Indian Association of Physical Medicine and Rehabilitation

Telemedicine based Rehabilitation Guidelines

for Cerebral Palsy

Disclaimer

These are standard telemedicine-based rehabilitation guidelines for management of cerebral palsy in view of Current COVID 19 pandemic and access to rehabilitation services from patient as well as physiatrist point of view.

These guidelines do not replace standard treatment protocols. No financial help, gifts, sponsorships were received during development of the guidelines.

IAPMR Scientific Committee and Authors have no conflict of interest.

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Index

1. Introduction:

COVID 19 Pandemic has made rehab management new normal. In pediatric rehabilitation services we have to deal with the child and the caregiver so the assessment and management should reflect in the final outcome.

Keeping this in mind an attempt is made for our physiatrists to face the challenging times.

We have designed the following proposals with the following divisions.

1. Tele consultation for the children through their caregivers for new patients.
2. Initial brief physical examination followed by online/video consultations for new patients.
3. For old patients already registered before pandemic and follow up for therapy etc.
4. Physical consultations in the department for deciding about various interventions.

Note:

These are guideline to be followed in PMR Department- Pediatric setting, in additional to SOP (standard Operating Procedures), to be followed as per respective institution and private hospital.

Precautions:

1. Information regarding any contact with covid-19, history of travel and any family member in home quarantine should be sought from each client and staff.

2. Children with excessive drooling will be difficult to keep the masks. To avoid aerosol from drooling, evaluation and therapy sessions should be interrupted for every 5 minutes for cleaning.
3. Athetoid and ADHD and hyperactive kids will cry, hyperventilate and produce lot of aerosol so appointments to be given appropriately.
4. Severe hand involvement will interfere with hand washing for children so required adaptation to be followed (like washing in a container with soap antiseptic solution.)
5. Proper assessment forms should be filled prior to consultations.

2. General Tele Rehab Instructions

- The telemedicine/Tele- rehabilitation proposal should be approved by hospital competent authority as well as from the head of the department.
- Main aim of examination is to ascertain any red flags, compliance of treatment, counselling, establishing communication for long term care and scheduling of timely intervention.
- Tele rehab option should be given to all parents who have difficulties in accessing the centre or have families not well/quarantined at home or child is not well.
- To avail Tele-rehab facility, parents should have a smart Phone with video facility
- Parents with landline/ simple phone to be informed in detail about Tele rehab & only simple instructions to be given to them.
- Parents/Care giver should be capable of operating the required equipment's and apps.
- For Tele- consultation, 3 modes of communication should be used as per convenience. They are- Video, Audio or Text (chat, images, messaging, email, fax etc.).
- Preferred mode of communication for Tele rehab should be live video call or recorded videos.
- The caregiver should be informed about the usefulness and limitations of this method.
- Patient consent is necessary for any telemedicine consultation. The consent can be Implied or explicit depending on the following situations:

- If, the patient initiates the telemedicine consultation, then the consent is implied
- An Explicit patient consent is needed if: A Physiatrist or Caregiver initiates a Telemedicine consultation

- Consent format- Patient can send an email, text or audio/video message. Patient can state his/her intent on phone/video to the Doctor (e.g. "Yes, I consent to avail consultation via telemedicine" or any such communication in simple words). Doctor must record this in his patient information system or medical records.
- For new cases general counselling, education of parent's & basic rehabilitation regarding cerebral palsy should be done via Tele-rehab
- For follow up cases of cerebral Palsy (1st Consultation in PMR is a Pre- requisite before enrolling for (Tele- Rehab)
- Further follow up cases should be encouraged to use Tele-rehab
- The Instructions for examination can be dependent on the part to be examined. Examine the child with only diaper/ Genital cover by cloth.
- The consulting physiatrist should use local language for communication with patents/caregiver.
- Extra care should be taken while dealing patients with associated illness like convulsions, dislocations, severe mental retardation etc.

3. Brief Physical Examination-Instructions:

There are situations when children cannot be managed by teleconsultation alone. Some issues need physical examinations. In such situations whole thing can be approached like this.

