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Adaptive Seating in Pediatrics

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Adaptive seating represents one of the most complex areas of orthotic management. No other area of clinical practice requires the degree of knowledge and application of biomechanics, design engineering, tissue physiology, wheelchair design and the clinical manifestation of the many neuromuscular disorders involved. No other area of management effects as many aspects of the patient's life and treatment programs initiated by other professionals. Therefore, it is imperative to solicit input from all members of the multidisciplinary team (Figure 1). The orthotist, physician, physical therapist, occupational therapist, educator, speech pathologist, social worker, psychologist, and wheelchair vendor must all take part in the prescription formulation (Figure 2). Unfortunately, formal training for the aforementioned professionals provides very little, if any, information for the evaluation, assessment, and design of adaptive seating systems.

Figure 1. Input from all members of the rehabilitation team is solicited.

Figure 2.

DEVELOPMENT

To compound the difficulty of equipment provision, pediatrics offers additional complications that aren't as prevalent in management of the adult population. Because the child is still undergoing physical development and maturation, the clinical picture he/she presents is expected to change. Some of the changes are due to growth (longitudinal and/or circumferential) yet some are due to disease progression, developmental abnormalities, and psycho-social problems that result from an increasing awareness of the physically handicapping condition.

The adaptive seating system must be able to accommodate growth, environmental, and clinical changes in the child. This is particularly important in view of the funding restrictions on equipment replacement set by state or private payment sources.

EDUCATION

Another very important consideration in positioning a child is the child's educational goals and limitations. Aside from the physical barriers that a school may present, safe transportation to and from the school in a bus or van must be achieved. Few wheelchair bases are compatible with the lock down mechanism used by local transportation systems. This basic mechanical problem can hamper the educational process even before it begins.

Once the child is in the school environment, many subtle factors can influence the success and acceptance of the adaptive seating system. These factors include whether or not the child is mainstreamed or in a special education program; the physical design of the school such as elevators for multilevel institutions and overall wheelchair accessibility; whether the communication needs of the child are met in a group setting; desk height, which can profoundly effect actual integration; whether medical/nursing facilities are available; and the kinds of recreational provisions offered for physical education.

INFORMATION COLLECTION

Because the breadth of information concerning the patient can be extensive, there must be a mechanism to facilitate the collection of this critical data. It is imperative that the primary treating professionals provide this input, because of familiarity with the patient and preestablished goals.

The following *In-take* form was developed by author Susan Lin, O.T.R. in an effort to provide a concise patient data collection sheet. While the completion of this form can be time consuming, we have found that access to this information is essential (Figures 3, 4, 5, and 6).

ONE APPROACH TO ADAPTIVE EQUIPMENT PROVISION

In 1981, Newington Children's Hospital initiated its first formal Adaptive Equipment Clinic. The clinic is covered by seven members of the core team with three others forming the ancillary team. The core consists of a physician, orthotist, seating specialist, physical therapist, occupational therapist (who serves a dual function as the Adaptive Equipment Coordinator), speech pathologist, and social worker. The ancillary team is comprised of an educator, psychologist, and durable medical equipment vendor.

The clinic is held one morning per week, divided into four one-hour appointments. Every third week of each month is reserved for a recheck clinic and follow-up care is provided every six months. The follow-up appointments are one half hour long, with eight patients checked in a morning.

CLINIC DATE: _____

APPOINTMENT TIME: _____

ADAPTIVE EQUIPMENT INTAKE FORM

Please complete form and return to:

Date: _____

Individual Completing Form: _____

Relationship to Patient: _____

Patient's Name: _____ Sex _____ SS# _____

Patient's Address: _____ B.D. _____

_____ Age: _____

Parent's Name: _____ Home Phone _____

Parent's Address: _____ Work Phone _____

Language Spoken: Primary _____ Secondary _____

Interpreter Needed: Yes _____ No _____

Referral Source: _____

Reason For Referral: (state problem) _____

Funding Source:

Private Insurance Company: _____ Group #: _____ Individual #: _____

Title XIX #: _____

Other (please specify): _____

I. Medical History:

A. Diagnosis/Onset: _____

B. Orthopaedist: _____

C. Date Last Seen at Clinic or by Orthopaedist: _____

D. Pertinent History: _____

E. Medications: _____

F. Visual Acuity: _____ G. Hearing Acuity: _____

H. Conditions Which Affect the Patient: (please check)

_____ Vascular Problems/Edema
_____ Incontinence
_____ Respiratory Problem
_____ Skin Condition/Sensitivity
_____ Other: _____

_____ Seizure Disorder
_____ *mild*
_____ *controlled with medications*
_____ *severe*

I. Surgery Performed to Date: _____

_____

J. Further Surgical Intervention Planned: _____

_____

K. Skeletal Deformities:

Spine:

