Information for parents

GENTLE FLAT HEAD TREATMENT

DEAR PARENTS,

what has come into your hands is an information booklet on how to care for a child wearing a cranial remoulding orthosis due to a head deformity. You will find information on different types of deformities here. The booklet also includes examples of baby positioning in daily activities to prevent skull deformities or the deterioration thereof.

We hope that you will find this information useful and helpful to finding a successful solution to your child's problem.

CONTENTS

1

SUMMARY OF TREATMENT WITH THE USE OF AN ORTHOSIS

1.1 Cranial remoulding orthosis

FOR CHILDREN AGED BETWEEN 4 AND 14 MONTHS

Head shape deformity became more frequent after the Back to Sleep Program focused on preventing SIDS*. Nowadays, more than 3% of newborn babies** have severe or very severe head shape deformity. Up to 50% have mild or medium deformity.

Cranial remoulding orthosis is lightweight and custom-made. The inner part of the orthosis is round-shaped, allowing the child to sleep and move without any pressure being exerted on the flattened area of the head. The orthosis does not interfere with any children's activities and most parents say that their children have adapted quickly.

Research*** shows that orthotic treatment using a helmet is the most effective solution of severe head shape deformity. The cranial orthosis offers a simple solution for children with an abnormal head shape. The head becomes more symmetrical and normally shaped when its growth is given the right direction by the effect of the orthosis.

*SIDS - Sudden Infant Death Syndrome. It occurs often if babies lie on their bellies.

**Deformational plagiocephaly: a follow-up of head shape, parental concern and neurodevelopment at ages 3 and 4 years; B L Hutchison, A W Stewart and E A Mitchell; Archives of Disease in Childhood September 2010.

***Effectiveness of Conservative Therapy and Helmet Therapy for Positional Cranial Deformation. Steinberg et al; Plastic and Reconstructive Surgery; March 2015

Pic. 1 Illustration of cranial remoulding orthoses

1.2 Treatment duration

TREATMENT TAKES USUALLY 4–6 MONTHS

The duration of treatment varies. It depends on how old the child was when the treatment began and how quickly he/she is growing. Children younger than 12 months complete the treatment within 4–6 months. Older children usually need longer treatment since their skull is growing more slowly, it is stronger and more resistant to change.

Cranial remoulding orthosis is not indicated in children younger than 4 months. Children younger than 3 months respond well to positioning. After three months, the baby starts turning and changing positions, positioning therefore loses its meaning. In this period, physician reassesses the shape of the baby's head to determine whether the baby needs treatment with the use of a cranial remoulding orthosis. After the 12th month, the brain and skull are no longer growing as fast as in the first year of life. Treatment with the use of an orthosis may be commenced at 14 months at the latest and finished at 18 months.

1.3 Wearing schedule

A 23-HOUR WEARING SCHEDULE IS CRUCIAL TO ACHIEVING SUCCESSFUL RESULTS

The orthosis is worn 23 hours a day to prevent any further abnormal skull growth. Any wearing schedule shorter than 23 hours may result in problems with the skull shape in the follow-up application of the orthosis or may not lead to optimum results. The orthosis is worn 23 hours a day even towards the end of the treatment.

There are several cases when the orthosis is not worn. It's a fever or flu, when the child is having a bath or when he/she needs daily treatment. The orthosis is also taken off during physiotherapy. Failure to follow the wearing schedule may result in scanning and manufacturing a new orthosis.

Day	Orthosis put on	Orhtosis taken off	Note
1.	1 hour	1 hour	Repeat the cycle during the day
2.	2 hours	1 hour	Repeat the cycle during the day
3.	4 hours	1 hour	Repeat the cycle during the day
4.	8 hours	1 hour	Repeat the cycle during the day
5.	23 hours	1 hour	Repeat the cycle during 24 hours

From the fifth day, the orthosis should be worn throughout the day with two half-hour brakes, the first in the morning and the second in the evening.

1.4 Common head deformities in children

Plagiocephaly (pic. 2) is a simple skull deformity. This shape is often associated with Torticollis or other cervical spine impairments which prevent full range of motion in the cervical spine. This results in the baby keeping his/her head in one position for a long time, causing flattening. Deformational Plagiocephaly usually poses a serious problem which should be treated in children with a moderate to very severe degree of head flattening.

