Clinical Application of Dynamic Theory Concepts According to Tscharnuter Akademie for Movement Organization (TAMO) Therapy

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**Purpose:** The purpose of this article is to describe the relationship between specific concepts of dynamic theories and specific Tscharnuter Akademie for Movement Organization (TAMO) therapy principles.

**Key Points:**
- Theories of dynamic perception, such as functional coupling between organism and environment, active pick-up of task-specific information, functional coupling between perception and action are emphasized. Principles of TAMO examination and treatment apply theoretical concepts of nonlinear, reciprocal interactions between organism and environment, information-based perception and action, internal and external forces acting on the body.
- To determine skill levels, TAMO focuses on self-produced actions, their adaptability to diverse situations, and the active and selective pick-up of task-specific information.
- Without moving the patient, the therapist provides task-specific information and changes the existing force distribution through a gentle, task-specific loading input; thus patients are challenged to actively reorganize to new situations. The variability associated with exploring available movement possibilities teaches patients which perceptual-motor aspects need to be monitored. Subsequently, these rules of coordination can be spontaneously generalized to a variety of similar situations. (*Pediatr Phys Ther* 2002;14:29–37)

**Key words:** perception and action, motor control, movement disorders, movement therapy

**INTRODUCTION**

A published survey of members of the APTA Pediatric Section gave the impetus to describe the clinical application of dynamic theory concepts according to TAMO therapy. The survey provided information on reported educational needs regarding current theories in Movement Science and on possible clinical applications of various theoretical concepts. The survey included 241 respondents; 99.4% indicated a desire for more information about current theories and 99.6% expressed a need for additional information regarding the application of current theories to therapeutic principles. Although continuing education courses were given first preference to acquire this information, a large percentage of respondents (66.3%) reported that they selected articles in *Pediatric Physical Therapy* to gain more knowledge of theories of motor control, motor development, and motor learning.

By their response, therapists in the survey confirmed the importance of theories of motor control for therapy. Theories are used by clinicians to explain why a specific treatment principle is applicable to an existing problem and under which circumstances the same treatment principle would not work. For a long time, therapists referred mostly to neurophysiological and neuromaturational theories. Historically, changes of motor behavior were linked solely to the neurological maturation of the central nervous system (CNS) and conversely, motor behavior was seen to reflect the maturational level of the CNS. A hierarchical structure of the CNS was assumed. Consequently, the explanation for primitive or abnormal movements was that...
higher-level brain centers were not controlling the dominating influence of more primitive CNS structures. A hierarchical structure also implies that the development of motor skills and the recovery after a CNS insult occur in a predetermined sequence of developmental milestones and their underlying movement patterns. This information led therapists to focus primarily on specific or standardized motor patterns and on the sequencing of their appearance. Properly applied specific sensory stimuli were used to reorganize motor output and to affect CNS structures. Techniques to inhibit abnormal movements and to facilitate normal movements were applied in treatment. Specific sensory stimuli were also used to normalize tonus. The assumption was that normal tonus would result in normal movements. In time, therapists noticed that the movement patterns that were facilitated during treatment were not applied in self-generated functional activities. In addition, many theoretical concepts underlying traditional therapy principles were put into question by newer insights in neurophysiology and in the movement sciences. Consequently, many therapists started to modify their therapy techniques to achieve better results.

The drastic changes in theoretical thinking challenge clinicians to find useful clinical applications of current theoretical concepts. It seems very difficult—if not impossible—to attach new theories to therapy principles that arose from very different theoretical concepts. Dynamic theories present concepts that have proven very useful to the clinical work of this author. Dynamic theories acknowledge that biological systems are complex, and that many components of the organism, environment, and task interact to produce motor behavior. Biological systems are also seen as nonlinear; a minor change in initial conditions may lead to a significant, abrupt change of behavior. Timing and form of such changes are not fully predictable due to the complexity of the system. Finally, biological systems constantly interact with the environment creating a state of nonequilibrium, which activates the system. These observations allow the clinician to achieve a system wide reorganization in response to a selective change of important external factors. These concepts are applied in TAMO therapy.