_____ Scoliosis _____ Kyphosis _____ Lordosis

_____ *fixed*
_____ *functional*
_____ *spine fused*
_____ *mild*
_____ *severe*

Pelvis:

_____ Hips Subluxed _____ Hips Dislocated _____ Pelvic Obliquity

L. Orthoses:

	YES	NO
Body Jacket (TCO)	_____	_____
TLSHO	_____	_____
Hip Abduction	_____	_____
HKAFO-Hip Knee Ankle Foot Orthoses	_____	_____
KAFO-Knee Ankle Foot Orthoses	_____	_____
AFO-Ankle Foot Orthoses	_____	_____

II. Physical Abilities:

A. Range of Motion: (joint limitations only)

1. Neck: _____
2. Upper Extremities: _____

   _____
3. Trunk/Pelvis: _____

   _____
4. Lower Extremities: _____

   _____

B. Muscle Tone:

	WNL	Hypertonic	Hypotonic	Athetosis	Ataxia
Head/Neck	_____	_____	_____	_____	_____
Trunk	_____	_____	_____	_____	_____
Upper Extremities	_____	_____	_____	_____	_____
Lower Extremities	_____	_____	_____	_____	_____

Additional Comments: _____

C. Pathological Reflexes as They Influence Positioning and Movement:

_____

_____

_____

III. Gross Motor Development: (please check)

A. Gross Motor Skill	Normal	Fair	Absent
1. Head Control			
a. prone	____	____	____
b. supine	____	____	____
c. sitting	____	____	____
2. Sits			
a. supported	____	____	____
b. unsupported	____	____	____

B. Transfers: (please comment) _____

_____

_____

C. Ambulation Status: (please comment) _____

_____

_____

D. Assistive Devices Used: _____

_____

IV. Fine Motor Skills:

A. Grasps/Releases Objects Volitionally with: ____ (R) hand ____ (L) hand

B. Hand movements uncontrolled/erratic: ____

C. Hand Dominance: left ____ right ____ not established ____

V. Functional Skills:

A. Activity of Daily Living Skills:

1. Feeding: _____
2. Dressing: _____
3. Hygiene: _____

B. Wheelchair Mobility:

1. Propels Manual Wheelchair Independently (Please specify type, i.e. L/R one-arm drive, projections, etc.): _____
2. Operates Motorized Wheelchair (Please specify type of control used): _____

_____

3. Dependent _____

C. Communication (Please check all statements which apply.)

1. Expressive Language:
   - _____ Intelligible Speech
   - _____ Non-speaking
   - _____ Expresses needs, wants by pointing, gesturing, and/or facial body movements.
   - _____ Expresses yes/no consistently and accurately by _____ .
   - _____ Functional expressive language skills.
2. Receptive Language:
   - _____ No apparent comprehension.
   - _____ Comprehends simple sentences.
   - _____ Recognizes pictures and/or objects.
3. Augmentative Communication:
   - _____ Uses sign language.
   - _____ Uses communication board.
   - _____ Uses electronic device; type of system _____ .

VI. Behavior: _____

VII. Educational Program:

Attends School/Program: _____ Teacher: _____

Mainstreamed: Yes _____ No _____

Cognitive Level: _____

VIII. Transportation:

- _____ Type of Car
- _____ Van-Standard
- _____ Van-Adapted for Wheelchairs
- _____ Public Bus

IX. Present Program:

	Therapist	Facility
O.T.	_____	_____
P.T.	_____	_____
Speech	_____	_____

X. Home Environment:

A. _____ Wheelchair Accessible

B. _____ Limited Accessibility (please specify width)
   flight of stairs _____ 2nd floor _____ narrow doorways _____

C. _____ Resides in Institution or Nursing Home

D. Equipment to be Used:
   Home _____ School _____ Work _____ Indoors _____ Outdoors _____

E. Description of Equipment Currently Being Used: _____
   _____
   _____

F. When Was Equipment Provided: _____

G. Who funded current equipment? _____

Prior to the first patient evaluation, the *Intake* forms for all new patients scheduled that day are reviewed and discussed. This enables us to establish a preliminary game plan as well as discuss certain confidential factors that may influence management. Formulation of the actual prescription occurs during the hour appointment, with various tasks assigned to appropriate team members to ensure follow-up of our recommendations.

Over the past five years, the NCH Adaptive Equipment Clinic has provided an ideal forum for patient and equipment evaluation and prescription. The aforementioned protocol evolved slowly and has worked very well considering our resources, patient population, time and cost constraints.

Those factors that have universal application are the need for a multidisciplinary approach, the need for follow-up appointments, and a sound understanding of seating principles.

The recent emphasis on adaptive seating has finally enabled the orthotist to assist in management of the entire spectrum of patients, not just those who are candidates for ambulation. The appropriate seating system can be a therapeutic tool which enhances the quality of life and serves as an adjunct to other rehabilitation efforts.

AUTHORS

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