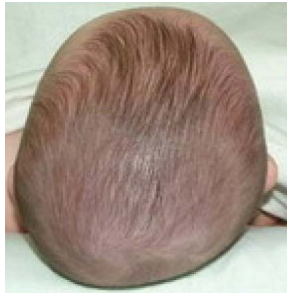
Pic. 2 Plagiocephaly

The head has the following characteristics (Pic. 3, 4)

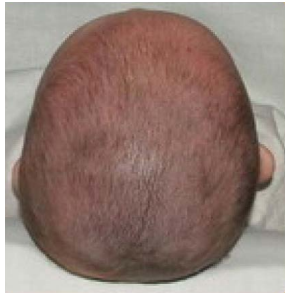
- There is flattening (posterior flattening) at the back of the head on one side whereas there is a prominent area on the other side.
- The ear is noticeably shifted forward on the side of posterior flattening.
- The forehead is shifted forward on the same side as posterior flattening.
- The eye and face may also be shifted forward on the side of posterior flattening and result in facial asymmetry.

Pic. 3 Child with Plagiocephaly before orthotic therapy

Pic. 4 Plagiocephaly after successful orthotic therapy



Pic. 5 Child with Plagiocephaly before orthotic therapy. Treatment commenced at 5 months



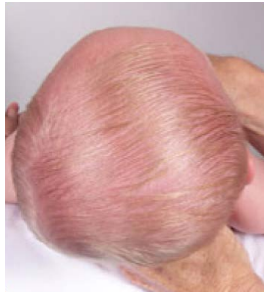
Pic. 6 Plagiocephaly after successful 2-month orthotic therapy

Symmetrical Brachycephaly (pic. 7) is a deformity relating to the proportionality of the child's head. This shape usually occurs in children lying supine most of the time and not turning their head to the sides. It's a serious problem which should be treated in children with moderate to very severe head flattening.

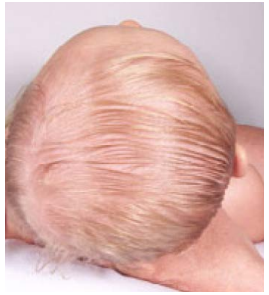
Pic. 7 Symmetrical Brachycephaly

The head has the following characteristics [Pic. 8,9,10,11]

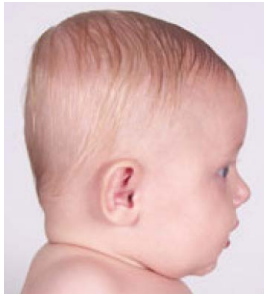
- Flattening is at the centre back of the head.
- The head is unusually wide with parietal prominence on both sides.
- Seen in profile, the head is higher and flattened more than normal heads.
- The forehead is prominent and may be shifted forward on both sides.



Pic. 8 Symmetrical Brachycephaly before orthotic therapy



Pic. 9 Symmetrical Brachycephaly after successful orthotic therapy



Pic. 10 Symmetrical Brachycephaly before orthotic therapy

Pic. 11 Symmetrical Brachycephaly after successful orthotic therapy

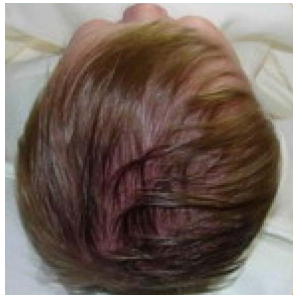
In children with asymmetrical Brachycephaly (Pic. 12), the unusual head shape is caused by a combination of Plagiocephaly and Brachycephaly. This shape is often associated with Torticollis, not allowing free movement in the cervical spine. This deformity is a serious problem which should be treated using an orthosis in case it is a moderate to very severe degree deformity.