TAMO is a new therapy approach that was developed on the basis of modern theories and on the clinical experiences of this author. After having taught Neuro-Developmental Treatment (NDT) for more than 13 years, the treatment principles of the author were no longer compatible with the fundamental principles of NDT. These new clinical concepts needed to be referred to by a new name. In 1990, TAMO, the abbreviation for Tscharnutter Akademie for Movement Organization, was chosen. Since 1991, TAMO therapy has been taught at various universities in the USA and in continuing education courses throughout this country and abroad. In TAMO, the CNS is no longer seen as the only factor determining motor outcome. Instead, the focus shifts to the interaction between many sub-systems including external factors. Motor control is not linked to specific patterns or movement configurations, but to the ability to work with internal and external forces that act on the body at each moment. The various skill levels of these interactions are continuously explored in TAMO. Stages of skill development focus on aspects that are different from traditional descriptions of sensorimotor development.

Clinical research in using TAMO therapy is in progress. One research project addressed excessive foot pronation in teenagers and adults. Measures of force production during gait, calcaneal angle measurements and arch width measurements showed that all 12 participants improved significantly from pre to post tests after two or three TAMO treatment sessions. Most of the improvements were maintained after one month. Additional clinical research and case studies are certainly needed to gain more insight into the applicability of TAMO therapy.

**PURPOSE**

The purpose of this article is to demonstrate the application of theoretical concepts of dynamic perception to specific TAMO therapy principles. By taking a functional rather than neurophysiological approach to perception, the theory of dynamic perception offers very valuable concepts to clinicians. James Gibson first proposed novel assumptions about perception more than 40 years ago. Gibson offered an ecological perspective to dynamic perception where the function of perception is to link the organism with the environment. The resulting reciprocity between living systems and their environment yields perceptual guidance of actions. Thus, actions spontaneously adapt to new and diverse situations. Gibson’s concepts are still scientifically valid today and are the topic of numerous modern research projects.

Major concepts of dynamic perception theory that have proven clinically important to TAMO therapy include, 1) the functional coupling between the organism and the environment, 2) the active pick-up of task-specific information, and 3) the functional coupling between perception and action. Each of these three concepts is introduced with a description of the most important theoretical aspects. Each theoretical section is followed by a discussion of the application to TAMO therapy principles. Therapy principles are based on the clinical experience of the author. Some figures are used to highlight therapy concepts.

**FUNCTIONAL COUPLING BETWEEN ORGANISM AND ENVIRONMENT**

**Theory**

Dynamic and traditional theories of motor control differ in their interpretation of the functional relation between the organism and its environment. Traditional theories suggest that the environment serves as a stimulus to activate appropriate, preordained motor reactions, which are controlled by the CNS. Dynamic theories describe motor behavior as the result of the reciprocal interactions between many subsystems (components) of the organism and the
From a dynamic viewpoint, motor behavior is controlled by the organism-environment system. Dynamic perception theory suggests that the organism is optimally attuned and adapted to the environmental niche in which it evolved. For function, the organism and environment form one system that is constrained to interact in a coupled mode. They affect each other. The reciprocal interactions between organism and environment adhere to laws of dynamics. Yet, due to the enormous complexity of biological systems, it is impossible to predict the exact contribution of each component. The exact conditions of the environment and organism differ even in similar situations; consequently, each situation demands unique movement patterns for optimal performance. Many skillful movements are new in their detailed structure. This implies that exact movement patterns may not be stored in fixed motor programs for later recall. Since actions cannot be seen in isolation from the situation in which they take place, the contribution of the CNS to motor control must occur in collaboration with peripheral and external forces and influences. External and peripheral forces have a considerable influence on actions. Actions are defined as goal directed movements. Concepts associated with the functional coupling between organism and the environment have a profound impact on TAMO therapy principles.