- Prior appointment is essential.
- The parent and child should follow the standard operating procedures (SOP) recommended by individual set up.
- On arrival some necessary particulars pertaining to the child should be filled by the front office assistant by maintaining adequate social distancing. (like height weight head circumference with the help of mother. see appendix for forms)
- Assessing the child from far with child lying on the mat; many findings can be noted. Similarly the child can be video recorded for any clarification.
- The doctor's team can view the videos and develop a management plan.
- A specific clinical examination may be needed to verify can be done by specifically examining the child not exceeding 10 minutes.

SECTION: 1. ASSESMENT FORMS

FORM 1 PRELIMINARY FORM

Part 1

(*To be filled in by front office and caregiver during first visit)*

Name of the child Age Gender:

Name of mother / care giver:

Contact Details (phones and area of living

Chief complaints:

Nature of childbirth: Birth Weight Consanguinity Height:

Weight Head Circumference

Part 2:

(To be filled by Paramedical, nurses or junior doctors)

Treatment (previous and present details):

Anticonvulsants and other medications:

Any other issues:

Associated co morbidities history:

(Just mention status, details not required)

Nutrition status:

Vision:

Hearing:

Dysmorphic features:

Communication:

Mental Functions:

Sleep disturbance:

Dysphagia and GERD:

Social background and nature of parental support:

Type of services suggested: (Pease tick)

*Physical assessment Tele rehab and follow up:

*Tele consultation. Tele Health

FORM 2 Tele Consultations

(To be filled by PMR doctors)

(To pick up relevant details from the Form 1)

Look for Neck control, Extensor tone, Rotation on vertical axis and Balance reaction, Classify the child demographically (viz. Hemiplegia, diplegia, quadriplegia, variable, total body involvement)

1. Passive range of motion:
2. Active movement in trunk, upper and lower limbs
   - Tone. (Ask the parent to lift up the child from axilla and look for adductor spasticity, scissoring, knee flexion and equinus in feet with foot deformities)
3. Current milestone details (combined):
   (Physical, cognitive, communication - ref to appendix)
   -Tick appropriate finding
4. Mobility: (Immobile, Pivoting on head, Rolling, Crawling, Creeping, Bottom shuffling, Walking with support , Independent walking)
5. Self-care: (Independent, Physical presence, Partial physical assistance, total dependent)
6. GMFCS: I/II/III/IV/V)(< 2 years to 18 years)
7. Education status:
   (Regular/ Special/ Integrated/ Private Tuition/ Anganwadi)
8. Associated disabilities: Vision, Hearing, speech, Intellectual disability.
   (Use the appendix for specific impairment assessment)

Specific Examination:

Neurological Status:

Persistent primitive reflexes:

*BALANCE: Ask the child to sit on a pillow or stool and ask the parent to tilt the base and look for balance reactions

*POSTURE: Look for the child's ability to maintain his head and trunk against gravity and perform some functions with limbs.

Mobility Types:

Apedal (pivoting, rolling, creeping)

Quadripedal (crawling, bottom shuffling))

Bipedal. (Cruising, walking)

GAIT: (to b examined without aids or orthosis)

1. Stability in stance phase
2. Clearance in swing
3. Preposition of foot before heel strike
   (The above three functions are required for stability)
4. Step length (velocity)
5. Energy expenditure (for planning nutrition and functional activities)

   Functional Scales:

   (Use the APPENDIX Chapter to get relevant scales and information.)

FORM 3: QUICK SPECIFIC PHYSICAL ASSESSMENT FORM

(To be used keeping in mind only 10 minutes of examination allowed)

Specific Examination:

Associated disabilities: Vision, Hearing, speech, Intellectual (use the appendix for specific impairment assessment)

Neurological Status: (determine tone, strength, type of movements,)

Passive range of motion to look for contractures, Deformities and Dislocation:

Hips: Adduction, Internal Rotation, Gracilis tests, Thomas test, and other standard tests appropriate to the patient.

Knees: Popliteal angle: R L

Ankle and Foot: Equinus, calcaneus foot, valgus deformity and varus deformity.