Pic. 12 Asymmetrical Brachycephaly

The head shows the following characteristics (Pic. 13, 14, 15, 16)

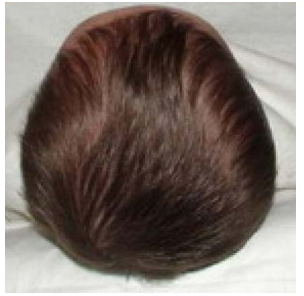
- Both rear sides of the head are flattened (posterior flattening), but one side is flatter than the other.
- The head is unusually wide.
- The head may be higher than a normal head and may be higher on one side than on the other.
- The ear may be shifted forward on the side of greater posterior flattening.
- The forehead on the side with greater posterior flattening may also be shifted forward.
- The eye and face on the side of greater posterior flattening may also be shifted forward, resulting in facial asymmetry.

Pic. 13 Asymmetrical Brachycephaly before orthotic therapy. Treatment commenced at the age of 4 months



Pic. 14 Asymmetrical Brachycephaly after successful 3-month orthotic treatment

Pic. 15 Asymmetrical Brachycephaly before orthotic therapy. Treatment commenced at the age of 7 months



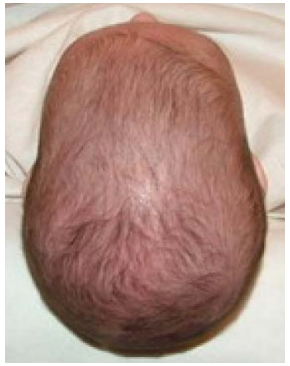
Pic. 16 Asymmetrical Brachycephaly after successful 3-month orthotic treatment

In children with Dolichocephaly (Pic. 17), the head is long and narrow. This shape most often occurs as a result of the baby spending most of the time on his/her side. Lying on the side is common in premature babies at a neonatal intensive-care unit. This deformity is a serious problem which should be treated using a remoulding orthosis in case it is a moderate to severe degree deformity.

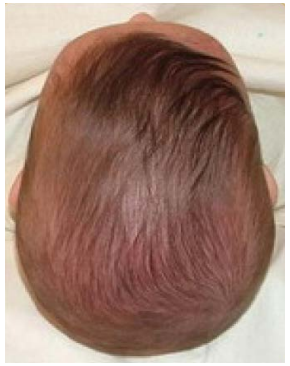
Pic. 17 Dolichocephaly

The head shows the following characteristics (Pic. 18, 19)

- The head is unusually long and narrow with no visible edge along the sagittal suture.
- Asymmetry may occur at the right and left diagonal dimension.



Pic. 18 Child with Dolichocephaly before orthotic therapy. Treatment commenced at the age of 7 months



Pic. 19 Dolichocephaly after successful 3-month orthotic treatment

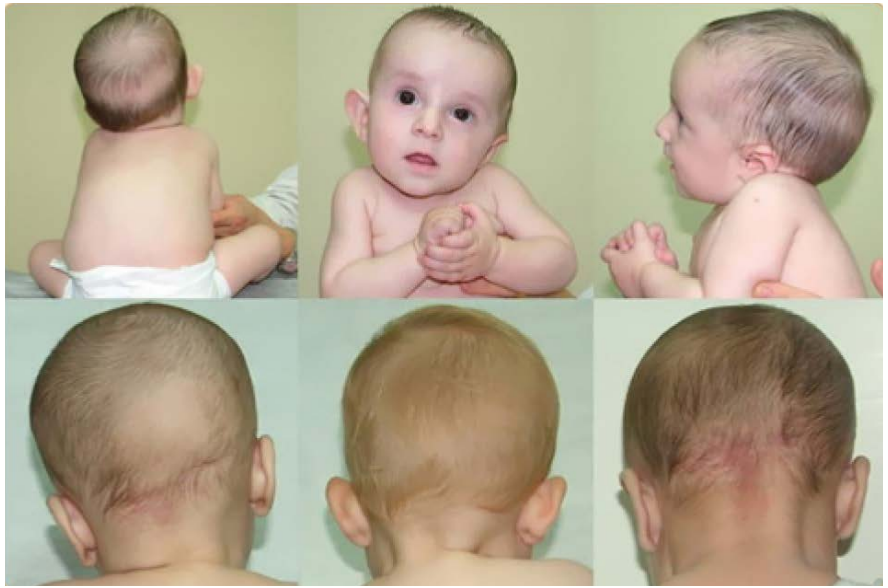
The shape of a baby's head with Dolichocephaly looks like the shape of a baby's head with Sagittal Suture Craniosynostosis. Physician should carry out an examination to distinguish Craniosynostosis from positional deformity.

