

Special Article – Chronic Pain Rehabilitation

Adolescent Return to Ambulation: A Flow Chart for Multidisciplinary Staff Education

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USA**Received:** March 10, 2016; **Accepted:** April 14, 2016;**Published:** April 18, 2016**Abstract**

The purpose of this article is to discuss and explain the concept of creating a "flow chart" for multidisciplinary staff education. It can be a useful tool for new staff, and to help current staff, gain a better insight to the thought process of a therapist that may be working on return to ambulation and weaning of assistive equipment. The rational and importance of different assessment areas, use of coping skills, and the challenges you may encounter are discussed. Although this tool was created for our specific team, a similar item, along with desired edits, may be helpful for other multidisciplinary teams to utilize for improved consistency with patient and family education and care.

Keywords: Chronic Pain Rehabilitation; Adolescents; Complex Regional Pain Syndrome; Functional Mobility

Introduction

Return to ambulation with a diagnosis of complex regional pain syndrome (CRPS) is very important to ensure the pain process does not permanently inhibit function and mobility. At times it may be challenging as a practitioner to decide when, how, or if you should attempt to remove assistive equipment; especially when other factors such as fear and anxiety about weight bearing are in the mix. There is limited research in this area that provides guidelines and chronic pain itself is challenging to treat because it can be so diverse in presentation, prognosis, and ad acceptance. We decided to review and document how our specific program decides what approach to take so that other non-therapy disciplines (such as psychology, nursing, schoolteacher, etc) and new physical and occupational therapists would have a better understanding and be able to consistently educate adolescents and their families. As we created the primary draft of a flow chart, we took into account strategies that have not worked well consistently and ensured the focus was on long term, not just short term, and functional mobility. This article focuses primarily on lower extremity CRPS however similar concepts may be applied to those with upper extremity CRPS or even more psychological diagnoses such as somatoform pain disorders where adolescents are using equipment for functional mobility.

Assessment

First, one should assess the extent of limited mobility, specifically weight bearing status. This includes non-weight bearing, partially weight bearing (i.e weight bearing only through hind foot or forefoot, excessive inversion or eversion, etc.), or full weight bearing with compensatory strategies (use of odd movement patterns through trunk or lower extremity) which is causing asymmetric gait. It is important to look at how much time they have been presenting like this, i.e how long have they been using these movement patterns or assistive devices, how long have they demonstrated poor positioning and posturing, etc. This will affect their functional ability to achieve proper gait depending on level of weakness, deconditioning, slowed balance reactions, bone density, and range of motion through

necessary joints. If contractures or osteopenia are involved, making sure that a doctor has evaluated this adolescent is necessary, and a gradual approach is necessary.

Through experience, we have found that most adolescents that have had CRPS for less than 6 months typically can transition to weight bearing in therapy sessions with less manual and therapeutic techniques due to having fewer limitations in strength and range of motion. If they have experienced this diagnosis for over 6 months this is when a more gradual, cautious method of treatment may be essential. During treatment, attention to any new, acute pain that occurs in their effected extremity or other areas is important to assess, however increased pain from CRPS is expected especially with initiation of weight bearing and physical activity. In order to initiate gait training an adolescent should have appropriate anti-gravity and gravity resisted strength and muscle endurance (the ability to complete a movement repeatedly before fatiguing). Additionally, the adolescent should demonstrate appropriate passive and active range of motion in order to successfully initiate ambulation and gait training. If adolescents do not have appropriate strength, endurance, or appropriate range then this is the first area providers should focus on prior to initiating ambulation. This specifically is an area that other providers often do not understand why they cannot see improvements in functional mobility as quickly as in other cases with similar diagnoses, and further explanation about need to work on more basic activities before initiating gait can be helpful (Figure 1.1).

Although it is important to formally assess pain in therapies, it is essential that this is not the area of focus and should not be the primary predictor of success with specific activities or ability to progress mobility. It is beneficial to observe pain behaviors (such as the "UAB Pain Behavior Scale") and functional presentation instead of using a more typical method of assessment such as the visual analogue scale.