Application to TAMO Therapy Principles

Spontaneous adaptability of self-organized motor patterns. The interactions between the organism and the environment are primarily expressed in self-organized motor patterns. Self-organized actions demonstrate to what degree movements can be adapted to existing, natural situations. Adaptive behavior is inherently not standardized but variable. Adaptability of self-initiated movements to diverse situations is a significant functional skill. Insufficient adaptability of spontaneous behavior limits functional skills.

For example, a patient may seek postural stability by statically keeping the pelvis in an anterior tilt and the spine in extension. When creeping with such a static posture, the progressing leg pulls the pelvis and spine sideways with little motion in the hip joints. As a result, steps are very short (Fig. 1A). After a one-hour treatment session, this 18-month-old child is very capable of spontaneously producing well-adapted creeping patterns. He dynamically stabilizes the legs while pelvis and trunk move in perfect alignment. The weight-bearing hip pushes into extension, leading to long steps as the distance between both knees indicates (Fig. 1B). The treatment did not address directly motor patterns of creeping. The therapist selected to work on the adaptability of the legs to the support surface in various positions. She assumed that learning to dynamically stabilize against the support surface and to push off it in a variety of patterns would improve performance. Therapy took place in dynamic sitting, supported standing and during transitions between sit to quadruped and squat positions. Gentle therapeutic input gradually modified the loading pattern of the legs in these situations. The child was playing during these activities and thus he determined the movement excursions. The therapist’s loading vector was dynamically adapted to various phases of his movements. Yet, the handling input was so gentle that it did not move the child; instead, the therapist waited for the child to

![Fig. 1A. Spontaneous behavior before TAMO treatment. This 18-month-old toddler creeps with small steps because pelvis and leg move together for stepping forward (see text for more information).](image1)

![Fig. 1B. Spontaneous behavior after TAMO treatment. The legs push off the support surface with a task-specific force vector. This leads to big steps, as indicated in the distance between the feet. The body posture is well adapted.](image2)
adapt to the modified pressure distribution at the support surface contact. Although the child’s adaptations were not perfect in the beginning, the behavior was no longer static and adaptations improved with repetitions.

The opportunity to explore various adaptations in a safe situation leads to the discovery of a variety of movement possibilities for similar situations. Static behavior thus changes to dynamic and variable patterns. The efficiency of such movements varies; some movement attempts may be unsuccessful. But all of them are important to learn what works and what does not work. The therapist never inhibits nor corrects motor components that may interfere with more skillful movements. Instead, it is expected that the patient discover different, more adaptable patterns in response to the therapist’s loading input. The therapist’s loading input changes the force distribution on the body as naturally fits the situation. This way, situations are presented that the patient cannot yet create and consequently has not yet explored. A successful re-organization does not occur when the therapist’s loading input does not fit the situation or when the activity is too difficult for the patient.

Changing conditions of task and environment further encourage exploratory actions. Spontaneous, self-organized actions range from active adaptations in natural care taking situations to independent movements. Some skills may only be possible within a narrow range of conditions. Yet, even repetitive and simple movements show pattern variability at any age, because situations are not identical. In contrast, patients with a movement disorder often use stereotypic patterns in a variety of situations. Their attention to the specifics of a situation seems to be disturbed. Adaptability to changing situations requires gathering crucial information about the situation in which a task is planned.

**ACTIVE PICKUP OF TASK-SPECIFIC INFORMATION**

**Theory**

The adaptation of postures and movements to constantly changing situations requires specific and dynamic information about the environment in which we act, our position relative to environmental features and the relation between various body segments. The focus of task-specific information is only on those relations and changes of relations that are essential for the planning and execution of an action. General information that has no value for the intended action is not task-specific. From a dynamic perspective, perception is information-based and does not build on sensation. Sensation is defined as consciousness of the impact of the environment on the body. Sensation is imposed on the body and is received through a specific sensory channel. We can attend either to an incoming sensation or, alternatively, shift our attention to the available information of a stimulus. We move eyes, head or body to enhance the specific information that we want to obtain. We actively select the information that is of value to us at that moment and we obtain such information through all pertinent sensory channels.