Dolichocephaly	Sagittal Craniosynostosis
Case history of premature birth	No case history of premature birth
No border along the sagittal suture	Visible border along the sagittal suture
The head shape is not worsening	The head shape is worsening in the course of development

1.4.1 Torticollis and effect of positioning

Flattening might worsen after the birth, especially if the neck muscles are in tension, weakened or asymmetrical. This condition is known as Torticollis and contributes to problems with the head shape by preventing the head from turning to one side. Torticollis must be treated together with the use of a cranial remoulding orthosis.

Torticollis treatment usually takes place 2–3 times per week. A home exercise program is also important. It helps maintain proper length of the neck muscles and supports function of these muscles in common activities such as turning, sitting, crawling and playing. In addition to Torticollis, another cause of postnatal deformational Plagiocephaly may be long-lasting lying on the back against a hard surface – e.g. child seats, car seats, swings, pram. Before 1992, children used to be put to bed on their bellies which kept the weight from the rear of their head. A very successful campaign „Sleeping on the back“ has significantly reduced the incidence of the Sudden Infant Death Syndrome (SIDS), but on the other hand, using child seats and putting children to bed to sleep on their back throughout the night has helped develop head deformities.



Pic. 20 Child with left-sided congenital muscular Torticollis

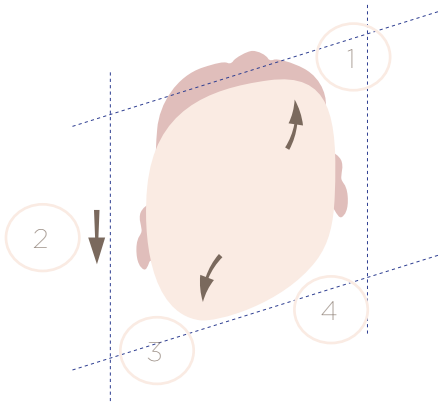
1.4.2 Craniosynostosis

One of less frequent causes of an unusual head shape is a condition known as Craniosynostosis. Some types of Craniosynostosis manifest themselves like Plagiocephaly. Craniosynostosis is caused by one or more cranial sutures accreting prematurely, resulting in the skull growing into an unusual shape. Physician distinguishes between the two conditions according to medical examinations. If Craniosynostosis is suspected, the specialist will order finer tests, such as CT or MR, to confirm the diagnosis. If a child has Craniosynostosis, a surgery to rearrange the skull bones is indicated. Both the brain and skull can grow normally then.

The shape of children's heads with Craniosynostosis varies depending on which suture is impaired and to what extent. Only physician can diagnose Craniosynostosis. Children experiencing any symptoms described below should be sent to a physician in order to exclude Craniosynostosis:

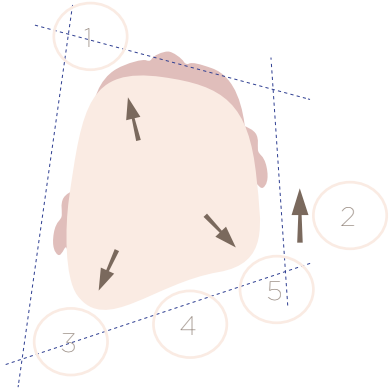
- Children with an unusual head shape and a palpable or visible seam along the cranial suture.
- The child's head shape is worsening despite positioning.
- Children with diagnosed Plagiocephaly whose condition is not improving or is worsening despite therapy using a cranial orthosis in compliance with the treatment program.

Craniosynostosis is a contraindication for the cranial remoulding orthosis therapy.