Elbow: flexion, forearm supination, pronation, wrist, fingers and thumb in palm contracture

Spinal segments: scoliosis, kypho scoliosis,

POSTURE:

TYPE OF MOBILITY:

GAIT:

FORM 4 : COMMON FOR DECISION MAKING AS PER DETAILS OBTAINED FROM FORM 2 AND 3

Working Diagnosis:

(*Tick the appropriate finding)*

- Patho-physiology:(Premature, multiple pregnancy, asphyxia, post maturity, low birth weight, genetic, developmental delay, unknown)

- Neurological :(Spastic, Athetoid, Dystonic, Hypotonic, Variable, Mixed, Ataxic)

- Demography :(Hemiplegia, monoplegia,diplegia, quadriplegia ,total body involvement)

- Mental Function: (educable, trainable, and custodial)

- Associated disabilities: Vision, Hearing, Speech, Intellectual (Mild/ Moderate/ severe/Profound)

- Severity: (mild, moderate, severe, custodial, profound)

- Relevant investigations:

Remarks:

SECTION 2: MANAGEMNT APPROACHES:

PHYSIATRIST'S APPAROACH

1. Identify the Pathophysiology and impairment (Location of lesion in brain and the resulting impairment like spasticity, contractures, communication, cognition etc)
2. Identify the disabling factors (communication, sitting balance, ADL, mobility, vocational educational and vocational activities.)
3. Identify his/her role or position in society,:
   (Pre school, school going, college, higher education, unemployed, employed, home bound etc)
4. Attitude of the society towards the child :(attitude of caretakers at home, in school and society, financial considerations etc)

Management goals:

1. Children up to 3 years to be managed intensively towards reducing the impact of pathology and improving the potential of the child.
2. 3 – 6 years ideal time for nonsurgical interventions aiming to prevent and tackle complications.
3. Above 6 yrs to aim for getting educational activities, sports activities, group therapy and strength training etc.
4. Adolescents and adults to manage the specific problems like pain, stiffness, contractures, nutrition and to achieve independence, including advanced interventions like surgery etc.

Goals:

Short term goal :(use of different therapy procedures, medications, etc)

Intermediate goal: (interventions, appliances, mobility aids etc)

Long Term goal: (predict what will be the future of the patient after certain time period and improving his/her functional abilities accordingly)

REMARKS

Date, Name and Signature of Doctor:

4. MANAGEMNT STRATEGIES:

A. REHABILITTION THERAPY SERVICES:

1. Principles for prescribing Rehabilitation therapy services after Telemedicine / short physical consultation:

After completion of clinical examination and establishing a working diagnosis, following steps are to be followed.

- **The basic foundations of function on humans depend on the following:**
  - Program generator and coordinator – Brain
  - Sensory input from outside world and inside the body
  - Structural integrity of muscles, tendons, connective tissues, bones and joints
- **The following steps will help to make rehab management plans faster:**
  - Where is the lesion (location in brain)?
  - Why is the lesion (aetiology)?
  - What is affected because of it (tone, strength, movements, and physical, mental milestones?
  - What is the impact due to the lesion (primary and secondary functional decline)?
  - What to do (treatment)?

- **Ascertain the neurological status of the child (neurological maturation status)**

- Apedal stage: The child is unable to gain antigravity position, cannot roll and has only phasic movements (flexion, extension only, no rotations) Spinal and Brain stem level.
- Quadripedal Stage: The child can attain crawling, sitting, bottom shuffling will have phasic and tonic movements (in postural muscles to maintain posture against gravity) Child will show righting reactions, meaning Midbrain development level.
- Bipedal stage: The child will be able to extend the neck and trunk independently and show cortical balancing reaction. He/she will be able to stand with support and walk with support, use upper limbs for functional activities.

Once the demography is determined like diplegia, hemiplegia, quadriplegia total body involved (athetoid, dystonia, hypotonia will all be included in the group) identify the potential of the child, what the child can do functionally and try to increase it.

Identify the loss of function in the child and use strategies to minimise and compensate from outside.