The information of a stimulus differs from the sensation of a stimulus. Research in early perception has shown a collaborative interaction between all sensory systems and the equipotentiality of different types of information. Major parts of such information are therefore redundant. It is important to realize that task-specific positional and velocity references are not restricted to one specific sensory channel.

Perceptual systems attend preferably to dynamic events, because they provide more information than static situations. Meaningful information lies in the dynamic transition. This allows even very young infants to capture rules of pattern change; consequently infants perceive moving objects or persons as unified and coherent events. Size and form of objects and persons remain constant for the observer under varying conditions of illumination, viewing angle or distance. This indicates that invariant properties are recognized in spatiotemporal transitions, which may explain why newborns recognize any human face in various situations.

To perform a successful action, relations between objects and subjects must be perceived prospectively. We need to know in advance how the situation will unfold while we move. Without that knowledge, we could not plan anticipatory actions including the timely deceleration of movements in order to successfully grasp objects or prevent bumping into them. Relying on feedback would not work there. In addition to capturing rules of pattern change, we also understand the time to contact at the present gap closure rate. This is based on lawfully changing information that is picked up visually. Studies have shown that even the youngest infants reveal remarkable abilities once the investigator takes a dynamic approach to perception. Information about the existing structure in the environment can be directly obtained based on spatio-temporal transitions that follow physical laws. Re-constructing the environment from various depth cues is therefore superfluous.

Learning of motor control involves learning rules of coordination on a perceptual level rather than memorizing specific motor patterns. Discovering these rules of coordination allows generalization of an acquired skill to a variety of situations with similar demands. Repetition and experience help patients to discover what needs to be monitored, that is, to which information to direct attention.

Research in early perceptual skills has led to a major shift in understanding perception. It has become clear, that the perceptual system is from the onset very skillful in picking up dynamic and specific information that is important for an action. Various perceptual competencies are present long before they can be applied to motor acts. Infants don’t have to learn to convert sense data into perception and differentiation of perceptual information is further refined through active exploration and new perceptual skills are continuously learned.
Application to TAMO Therapy

Ability to pick-up information that best supports the action. The active pick-up of task-specific information is usually insufficient in patients with a movement disorder. Information about the body and its surroundings is limited because variability of motor behavior is restricted. To achieve some functional independence, many patients rely on relatively few, mostly compensatory movement patterns. For example, a 6-month-old infant finds some security by statically stabilizing one leg against the other in the supine position (Fig. 2A). As a result, the contact of the legs with the support surface is very small. In addition, he pulls the forefoot off the support and reduces the contact to the heels only. The somatosensory information that can be obtained from this posture is minimal which reduces controlled movement excursions to a very narrow range. When the therapist provides more positional information through her handling input, the infant spontaneously reorganizes his posture: he extends his legs, achieving a larger contact with the support surface and thus ample orienting information. The therapist’s loading through the legs does not push the legs into extension. Instead, her dynamic loading vector suggests to the infant to gradually increase the contact with the support surface from the heels to the low leg. The increased postural stability that is achieved with bearing weight on the legs makes it possible to open the hands, supinate the forearms and re-orient the feet (Fig. 2B).

Early neurotherapeutic approaches proposed that proximal control is achieved before distal control. TAMO approaches this problem differently by not looking at the body in isolation. Instead, the focus is on the relation between the body and its surrounding and on the information that is available with the existing movement pattern. For example, when rolling from supine to side-lying, head and arms need to move freely. This necessitates a caudal weight shift. Figure 3A reveals in side-lying, this infant lifts legs and arms into the air instead of dynamically bearing weight on them against the support surface. Weight is shifted cephalic resulting in a very laborious rolling pattern. In treatment, the therapist does not correct any motor component. Instead, her loading input gradually changes the information about the pressure distribution at the support surface contact to pelvis and legs. After a short time, the infant spontaneously shifts the weight caudally. As in supine, the caudal weight shift leads to a re-organization throughout the whole body. The infant activates the trunk, orient his head perfectly and slides the left arm across the support surface in anticipation of the planned action (Fig. 3B). His hands are open and his legs assume an appropriate asymmetrical weight-bearing posture. This infant needed only task-specific information to spontaneously produce a new movement organization. Much time may be wasted in therapy with practicing specific motor patterns when the deficiency lies in picking up appropriate information.

