
Children Rehab Info 1

Supporting the sleep of children with special needs – MiS Micro-Stimulation®

IGAP

Institute for Innovations in Healthcare
and Applied Nursing Science

children-rehab



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Dear Reader,

The topic of sleep and being awake all night is a big problem for many parents of a child with special needs. The children and their families suffer a lot if they don't get enough sleep – and this sometimes stretched over for many years.

Studies show (e.g. Quine, 1991) that children with mental disabilities wake up more often at night, and they need considerably more time to fall asleep again.

Quine also found that 44% of children with Down's-Syndrome, 71% of children with Cerebral Palsy (CP), 57% of children with an unspecific brain damage, and 83% of children with disabilities caused by accidents, prenatal developmental disorders, fetopathies, genetic, or metabolic disorders, suffer from sleep problems.

Another study (Kotgal, 1994) found that children with CP move considerably less during sleep. They also had a high percentage of respiratory disturbances, which they couldn't regulate themselves by moving their body.

You see, there are many children and parents who have to deal with this issue. I hope that this brochure will give you some useful information and suggestions on the topic of sleep for children with special needs.

Enjoy reading it!

A handwritten signature in black ink that reads "V. Brinks". The signature is stylized and cursive.

Director Pediatrics of the IGAP Institute

Sources:

Durand, V.M.: *Schlaf gut! Ein Ratgeber für Eltern behinderter Kinder*, 1998

Woltemade / Behrens / Mühlhan: *Studie über die Wirksamkeit des MiS Micro-Stimulations-Systems Thevo-Adapt „Schlummerstern“*

Quine, L.: *Sleep problems in children with mental handicap*, in: *Journal of Mental Deficiency Research*, 1991, Vol. 35

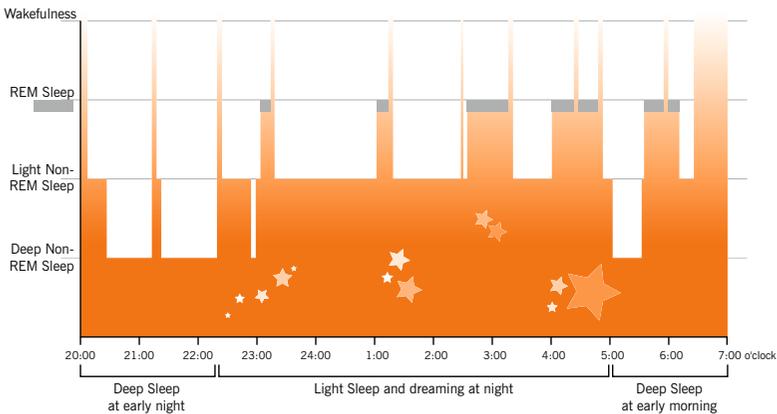
Healthy sleep and the different sleep phases

Sleep is divided into two broad alternating phases:

- 1. REM Sleep (Rapid Eye Movement Sleep) and**
- 2. Non-REM Sleep (Non Rapid Eye Movement Sleep)**

Sleep in the REM phase is light. In this phase we dream, process experiences, learn, and wake up easily. Non-REM Sleep is very deep sleep. We show considerably reduced brain activities and it is difficult to wake up. It therefore seems plausible that intensity, duration, and frequency of REM Sleep decreases with advancing age. Studies show also that mainly REM Sleep is disturbed in children with mental disabilities.

Fig.: Sleep pattern of a healthy child from 6th month of life



The grey fields of the figure are peaks of the REM phases and indicate normal, healthy awake phases at night. They are called “partial awakening”. Children especially can have problems getting back to sleep after this partial awakening. Adults without sleep problems normally do not remember these short awake phases at night. Children can easily be disturbed in their sleep by upsetting dreams or because they lose their body perception. Often they cannot get back to sleep without recognizing that they are awake. Children with physical or mental disabilities have even more problems than children with normal development.