General Strategies in Prescribing Therapy Procedures:

(These are principles of management can be taught to caregivers, prescribed to rehab team and periodical reviews of the child)

1. Neck, Gaze and Visual alignment (All these three will help to initiate active movements in neck, influence tone, cognitive processing and guiding physical activity)
2. Rotations of trunk (very important to roll and come to upright position. Gives good proprioceptive input to stimulate postural muscles)

3. Reduce excessive co contraction (to initiate a voluntary movement by teaching reciprocal movements)
4. Strengthen the abdominals to reduce the spasticity in limb muscles and serratus anterior for upper limb spasticity.
5. Introduce gentle proprioceptive and vestibular stimulation to integrate the persistent primitive reflexes.
6. Use repeated sensory modalities both external stimuli (like light, voice, music , gestures) to initiate purposeful movements. Internal stimuli (joint sense, position sense, and alignment, vestibular sensations to initiate and improve postural control)
7. Achieve good base of support with lower trunk extended (so hand will be free for exploring)
8. Maintain feet in neutral position with exercises and splints to help the child to stand with support.
9. Guide the hips reciprocally with rotation of the trunk to same side and later opposite side for body image and proprioceptive input.
10. If the child cries for more than 2 minutes stop the therapy and then proceed.
11. Intensive therapy program up to 3 years of age for maximal benefit with therapy.
12. Weekly thrice for kids form > 3 till 6years (unless interventions are done)
13. School going children during weekends and holidays, to review the functional status and follow up therapy which should be aim oriented.
14. Adolescent children to be treated for fitness, with sport activities, pain, and addressing any local issues (like stiffness, contractures, and deformities)

15. If serial casting is to be done, it needs to be change on every 7th day.

- **Specific Issues:**

- **<u>Quadriplegic type:</u>**
  1. Increase the base of support while sitting.
  2. Work for alignment of head while communicating and feeding.
  3. Increase postural activity with joint compression, alignment, sensory feedback.
  4. Try to gain as much range of motion both passive and active.
  5. Always give active and passive movement by rotating the child and the hands should cross midline to stimulate both sides of the brain.
  6. Extension of the dorso-lumbar spine to get lumbar lordosis which will make the pelvis mobile.
  7. On supported standing either against the wall or in therapy ball place the hips in extension and external rotation.
  8. Use abdominal muscle strengthening to decrease spasticity.
- **<u>Diplegic Type:</u>**
  1. In diplegic children there is disconnect between upper and lower trunk.
  2. The muscles to be strengthened are abdominals, lower fibers of paraspinal muscles and stabilize the lumbar lordosis always while sitting and supported walking.
  3. To work on dissociation of movements to reduce co contraction.
  4. Reciprocal movements with trunk rotation.
  5. All movement training to be associated with trunk rotation to give good proprioceptive feedback.

6. On supported standing ask the child to rotate the trunk to look backwards and give upper limb activities.
7. Use of cane will be better than walker/ crutches to improve the trunk balance while walking and standing.
8. Holding mother/ caregiver hands and ambulating will give good and corrective sensory feedback than walkers and crutches.

- **Hemiplegic Type:**
  1. Cognitive and body image training are important.
  2. Gain symmetry in gaze, face, neck and train upper limb activities in sitting crossing the midline.
  3. Align both lower limbs while standing and keep the hips in extension and external rotation while training to take a step.
  4. Active trunk rotation is very important to dissociate trunk movements.
  5. Move the affected upper limb away from the body by external rotation of the shoulder and rotate the trunk to opposite side.
  6. In standing, guide the affected side to take step and normal side to follow. Keep the hip in external rotation in stance phase of affected side.
- **Athetoid:**
  1. Important to use the eyes to control the posture.
  2. Hold the head and support the arms while weight bearing in sitting
  3. Prone lying in the therapy ball and slowly make him vertical.
  4. Ask to do hand activities through using vision.
  5. Feed from the side while stabilising the head in midline.
  6. Give something to chew to regularise lip movements.
  7. Guide to avoid nonfunctional movements.

8. Align the shoulder, rotate the trunk and ask to flex and extend the spine.
9. Align the hips, knees and feet while supported standing and give downward vertical pressure to improve proprioception in lower limbs, the athetoid movements will immediately reduce.

