An Assistive Device for Toddlers Ambulating With an Intravenous Pole

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A prolonged hospital stay for neonates can create problems associated with parent–infant bonding, environmental deprivation, and other psychosocial problems between the infant and family (Behrman & Vaughan, 1983). When family illnesses or psychosocial difficulties interfere with parental involvement with the infant, further delay of the infant's physical developmental skills can occur. In these cases, the acquisition of developmental skills depends upon the hospital staff, who must provide both the environment and the therapy that will enable the infant to master the skills (Bergen, 1974).

This paper describes an assistive device that permitted an infant who lived the first 14 months of his life in an intensive care nursery (ICN) to be ambulatory. The device was affixed to the intravenous (IV) tube pole to which the infant was tethered by a nasogastric feeding line.

The infant was born with multiple gastrointestinal (GI) problems that required the removal of large portions of the intestinal tract. The result was a GI system that was inadequate for normal food ingestion and absorption. He therefore required continuous feeding by nasogastric tube and continued residence in the ICN. Since his central nervous system and musculoskeletal system had no apparent abnormality, motor developmental milestones were age appropriate. As he reached the age for crawling, prewalking, and ambulation skills, the limitations of the ICN became apparent. There was no appropriate space to work on mobility, and parental and staff time was inadequate for the supervision of his independent ambulatory skill development. Moreover, his crawling had been restricted to the area inside his crib to avoid his contracting a nosocomial infection or interrupting the flow of normal ICN activity. At the age of 11 months, when he began cruising in his crib, prewalking skill training was initiated with the adaptive device pictured. When he was discharged at 14 months of age, the infant had normal locomotor, gross motor, and fine motor skills for his age.

Fabrication

The following equipment is needed: IV pole (with wheels), thermoplastic material, scissors, heat gun, heated water for softening the thermoplastic material, measuring tape, sandbags or weights.

To construct the center support piece (see Figure 1), cut one piece of thermoplastic material 10 cm wide and 20 cm longer than the distance from the IV pole's center to the distal end of the pole's leg. Referring to Figure 1, cut a 7.5 cm slit at the top end of the support piece. This creates two 5 cm tabs for attachment to the IV pole. Then cut two slits at the bottom end of the support piece, each 7.5 cm long and 2 cm...

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from each side. These three tabs will attach to the handle.

Soften and mold (by rolling) the center support piece into a long tube, and mold the top end tabs around the stem of the IV pole (see Figure 2).

To construct the handle piece, measure the distance from the infant’s shoulder to the ground, multiply by 2 and add the width of the torso from shoulder to shoulder. Cut a piece of thermoplastic material 10 cm wide to the length calculated above. Cut 7.4 cm slits in both ends. The resulting 5 cm tabs will wrap around the IV pole legs.

Soften and roll the handle piece into a long tubular shape, and then bend it into a U shape (see Figure 3). (The circumference of the tube must be large enough for the infant to grip, but not so large that the grasp is insecure.)

To assemble, attach the center support piece to the IV pole, wrapping the proximal tabs securely. Attach the handle piece to the legs of the IV pole in similar fashion. Soften and mold the distal portion of the center support piece to the handle, molding to secure firmly (see Figure 3). Wrap adhesive tape around all the joints for extra stability. Finish and smooth the edges with a heat gun.

Discussion

This assistive device can also be used with other pediatric patients who are at an appropriate level of development (generally at an age ranging from 8 months to 3 years [Caplan, 1973]), able to benefit from or in need of ambulatory therapy, tethered to an IV pole, and expected to be hospitalized for more than 5 days.

The base of the IV pole must be sufficiently weighted to control the infant’s forward progression when prewalking activity is being initiated. As the infant’s skill increases, the weight can be decreased and eventually eliminated. Young infants may also need standby assistance to prevent them from inadvertently running into staff, other patients, or hospital equipment. Increased mobility, which permits both more time outside the crib and partial control over the environment, provides psychological benefits for the infant (Brazelton, 1974) in addition to allowing the infant to acquire physical and developmental skills.

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References