Static postures are a typical feature of movement disorders. Even during transitions, patients may keep large segments of the body immobilized. For example, when rolling from supine to prone, this 6-month-old infant keeps the feet tightly pressed against each other throughout the whole transition (Fig. 4A). The information that is received from the elevated leg posture does not match rolling, but rather a static posture. To shift the center of mass, he moves the head out of alignment with the body. The activation pattern of legs, trunk, arms and head do not appear to be coordinated with each other. The visual and vestibular information does not appear to be synchronized with the feedback from the body. The infant gives the impression of not knowing to which information he should attend. With therapeutic loading input through the low trunk and pelvis (Fig. 4B), he spontaneously assumes an asymmetrical pattern of bearing weight through the legs which allows him to utilize the beautiful movement organization that is available to him for rolling. The infant’s adaptations to the therapist’s informational handling unveils his ability for prospectively organizing his activation.
patterns for rolling (see Figs. 2B, 3B, and 4B). Not every patient has such a high level of competence. But every patient has the potential to improve. In TAMO, improvement is measured in increased adaptability, increased balance and increased range of movement excursions. Repetition of an activity helps patients to discover which information needs to be monitored. The value of such perceptual learning can hardly be overemphasized.

In TAMO, any input is considered a potential source of information. Therefore handling input must always provide meaningful and task-specific information. The therapist slightly accentuates gravitational force vectors that naturally load the body. This draws the patient’s attention to the information that is associated with an action. To increase informational input to body segments that are not in contact with a surface, pliable objects, such as pillows or towels may be used to establish contact for bearing weight dynamically. Therapeutic input is never dominating, but very gentle and dynamic. The therapist never gives resistance but allows self-activation and exploration of actions that are available to the system at that moment. Changes of the direction or intensity of therapeutic loading must be subtle, slow and succinct to allow postural adaptations by the patient. The capacity to perceive information for many movement phases seems to be important for optimal movement control and for achieving better perceptual differentiation. The gradual and slow changes associated with TAMO handling appear to help patients to feel secure, as does drawing attention to an adaptive contact with the support surface. Patients will explore new movement options only when feeling safe. Making the support slightly unstable encourages a broader range of postural adaptations. Alternatively, more external support is given as is natural for an earlier skill level; sufficient support allows adequate adaptations to be learned. This requires consideration of the various stages of skill development based on working with forces produced by the organism and the environment rather than focusing on the specific configurations of patterns.

TAMO handling never modifies a pattern configuration through guidance of movements, correction of movement components or stimulation of muscle groups. Sensory stimulation, resistance, mechanical support, traction, stretching and other facilitation techniques cannot be reproduced by the patient; therefore they are not used in TAMO therapy.

The changing loading vectors of therapeutic input cannot be seen by an observer; neither is the patient’s problem solving obvious, except that patients may noticeably quiet down, become attentive and their actions become more skillful. This may be most striking when treating hyperactive children. The observed movements often look relatively easy. Unless the observer knows the patient’s limitations, the full scope of ongoing learning may not be
appreciated during the treatment. Following therapy, patients spontaneously practice what they have learned in the therapy session. They show more varied movement patterns and possibly new skills. Such behavior elucidates the reciprocal interaction between perception and action.