- **Ataxic type:**
  1. Align the head neck and eyes.
  2. Use weighted cuffs to wrists to train upper limb activities.
  3. Use weighted cuffs in LL to improve activities.
  4. Eyes should track the movements to improve visual input to facilitate movements.
- **Hypotonic type:**
  1. They will have problem to stabilize the joints and unable to sustain muscle activity after initiation in contrast to spastic ho have difficulty in starting and unable to end.
  2. Give support to weight bearing joints and tight approximation of joints
  3. Main therapy should be directed to increase proprioceptive input.
  4. Use eyes to follow activities.
  5. Frequent rotation of trunk will be very useful.

5. Speech assessment and recommendations for tele rehabilitation

History

- Speech & Language milestones
- Hearing & Vision
- Mode of Communication: Verbal / Nonverbal / AAC
- Comprehension & Expression
- Feeding & Swallowing
- Cognition

Examination

- Oral Peripheral Mechanism Examination (OPME) – labial, lingual, palate, uvula, buccal, jaw& dentition should be examined (Mouth opening, Tongue movements, ROM, Strength & sensations examined as appropriate)
- Vegetative Skills – Sucking, blowing, biting, chewing, swallowing

Home Management:

(Select the needed instructions from the list below and discuss with the caregivers)

1. Initially work on **Pre linguistic skills** like eye contact, response to sound, attention, imitation (verbal & non-verbal) pointing, sitting tolerance, reciprocal response to name call, play.
2. **Intensive speech stimulation:**

- Talk to your child as you give her a bath, feed her, and get her dressed. Talk about what you are doing and where you are going. Tell her who or what you will see.
- Read to your child. You don't have to read every word, but talk about the pictures. Choose books that are sturdy and have large colourful pictures. Ask your child, "What's this?" and try to get him to point to or name objects.
- Speak clearly to your child. Model good speech.
- Repeat what your child says to show that you understand. Add on to what she says. Use words like, "Want juice? I have juice. I have apple juice. Do you want apple juice?"
- Ask questions that include a choice. "Do you want an apple or an orange?" "Do you want to wear your red shirt or your blue shirt?"
- Teach normal lexical items like body parts, vehicles, animals, fruits using pictures/objects
- Language and Word Association – Using flashcards with different words and sounds written on them; putting together puzzle pieces with words that go together, like “sock” and “shoe,” “toothbrush” and “toothpaste,” and “bat” and “ball.”
- To improve comprehension and expression of Action verbs - Show pictures of action verbs like eating, drinking etc. and explain to her. Then ask the child to select the appropriate pictures (e.g.; show me the picture which shows eating) If the child correctly shows the pictures of action verbs, then ask her to explain the picture (“what’s she doing? She is EATING, say “eating”)
- Activities to improve Simple one step commands - Choose Commands. Pick 3-4 different commands to work on (e.g.: say hello, put your hands over your eyes, give me the book, give me the pen etc.).Start by physical prompting the child. Say, “Do this” and show

your child the motion. Then immediately physically prompt them to do the same movement. Provide praise and reinforcement. Start to fade your physical prompting. See if the child can either initiate or finish the movement on her own. Provide extra reinforcement for any response that is partially independent. Once you have faded prompts and are working on mastering each comment – make sure to handle errors correctly. When the child responds incorrectly, say a simple no and represent the movement. Do not provide reinforcement for errors.

- To improve mean length of utterances- You wait until the child says something on her own, and then you repeat it back to her while adding one word. For example, if the child says "go outside", you would repeat back "I go outside" or "go outside please", or "go play outside". It doesn't matter what you add. In fact, you could say it multiple times and add a different word each time. Just give the child lots of models so that she hears different ways to expand on what she's already saying.
- Teach preferences & negation – YES/NO

3. **Social communication & conversational skills** - joint attention, use of gaze, sharing, play behaviors (solo play, peer play, pretended play), topic management (initiate, maintain, terminate topic), turn taking.

4. **Oro motor exercises** –
    - Oral massage using gloved finger/finger brush and swallowing of the saliva
    - Articulation Therapy – Using language cards to help focus on specific sounds; encouraging children to make sounds while

looking in the mirror to help them understand how their mouth moves.