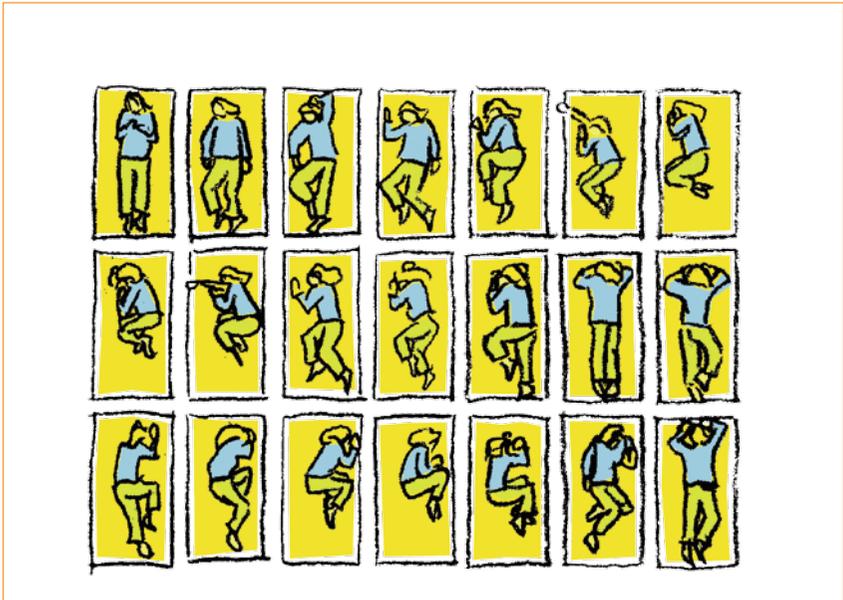
Bodily restrictions and sleep disorders

Movement limitations can cause sleep disorders in children with cerebral movement disabilities. Spasticity, postural deformities, contractures, or respiratory problems have a negative influence on children's sleep.

It is reported, for example, that adults who suffer from spasms often feel like they are falling. This is due to the relaxation of their muscles when falling asleep. Their brain receives too little information from the body about its position and the surface the body lies on. This leads to an irritating uncertainty in the body perception which hampers sleep.

Another problem is that immobile children are barely able to reposition themselves. This, however, is crucial for a healthy and restorative sleep.

Fig.: Movement pattern of a healthy person at night



A healthy person turns quite frequently at night to avoid stressing one side of the skeletal apparatus. Lying in one position over a long time period may lead to pain, and in extreme cases, to pressure ulcers.

Sleep disorders

To be able to treat a sleep disorder it must be recognized as such. The sleep requirement, however, varies for each child and must be viewed on an individual basis.

Age in years	Amount of sleep per day
0.5	14 +/- 4
1	14 +/- 3
2	13 +/- 3
5	11 +/- 2
10	10 +/- 2
15	8 +/- 1

The amount of sleep indicates the total sleep requirement including afternoon naps or other sleep phases during the day.

(acc. to Inglowstein)

When evaluating if sleep disorders are existent or not, experts try to draw on the subjective sensation of the participants. In general, it matters less how long somebody sleeps, but how they feel in doing so. A child that lies in bed for 8 hours may still suffer from sleep disorders, when they awake in the morning feeling totally knocked out and unsatisfied. What counts here is not only the quantity, but rather the quality of sleep.

Sleep disorders are mainly divided into problems with falling asleep and problems with sleeping through the night. It is remarkable when talking about children with disabilities, that they have bigger problems in sleeping through the night than with going to bed at night. In an interview, 84% of 90 families with a physically and/or mentally disabled child reported that their child does not sleep through the night. The children awakened up to 8 times a night. However, the largest percentage (39%) woke up 3 to 4 times a night.

(Source: Study on the effectiveness of MIS Micro-Stimulation®)

How does Micro-Stimulation work?

One possibility to treat sleep disorders, which are based on motor limitations, perception disorders or pain, is MiS Micro-Stimulation®. This active principle improves the mobility of children and the ability to sense their body's position. The lying systems with Micro-Stimulation consist of an underframe providing movement and a specially vented soft foam mattress.



Flexible wing suspensions integrated in an underframe

The wing suspensions of the system interact with the movements of the child. The child can move easier than on conventional systems and body perception is improved. Moreover, equal pressure distribution is beneficial for pain therapy or pressure ulcer treatment.

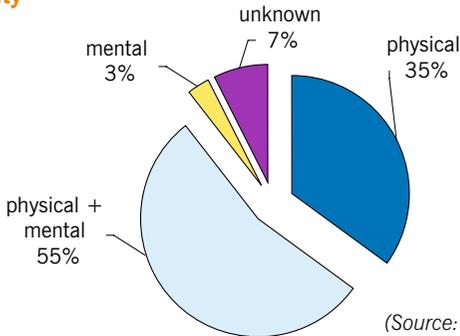
Positive effects MiS Micro-Stimulation® systems have on children:

- Support of their own movements
- Prevention of spasms and contractures
- More satisfying sleep and mental balance
- Reduced pain
- Improved ability to fall asleep and sleeping through the night
- Prevention and treatment of pressure sores

Results of the study on the effectiveness of MiS Micro-Stimulation® systems

The effectiveness of the MiS Micro-Stimulation® system for children was evaluated in a study with 85 children. The children either had purely physical, mental, or multiple disabilities (see figure).

Disability



(Source: IGAP, Sleeping Star Study 2006)

The result of the study is that 46 of 85 children showed improved sleep behavior. This makes a positive result of approximately 54%. Sleep behavior became worse in only 4 of 85 children.

Please contact us to obtain the complete study or for more information.

Up to now, MiS Micro-Stimulation® systems have been used for children with the following clinical pictures:

- Cerebral palsy
- Spina bifida
- Craniocerebral injury / coma vigil
- Various syndrome diseases
- Children with burns
- Developmental disorders of an unspecific genesis

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