environment.

There is a range of ages when reflexes should appear, and when they should disappear. In general, in the infant, we check to see that they are present, while in the older child, we checking to make sure that they are absent.

Significance of Primitive Reflexes

The presence or absence of certain primitive reflexes can provide valuable information about a child's neurological and motor function.

Abnormal or persistent primitive reflexes can be an indicator of neurological or developmental problems, such as cerebral palsy or developmental delays.

Primitive Reflexes in the Infant Exam

Evaluation of primitive reflexes is a large part of the infant neurological exam. They give us insight into the state of the newborn's nervous system, before most other neurologic tests are developmentally possible.

Below are a few of the most commonly evaluated reflexes in infants

Moro Reflex (startle reflex)

Test: loud noise behind infant's head, or hitting the table on which they are lying, loudly. Must be loud and sudden enough to startle.

Look for: baby to rapidly extend, then flex, their arms and fingers

Present at birth

Begins to fade at 8 weeks, should be gone by 5 months

If absent prior to 5 months, indicates neurological dysfunction

Asymmetrical response could indicate brachial plexus dysfunction - a common birth injury

Palmar Grasp

Test: touch or stroke the palm of the infant

Look for: infant's fingers to close and grasp your finger

Present at birth

Weakens around 2-3 months, as it is replaced by volitional movement

Disappears by 4 months

Watch for asymmetrical response, as well as absence, to indicate dysfunction

Plantar Grasp

Test: Press the bottom of baby's foot near the base of the toes

Look for the toes to flex, and grasp your finger

Present at birth

Disappears by 8-15 months

Absence or asymmetry before 2-3 months is significant

Rooting and Sucking Reflexes

Test: Stroke the near the corner of baby's mouth, and they will move their moth toward your finger. Place you finger on baby's lips, and they should begin sucking

Present at birth

Rooting disappears at 3-4 months when awake, 7-8 months asleep.

Sucking reflex disappears by 1 year.

Absence indicates neurologic dysfunction; asymmetry can also point to specific cranial nerve issues:

facial n. sensation, hypoglossal n. tongue, or trigeminal n. motor

Tonic Neck Reflex

Test: Baby is supine, turn head to one side and hold, chest stays flat

Look for baby to extend arm and leg toward side of head rotation, and flex the arm and leg on the opposite side: “fencing posture.”

Present at birth

Disappears by 6 months, sometimes present while sleeping up to 3 years

The posture should ease after a moment. If it does not, and the baby’s arm and leg remain extended, this is called “obligate reflex”, which is abnormal and warrants referral.

Galant's Reflex

Test: stroke one side of the child's back lightly, adjacent to the spine

Look for their hips to twitch or move toward the side you are stroking

Present at birth

Disappears by 4-6 months

Parachute Reaction

Test: Hold the baby horizontally in the air, quickly lower them toward the table

Look for their arms and hands to extend, protecting them from falling on the table

Appears at 8-9 months; does not necessarily disappear

Provides information about the child's developing nervous system and visual response. Watch for asymmetrical reactions as well as absence.

Primitive Reflexes

Reflex	Appears	Disappears
Moro Reflex	Birth	5 months
Palmar grasp	Birth	4 months
Plantar grasp	Birth	8-15 months
Rooting & Sucking	Birth (sometimes over the first few weeks)	After 1st year
Tonic Neck	Birth	6 months
Galant	Birth	6 months
Parachute	8-9 months	Does not disappear

Pathological Reflexes

These two pathological reflexes in adults are normal in babies:

Babinski – the big toe dorsiflexes and the other toes fan. This is a normal response for at least the first year, and may persist until two years.

Ankle Clonus – when the foot is dorsiflexed, you should see a rhythmic beat of the foot. This is normal for the first two months.