- Blowing – cheek puffing, bubbles, balloons, blow kisses, whistle
- Lips – puckering – smiling, Big smile and hold, squeezing lips around a lollipop to increase strength, pursing lips to improve lip extension
- Tongue – lateral tongue wags, tongue curls, tongue retraction, tongue-nose-chin, Using a tongue depressor/spoon, press the tip of tongue out against the tongue depressor. Put the tongue depressor on the tip of tongue and push up. Put on the middle of tongue and push up against the roof of mouth. To exercise the back of the tongue, say the"k" sound, then put spoon on the spot of the tongue that made contact with the roof of mouth and push up.
- Jaw - Jaw thrust, Maintaining yawn position, open and close against resistance, eating crunchy foods like carrots.
- Breathing Exercises – Work on inhalation and exhalation.
- Swallowing Exercises – Effortful swallow, Masako manoeuvre (child sticks their tongue out, gently puts pressure on it with their teeth to hold in place and then practices swallowing), Shaker exercises (Isometric& Isokinetic) , Mendelsohn manoeuvre, Supraglottic manoeuvre, Effortful pitch glide (say eee in the lowest pitch possible & raise to highest possible pitch and maintain this tone)

5. ***Non Verbal Child/Low Speech Intelligibility*** *–Gestures/Signs, Picture communication* ,Communication boards using commonest needs and actions , emotions, needs, Communication books, Computers & Software/apps.

<u>Referral to Speech Language pathologist:</u>

1. Audiological Evaluation- For all children with a history of NICU admission > 5 days, Low birth weight, Preterm, or other perinatal complications should have a BERA done by 3 months of age. DPOAE alone is not enough.
2. Speech Language Assessment – Can be assessed as early as 6 months. REELS assess children from birth – 3 years. Usually home programs are advised up to 1- 1.5 years of age and Speech therapy can be started according to the severity of speech impairment.

Scales commonly used by SLP:

a. Birth – 3 years - REELS -Receptive-Expressive Emergent Language-3 (REEL-3), Bzoch, League, et al, 2003
b. Speech intelligibility rating scale (by AYJNISHD)
c. Drooling rating scale (by Thomas – Stonell and Green berg)

Articulation scales according to the language used.

(Refer to the scales used commonly to assess communication management)

6. Assessment and Management for cognitive function

- Can do general age appropriate assessment of knowing shapes colours alphabets objects etc. using flash cards or toys
- If motor function of one or more limbs affected activities can be given to the normal limbs so that it's easier for kid to do and focus on cognitive function
- Attention can be assessed by age appropriate activities like sorting, line cancellation numbering backwards
- Memory can be checked by recall of various objects shown
- Simple puzzle making can be used age appropriately
- What comes next, story finishing, odd man out, find differences between pictures can be used
- Mathematic assessment for identification of numbers simple additions subtractions

A Guide for Parental Education to give Cognitive Therapy:

1. Early intervention is the key. Don't wait till delay is obvious.

2. Developmental milestones to be kept in mind and assessment of the child to know present cognitive development to be known.

3. Adequate repetition of the activities to be given per day. Do not do the same activity over and over to avoid boredom.

4. Use strategies and resources available at home to make them learn. E.g. even a bag of vegetables can teach child concepts of colour, shape, names, sorting, sizes, alphabets etc.

5. Integrate all senses (Vision, auditory, smell, taste and touch) as and when possible while making them learn. E.g. Child learns better when they touch and smell and squash an orange rather than an orange picure in a book.

6. Start with simple objects and personal routines at home. E.g. At the beginning Child should know about basic objects like switch board, TV, fan, chair, photos etc. rather than knowing rockets and jets.

7. Rather than by hearting and learning, try to work on conceptual learning since the start. E.g. the child may be able to name all animals in a book but will not name a dog in real

8. Put extra emphasis on independence of activities of daily living first which can help in a big way to improve cognitive function.

9. If the child has any motor dysfunction, improvise on the activities to accommodate better functioning limbs so that the child can concentrate better on the cognitive aspect.

10. Unregulated screen time to be avoided. Many video based apps and games are available which can help in improving memory, attention span, logic, etc. which can be given to the child with adult supervision and interaction

11. Children should be allowed to do unrestricted but supervised explorations for them to learn from nature and environment.