**FUNCTIONAL COUPLING BETWEEN PERCEPTION AND ACTION**

**Theory**

Perception and action are functionally coupled for performance. They act as one system. This dictates that motor patterns cannot be seen separately from the information that contributes to their formation. Relevant information changes parameters that affect motor patterns. The perceptual system links the environment to the action system. Perceptual information indicates which actions are potentially possible within that environment. Capabilities change, especially during early phases of development. Consequently, the same object affords different actions at different ages and skill levels. Movement, produced by the action system, is required to gather information. Motor output precedes the informational input. The acquisition of information is enhanced by re-orienting sensory organs, by manually moving objects or by changing body orientation. We also move to turn away from unwanted stimuli. Very young infants are already capable of shutting out overwhelming sensory stimulation under certain conditions. They can attend to stimuli that are interesting to them. This shows that we need not be exposed to a bombardment of stimuli, but we can selectively and actively gather information that is meaningful to us. Instead of considering information gathering as a passive act of seeing, hearing, or feeling stimuli, that are imposed, Gibson suggests that the organism is selectively and actively looking, listening and touching. Without postural control, exploration of the environment is severely restricted. Without new information, it is difficult to produce new controlled motor patterns. Thus, a continuous perception-action cycle is formed.

Some information-based actions need no prior experience or learning; they are present at birth and are also present in persons with severe neurological impairment. Newborns have protective mechanisms in place; for example, they attempt to manually intercept an object moving in their reach and to adapt the speed of the arm movement to the speed of the moving object. Coupling between perception and action is not reserved for humans only. It has also been documented in animals. For example, coupling between perception and action is obvious, when observing pelicans dive into the water to catch a fish: they fold their wings precisely at the correct moment even when they have had no prior experience; otherwise they would break their necks or their wings. Humans automatically adapt the length of the last few steps before reaching an obstacle; thus they always arrive in a position to step on or over it.

The general orientation of the whole body determines the orientation of perceptual systems. A stable body posture relative to the ground ensures stabilization of the head. This confirms that the ground is the fundamental frame of reference for spatial perception. Spatial orientation is related to planes and directions that stay constant and stable. The force of gravity and the visual horizon provide a stable frame of reference and serve as a coordinate system. The counter force from the support surface is another force vector that is used as a reference for spatial perception and also for body perception. Due to our body weight we provide pressure against the ground (in the direction of gravity) and we receive an equal amount of counter pressure from the ground. If our support surface is not horizontal, we pick up the deviation from the vertical, due to gravity's influence and thus we know that we are positioned on an incline. When forces other than gravity act on our body, as happens when we fly in an airplane, we easily become disoriented unless we see the horizon. Orienting skills are developed through interaction with gravity and with the support surface and are enhanced through the reciprocal interactions between perception and action. Spatial and body coordinate systems need to interact.

Studies with adults investigated the use of somatosensory information to obtain dynamic information about forces and spatial orientation in connection with balance. Orienting information provided through light touch at the fingertips did guide the musculature at the base of support for standing balance. In that situation, touch did not provide a direct support; yet it asserted a powerful influence on balance control by contributing to spatial orientation.

**Application to TAMO Therapy Principles**

Synchronize perceived information and action. When postural adjustments of the lower trunk, pelvis and legs are lacking, patients balance with excessive movements of the head, upper trunk and arms. The exact head position is then determined by balancing needs and not by the need to pick up task-specific information. The resulting variety of head orientations provides very inconsistent information even for similar situations. Feedback from the various sensory channels is disjointed since the movement is not coordinated. This may further increase any postural instability (Fig. 5A). In contrast, a typical 3 months old infant shows a stable upright head posture for consistency of orientation. Postural adaptations consist of pronounced trunk extension to keep the head and the incoming information stable. Adaptive trunk extension is the skill in this action (Fig. 5B).

Systematic interaction with gravity and the support surface is used to establish a functional orienting system. Adequate postural adaptations around gravity and the support surface free the head for orienting. There are various stages of acquiring orienting skills. During early phases, weight is born dynamically on the cephalic segments of the body as a consequence of uncontrolled kicking motions and unopposed gravitational torques while in prone and supine. Undue and consistent inhibition of such random movements by the therapist reduces the variability of dynamic weight-bearing patterns, which is not desirable. By
about 3 months, the weight-bearing surface starts to shift to the lower trunk and the head becomes free for intentional spatial orientation. Now, the caudal segments of the body learn to orient to the support surface through goal directed movements of the upper body, especially while in the prone position. Selective stabilization against the support surface guarantees controlled movements in the rest of the body and counteracts destabilizing gravitational torques. During the course of development, each segment of the body interacts adaptively and dynamically with the support surface. The pressure of bearing weight at the support surface contact informs about the orientation to the horizontal-sagittal and the vertical planes. Changes of the distribution of the pressure of bearing weight contribute to more differentiated perception and establish more differentiated movements. Efficient orientation to gravity is based on adaptive and dynamic patterns of bearing weight.