Treatment and Education

In attempts to assess strength and range of motion, if typical

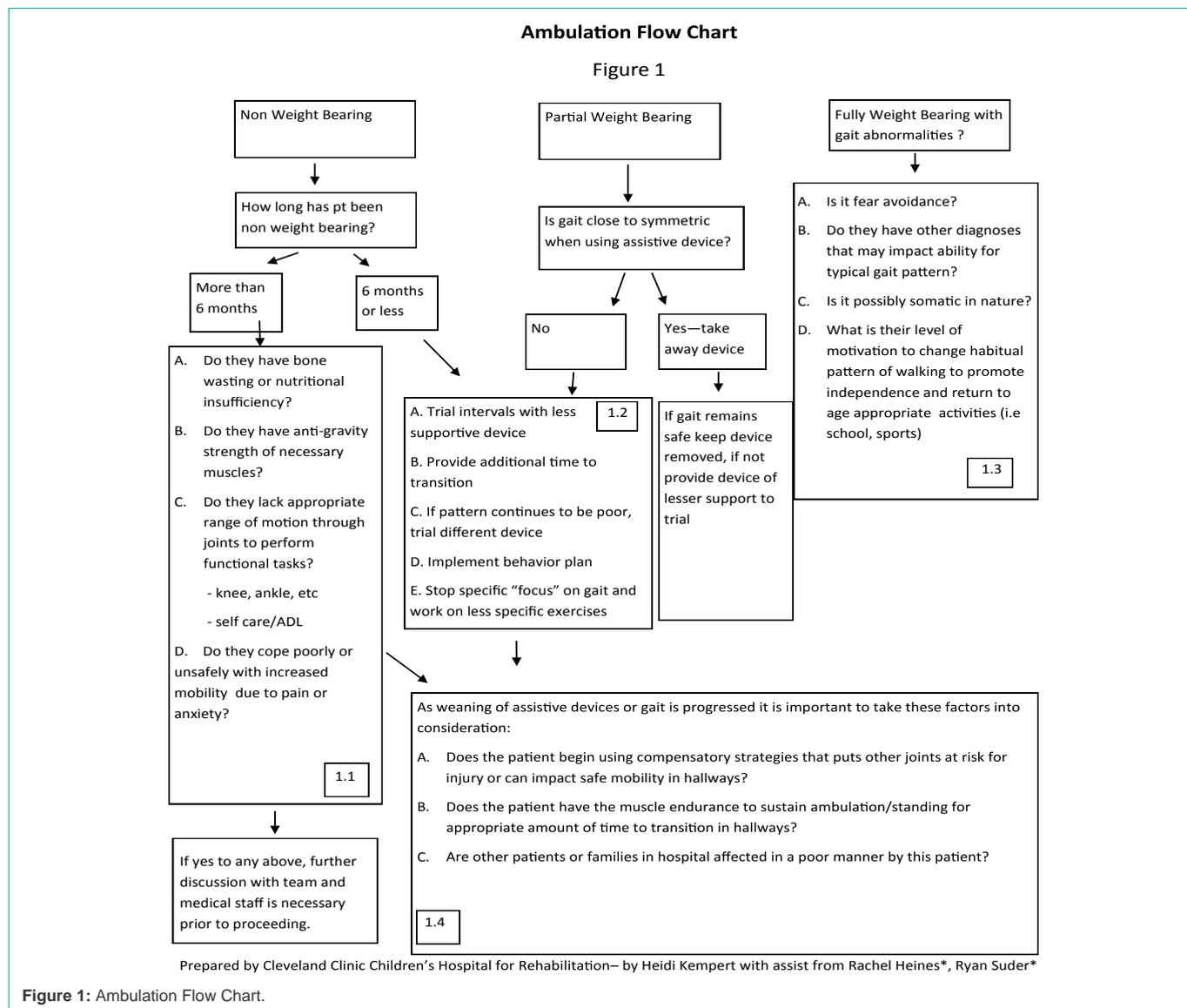


Figure 1: Ambulation Flow Chart.

manual muscle testing is limited by allodynia or muscle guarding, success has been noted while incorporating developmental play activities such as the therapeutic swings, prone scooters, various transitions to participate in preferred activity, and adaptive tricycles to name a few. With these activities, you can assess some strength or active range of motion while they get in or out of positions as well as during the activity. Finding preferred activities that the participants are motivated by is helpful as they will most likely be experiencing pain with activity and can quickly lose motivation if they do not see the purpose or outcome from certain tasks. It is often helpful to complete manual stretches, apply kinesiology taping, or use overnight splinting to facilitate more rapid passive range of motion and ability to bare weight however since most adolescents with this diagnosis have some level of guarding and/or allodynia so many times these therapeutic techniques cannot be utilized initially. In addition, focusing on motor control, eccentric strength, balance training, body awareness, proprioceptive input, and sensory activities may help improve movement patterns.

Education to the adolescent, about what you are going to do manually, what you are going to have them do, and why certain activities are important, may be helpful to decrease their anxiety and fear of both weight bearing and movement. Discussing with parents about treatment strategies and plans is also helpful so they can support the adolescents in their down time.

Implementing Coping Skills

Another thing to take into consideration is the adolescent's knowledge about and/or ability to use coping skills (such as even breathing, distraction, imagery, etc) with ambulation activities. Coping and relaxation strategies to help maintain physical activity despite pain are also vital as each step in weaning of assistive devices will most likely be more painful initially; having the adolescent work with a knowledgeable therapist or psychologist so that skills can be used during physical activities will help promote success. If the adolescent has learned skills but is unable to apply them during challenging activities then progressing weight bearing may be

very difficult and functional success is considerably less common. Ability to cope with increased pain and stress can also affect safety with ambulation and other higher-level balance activities. As a practitioner, it is recommended that you work within your comfort zone, however attempting to have the adolescent work into slight discomfort, pain, and try new activities may promote faster gains. It has to be a balance, if there is too much pain then they may be unable to cope successfully, which will often interfere with the trust relationship between the adolescent and therapist, and could cause a back slide in progress (Figure 1.1).