12. Some attention tasks. e.g. : Finding same coloured objects in room, sorting of vegetables, building blocks, stacking finding the differences and so on

13. Some memory tasks. E.g. recall of any animal or objects shown earlier, memory games

14. Executive functions activities like shadow matching, what comes next, puzzles, maze drawing etc.

15. Fine hand function activities like beading, clay activities can also help.

16. Initiate and encourage role play and imitation activities.

17. Assess the child's area of interest to introduce concepts using those objects rather than with objects which child is not interested. E.g. a child who is interested in cars can be taught colours n shapes available in cars rather than from a book which he is not interested.

7. Botulinum Toxin -A intervention

1. **Pre School Group. Age of 3- 6 years**

a. Child is bedridden:

- Severe adductor spasm interfering with perineal hygiene.
- Spasm in the night producing pain and disturbing sleep.
- Severe dystonic movement injuring face, eyes etc.
- Bedsore or pressure injury over the sacral area remaining unhealed because of the spastic posturing of the lower limbs

b. Child can sit, crawling and walking with or without support:

- Hip migration is more impending dislocation of hips.
- Extreme flexion in knees unable to make him sit in chair.
- Marked scissoring in hips, to enable to fix splints, orthosis etc.

2. **School going children: After 6 years.**

a. Wheel chair dependent:

- For proper sitting in wheel chair and aid transfer (extreme flexion in knees get stuck with the wheel chair seat)
- Severe elbow and wrist flexion interfering with skill learning in school
- Spasticity induced posturing leading to pressure injury

b. Hemiplegics and diplegics:

- Elbow flexor spasticity with contracture setting in, Botulinum Toxin A will help to prevent contracture and cosmetic appearance in grown

up kids.

- Long wrist flexors and finger flexors: after assessing for proper hand grip
- In lower limb, careful examination is required since child would have already developed a normal side body image so the effect is guarded. For improving gait and functional activities; thorough clinical exam is required. It is difficult to decide Botulinum Toxin A treatment plan on tele and or video consultation.
- Hip flexors: Do Thomas test , rule out contracture; try with correction of alignment first
- Hip adductors: For scissoring gait, after correction of trunk alignment
- Hamstrings: please ensure that it is not joint stiffness/ contracture and actual spasticity (exaggerated stretch reflex/ resistance in the middle range of the movement)
- Rectus: Duncan Ely test; assess the contribution of the spasticity in making the child stand
- Gastrosoleus: Do Silverskioldt test and assess the exact muscle to be injected; rule out whether the plantar flexion is a compensatory measure for weak Quadriceps or tight hip flexors
- Tibialis posterior: If ankle is staying in inversion; even after casting
- FDL and FHL: Clawing of toes
- If there is persistent drooling, Botulinum Toxin A can be given in parotid and submandibular glands to reduce drooling of saliva and for cosmetic reasons especially during social gatherings like birthday, weddings etc.

8. Orthosis

Role of orthotics

- To correct and/or prevent deformity
- To provide a base of support
- To facilitate training in skills
- To improve the efficiency of gait

A. Pre school

1. Look for base of support in sitting, symmetry of hips, foot are plantigrade in supported sitting and standing.
2. Orthotics like soft wedges for adductor spasm & Sleeping soft mat with Straps to be fixed to control & maintain the extremities if they have spasticity.
3. Corner seat with adductor wedges for sitting training.
4. If there is neck control, wooden chair with back support, hip wedges, knee straps and foot rest at maximum dorsiflexion possible.
5. Soft AFO to apply when the child is being carried.
6. Look for Elbow in flexion position preventing reach
7. Soft gaiters to elbows to facilitate shoulder movements.
8. Look for thumb in palm position.
9. Simple thumb spica to keep the thumb in adduction and extension to leave as much palm area free for sensory input.

School Going

Look for flexion and adduction in hips, hamstring tightness, equinus, in lower limbs and for flexion in elbow wrist and fingers.

The decision to prescribing orthosis depends on the functional activity of the child in school. It should not restrict and interfere with learning and play activities.

Athetoid Type CP:

Upper limbs no splints only taping. Lower limbs soft AFO to keep the feet in plantigrade position.

Diplegia:

Functional splinting for upper limbs

Functional braces for lower limbs to gain mobility (like AFO with ankle joint, dynamic AFO for valgus feet, soft KAFO for knee support, floor reaction orthosis for crouching etc.