In addition to improving spatial perception, treatment also has to address body perception. Information about one’s own body may be fragmented in connection with perceptual-motor problems. Contributing to it are postures that never allow dynamic weight bearing on certain body segments; those body segments are consequently stiffly stabilized. On the other hand, postural inactivity and rather passive postures equally limit information pick-up, even if the contact with the support surface is large. Bearing weight dynamically is used to explore available movement possibilities in either situation. Therapeutic handling input needs to consider the information that is provided. For example, for a child who tends to fall forward in sitting, one would instinctively want to block the body from falling further forward by supporting the body from the front. However, support to the chest encourages the child to seek stability and security by leaning forward into that support. Consequently, such handling strengthens the movement that causes the child to lose balance; also, the child is prevented from finding a better movement strategy. In contrast, TAMO handling does not support from the front in this situation, but handles from the back of the trunk. The therapist changes the loading pattern from an anterior-posterior to a cephalocaudal direction. Thus the child is re-directed to seek stability by leaning into the natural support surface contact, which is formed by the thighs and the buttocks at the most skillful level. Before that stage is reached, patients are encouraged to lean on the arms or to lean against a back support. Proper head orientation can also be achieved with an early strategy of pronounced trunk extension. At a very early stage, patients are expected to actively adapt the head posture while the therapist provides adequate, dynamic support to the trunk and pelvis. Subsequent goals are adaptations of the upper thoracic spine, with or without arm support. Coordinated shifting of the weight of the trunk and pelvis occur later. In each phase of treatment, patients are taught to orient cephalo-caudally around gravity according to their skill level.

TAMO handling includes also a purely informational touch that does not change the loading distribution. Information about spatial orientation can be enhanced through a very gentle touch that yields when the patient seeks mechanical support. These subtle, gentle forces provide information about body alignment and spatial orientation without offering physical support.

Newly acquired perceptual-motor skills need to be always implemented into the actions and positions that the patient usually performs. The new organization should result in better coordination, but movement patterns may be unstable in the beginning. It is not uncommon to see patients alternate between old and new movement strategies. This is an indication that more than one pattern can be used in the same situation. It is important to start treatment with the movement patterns the patient spontaneously assumes; thus, patients learn how to move out of preferred and habitual patterns before exploring new movement possibilities that better utilize appropriate external forces.

Fig. 5A. Spontaneous behavior without treatment. This 11-month-old girl needs to tilt the head to counteract the gravity dominated body posture. Perception and action are not matched. 5B. Typical motor behavior. This 4-month-old typical infant adapts the posture of the upper trunk to counteract the age appropriate inactivity of the low trunk. Her adaptations allow a vertical head posture for consistent information pick-up.
SUMMARY

TAMO therapy corresponds well to the theory of dynamic perception. Optimal adaptations to gravity and the support surface are important therapy concepts and shift the focus of motor control from the CNS to the interactive processes between the organism and the environment. Variability of motor patterns is required to adapt movements to diverse situations and tasks. High priority is placed on the information that can be obtained with prevailing movement patterns. Through handling input, the therapist directs the patient’s attention to the information that is most important for the task and the momentary situation. Frequently, this information addresses the adaptations at the contact with the support surface. This contact needs to change dynamically before and during movements. Patients learn that the pressure distribution at the support surface contact represents a reliable reference for self-organized formation of that pattern. TAMO therapy works on functional activities that are important to the child and family. TAMO handling input consists of a gentle, dynamic loading vector that accentuates gravitational force vectors that naturally load the body. The therapist waits for the patient to actively re-organize to the new situation created by this loading. The emerging self-organized movements are new and well adapted to the patient’s present skill level.

REFERENCES