Assistive Devices

When discussing return to ambulation there is many different assistive devices that adolescents may be using or that you might be thinking about using. As a clinician, you have a basic knowledge of pros and cons of different devices however this will highlight some things to think about for review. It is also important to educate family member on proper use and reasoning behind assistive equipment for improved follow through when the adolescent is with them outside of therapy sessions.

Bilateral axillary crutches allow for full non weight bearing of a single extremity and require coordination to appropriately use for facilitation of partial weight bearing, it is often observed that younger adolescents are using crutches inappropriately and begin using odd compensatory strategies that may interfere with use of other devices. Additionally, we have found it challenging at times to transition from non-weight bearing to partial weight bearing using the same device within the pediatric setting due to the learned movement patterns from prolonged use. The use of a single axillary crutch will allow for partial weight bearing however, coordination is still a factor and many can look and/or be unsafe with their use of this specific device. The use of a forward walker will help with balance and support to some extent however, the adolescent must have the ability, and motivation, to remain upright through their lower extremities and appropriately hold onto it with both upper extremities for safe use. Reverse walkers are more desirable for those that have less motor control and may be unsafe (especially with somatization disorder that go along with CRPS). In our program we have found that very deconditioned adolescents that were fully non-weight bearing are able to successfully use this device to initiate gait training and work on quicker progression to more independent use of device. Since it provides so much support we attempt to use this style of walker on a temporary basis while working on strength, weight bearing, and balance to advance to a different type of assistive device or even the use of a gait belt. Gait belts can be helpful for balance retraining activities for safety and ability to weight shift to less desired extremity and should be used in place of traditional devices at times (Figure 1.2).

To summarize, there is not one single, ideal assistive device. In our program, we tend to focus on getting rid of their current device and limit switching to another device however this is not always possible. Appropriate use of any of these devices with developing adolescents that have poor motor planning, coordination, and proprioception will most likely lead to compensatory strategies developing. The biggest take away is that getting the adolescent ambulating as soon as possible without an assistive device is key however also understanding how certain assistive devices may offer too much support or allow for

improper weight bearing and movements is important.

No matter what device is being used or trialed it is important to ensure symmetric use of extremities, maintained and adequate range of motion, muscle endurance, and strength; safe use of device, and ability to limit habitual or compensatory strategies as you work on weaning devices. The use of an assistive device should be to gradually promote improve gait and weight bearing, and promote confidence and independence for the adolescents. At times you will find that due to fear avoidance, or maybe even lack of motivation, the adolescent will not allow for proper weight bearing when using any assistive device, this is when you may need to transition to ambulation with use of a gait belt and no external support. The primary goal is to increased functional mobility while ensuring joint safety and improved body mechanics with a gradual approach.

Other Challenges

When weaning or transitioning to alternate assistive devices additional time for ambulation is typically needed initially. In many setting slowed transitions can be challenging to allow for while avoiding other patient care to be completed uninterrupted. Additional support staff can be useful to help implement use of new devices but also may limit options. Behavior plans can be helpful to promote more consistent or proper use of devices however implementing plans without additional support (from family or other staff) can pose a challenge. It has been most challenging at times to address ambulation in adolescents who are full weight bearing without assistive devices and demonstrate habitual compensatory strategies. Since they are full weight bearing they are often rather functional and may lack motivation. If motivation is being questioned, it can be beneficial to take specific focus off “gait training” and work on other closed and open chain strengthening tasks that the adolescent might be able to complete more willingly (Figure 1.2).

- In the flow chart other factors are identified that may be influencing progress, causing plateau, or might affect progress in the future. This includes: (Figure 1.3): Other neurologic diagnosis that may impair ability to achieve typical gait (such as mild cerebral palsy)
- Motivation to change habits and/or gait to improve functional mobility (i.e if a patient could do all desired tasks despite odd mobility patterns then the motivation to work on improved or different movements might not be present)
- Identifying if there is a secondary gain with decreased mobility such as not being able to return to sports, return to school, help with chores or other household responsibilities, spend time with peers, etc.
- Safe ability to use device(s): (Figure 1.4):
 - o Do they have strength and endurance appropriate for amount of time or distance required?
 - o Are they using device in unsafe manner when around family vs staff?
 - o Are other employees, patients, or family members affected by the patient’s use of a specific device? (i.e does the adolescent demonstrate increased pain behaviors that are counterproductive and concerning to others while using a specific device but not with another?)

If you identify any of these you may want to speak with this adolescents psychologist, or if they are not seeing one, you may want to recommend they do to facilitate progress in your treatment sessions.

Conclusion

The first draft of our ambulation flow chart can be found as Figure 1 for reference with above discussion. Although many practitioners might vary in their options about progression of gait and weaning of assistive devices from that listed and discussed, it was helpful for other team members to gain understanding of a therapists thought process and decision-making. A flow chart or other similar items may be useful tools to implement for use in other setting with any edits or additions you may prefer to make.

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