Quadriplegia:

Upper limbs: Under arm Crutches. If there is spinal curvature then elbow crutches to facilitate extension for trunk and standing, Thumb spica in day time and cock up splint in resting period for the hands

Lower Limbs: Hard KAFO for standing training, AFO while sitting in chair / wheelchair, Walkers for gait training, Night splints for one hour in the beginning and one hour before getting up. Any new orthosis should be worn for 10 minutes daily in first week and then gradually increase for better compliance.

Spinal Orthosis:

Spinal curvatures in CP are mostly C types . Use Thoraco Lumbar Spinal Orthosis with front opening to be worn during sitting only.

Spinal curvatures associated with hip and pelvic obliquity need to treated as whole before bracing

Adolescent Stage:

Splints should be light and less expensive since rapid growth needs frequent changes.

9. Medications

As per GOI Guidelines only OTC medications and other drugs in O, A and B list (As per Annexure 1 of GOI Guidelines for telemedicine) may be prescribed via telemedicine. For other drugs a physical consult is essential.

Important guidelines regarding drug prescription in Cerebral Palsy:

A. Drug treatment of spasticity should not be based on tone assessment only; functional gains or goals are important determinant for starting anti spasticity treatment.

B. Some patients may experience a decline in function with spasticity reduction if started on anti-spasticity medications without due considerations to functional status advantage gained with spasticity.

C. Do not stop any drugs patient is taking abruptly, always take prior drug intake history and accordingly wean off the drugs if needed

D. Drugs take 3-4 weeks to have an effect and hence any titration should be done after 1 month. If the patients are stabilized on a dose then 6 monthly follow-up is adequate.

E. Refer to standard information for drug dosage and mechanism of action, Complications, its prevention and management and do monitoring of blood biochemistry (liver and kidney function tests) 6 monthly.

Important drugs to be consider (to be prescribed as per standard Dosage)

1. Baclofen – start with 5-10 mg TDS and titrate after monthly interval for best results. Monitor liver and kidney function. Not to be used in child with seizure disorder

2. Tizanidine – Start with 2 mg TDS and titrate to the desired dose

3. Diazepam – start with low doses and at night, useful for patients with seizure disorders and hyperactivity .It is effective for the short-term treatment of spasticity in children with CP.

Ataxia and drowsiness are important side-effect affecting rehabilitation.

4. Sodium valproate, carbamazepine and gabapentin – drug of choice in CP associated with seizures or dyskinetic CP

5. Trihexyphenydyl (anticholinergics) – Useful to some extent for drooling and dystonia.

Conflicting evidence. Side effects are usually reversible (dry mouth, constipation, urinary retention)

6. L Dopa and Carbidopa – conflicting evidence, very useful in Dopa responsive Dystonic Cerebral palsy (In absence of specific tests a test trial may be considered

7. Glycopyrrolate – Can be used for severe drooling, short term management

8. Scopolamine patch - may be used for drooling for short term.

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APPENDIX

Scales that can be used:

1. Modified Ashworth scale for spasticity.

2. WEE FIM for Paediatric Functional assessment scale

3. Gross Motor Functional Classification System (GMFCS)

4. Manual Ability Classification System (MACS)

5. Receptive- Expressive Emergent Language Test. (REEL- 4)

6. Cognitive Assessment (By Clinical Psychologist):

When formal evaluation and documentation of IQ and/or SQ is needed, refer to a psychologist.

Tools which can be used for assessment:

- Formal assessment tools for IQ and SQ
- Vineland Social Maturity (VSMS) Scale- 1 year and above
- Binet Kamat Test (BKT)- 3 years- 22 years
- Seguin Form Board Test (SFBT) – 4 years above
- if suspecting attention deficit or hyperactivity, Vanderbilt ADHD Diagnostic Parent Rating Scale (VADPRS) from 7yrs
- If suspecting Autism- Childhood Autism Rating Scale 2 (CARS 2)

FOR OTHER SCALES PLEASE REFER TO (*IAPMR GUIDELINES TO MANAGE A CHILD/ADULT WITH CEREBRAL PALSY 2017)* in IAPMR website