Videos of Neurological Tests

These sites have helpful videos of neuro exams for infants:

https://neurologicexam.med.utah.edu/pediatric/html/newborn_n.html

https://med.stanford.edu/newborns/professional-education/photo-gallery/neuro-reflexes.html

Neurologic Tests for Children

These tests can be added as children develop:

- Convergence should be present by about age 3. Test when testing visual tracking, by moving an object from 18 inches away to directly in front of their nose. Look for eyes to converge symmetrically toward the middle.
- Reflex testing becomes more reliable, and should include C5, C6, C7, L4, S1.
- Muscle strength tests can be performed
- Tone is evaluated by manipulating the major joints and noting the degree of resistance

Coordination and Vestibular Development

Once 2-4 year olds can walk and follow directions, you will need to add additional tests to assess development of the nervous system. Some of these skills will still be emerging in the earlier ages.

- Have the child stand with their feet together, close their eyes, and bring their arms in front of them to 90 degrees. Hold for 30 seconds, watch for sway.
- Have the child stand on one foot.
- Have the child hop on one foot 10 times.
- Cerebellar finger to nose testing
- Dysdiadochokinesia tests: pronation/supination of the forearm, rapid toe tapping

Primitive Reflexes

- By this age, most of the primitive reflexes will have disappeared.
- They are replaced by volitional movement.
- Testing for retained primitive reflexes in older children (and adults!) is not part of a general exam, but many chiropractors incorporate this in their practices. Some good resources are:
  - https://www.solvelearningdisabilities.com/
  - The Symphony of Reflexes: Interventions for Human Development, Autism, ADHD, CP, and Other Neurological Disorders by Bonnie Brandes M.Ed.

Putting it Together

- Develop a pediatric exam form, on paper or digital
- Group exams by position: supine, prone, seated, standing
- Be ready to adapt your exam to the needs of the patient
- Practice, practice, practice!

Above all, know when to refer

Recognizing when a child has a serious condition is very important.

- Infants can become very ill, very rapidly
- Serious conditions can benefit from prompt treatment, and it is considered harmful if we delay care
- Many states have early intervention programs for developmental issues, which can be missed if a child's issues aren't recognized

Serious Signs and Symptoms of Babies that Require Immediate Medical Referral

Neonate	Since the health status of a neonate can change rapidly, any signs of illness require immediate referral.
Lethargy	Absence of interaction, hypotonia and/or crying
High Respiratory Rate	Rapid or difficult respirations not related to activity; respiration rate >60 breaths/minute with rib recession
Blue Lips or Tongue	May indicate reduced blood oxygen level
Dehydration	Common sequel to diarrhea or vomiting. Dry mouth, sunken fontanelle, tenting skin, <4 wet nappies/diapers (60-90 mL/4-6 TBS). Urine should be pale and mild smelling.
Pain and Tenderness	Child screams when touched or being moved; avoids being held. Sudden onset of groin pain in a boy may be a sign of testicular torsion; episodic screaming in young children may be a sign of intussusception
Tender Abdomen	Inability to tolerate 2 cm abdominal impression; bloated or rigid abdomen

Vallone SA, Miller J, Larsdotter A, Barham-Floreani J. Chiropractic approach to the management of children. Chiropr Osteopat. 2010 Jun 2;18:16. doi: 10.1186/1746-1340-18-16. PMID: 20525200; PMCID: PMC2887887.

Serious Signs and Symptoms of Children that Require Immediate Medical Referral

Inability to Walk	Refusal or inability to walk in child who previously was walking (or crawling); development of a limp requires attention
Bulging Fontanelle	Evident bulge and rigidity in anterior fontanelle in a quiet child in an upright position
Stiff or Rigid Neck	Refusal/inability to look toward their toes or at a toe placed on their chest may be an early sign of meningitis; very young infants may have meningitis with no obvious signs of neck stiffness
Petechiae	Purple or blood-red spots on the skin that do not blanch with pressure may be a sign of bloodstream infection. Exclude bruises that have an explanation
High Fever	Referral for consult: Neonates (<28days): ≥38 C (100F); 28-90 days >38 C with signs of toxicity or incessant crying; 91-36 months: >39 C (102.2F) and signs of toxicity [58].
Drooling	Sudden onset of drooling not associated with teething, especially when associated with difficult swallowing, may be a sign of epiglottal or pharyngeal infections

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Marcus Strutz DC
Back To Chiropractic CE Seminars
marcusstrutzdc@gmail.com
707.972.0047