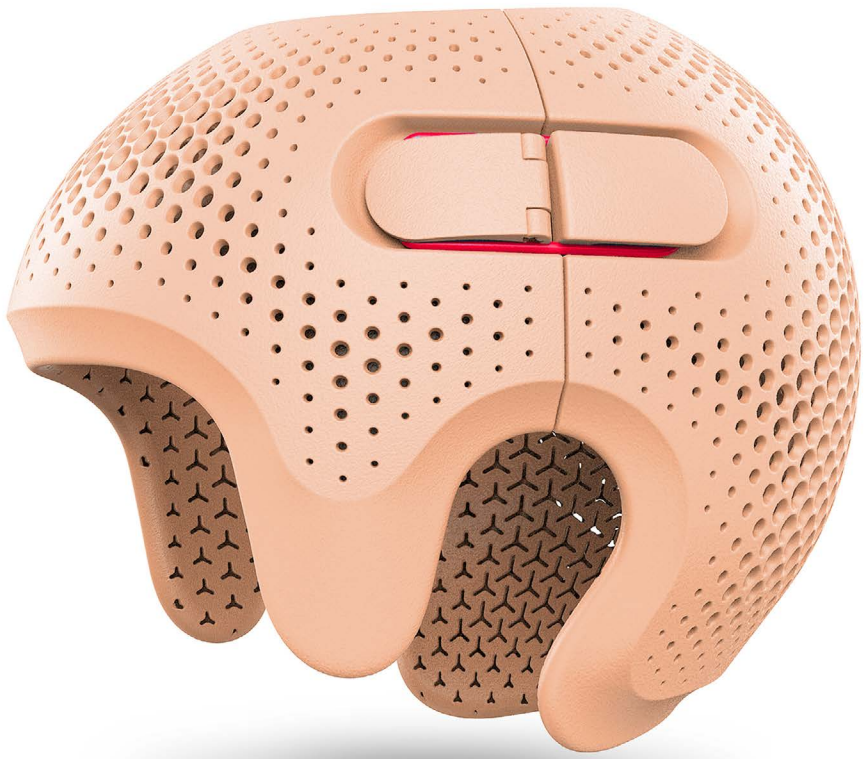
Pic. 21 Right-sided Plagiocephaly

1. Contralateral frontal bossing
2. Ipsilateral posterior ear shift
3. Ipsilateral occipital bossing
4. Contralateral occipito-parietal flattening



Pic. 22 Right-sided lambdoid Craniosynostosis

1. Contralateral frontal bossing
2. Ipsilateral anterior ear shift
3. Contralateral parietal bossing
4. Ipsilateral occipito-parietal flattening
5. Ipsilateral occipitomastoid bossing



2. Talee is unique

We combined our clinical experience with technical strengths and created a revolutionary patent-pending bio-responsive Talee technology.

BREATHABLE
Perforated structures make the orthosis breathable so that it allows ventilation, reducing baby's sweating.

LIGHT
We leverage the full potential of 3D printing to make Talee lighter.

THIN
Talee is thin to improve babies' comfort. Your baby will soon forget that it is wearing a helmet!

3

INSTRUCTIONS FOR WEARING AND CARE

1. Your child should wear the cranial remoulding orthosis 23 hours a day, however, he/she may need a few days to adapt. Follow the schedule by increasing the period of use gradually. Do not hurry up the schedule even if your child experiences no inconvenience. The wearing schedule has been developed to prevent skin problems and will help your child adjust to the orthosis. This schedule provides a safe way to adapt to the orthosis. The fifth day is considered the one when the child is wearing the orthosis for full 23 hours.
2. Do not use the orthosis when your child is feverish (temperature over 38°C). If he/she is running a temperature (up to 38°C), he/she can wear the orthosis, but you should check his/her temperature regularly. If it raises, stop wearing the orthosis. Resume the normal schedule as soon as possible.
3. Take the orthosis off during physiotherapy and put it back on as soon as possible after it's finished.
4. Take the orthosis off and clean it every day while bathing. Use only a non-perfumed, alcohol-based agent to clean the inner surface of the orthosis since other agents might be harmful to your child's skin. Wipe the inner surface of the orthosis properly with a clean cloth using an alcohol-based agent or use an alcohol-based cleaning agent together with a new soft brush. Wipe the orthosis dry. You can use a low-temperature hairdryer to dry the orthosis out – this also helps reduce the odour which sometimes arises in the orthosis.
5. Wash your child's head every day using shampoo. Put the orthosis on when both the head and orthosis are dry. Children with very sensitive head skin may use slightly hypoallergenic or natural shampoo. The orthosis should not get wet and should be taken off while bathing. Put the orthosis back on after bathing once both the head and orthosis are dry.
6. Your child may sweat excessively the first few days until his/her body adapts to the orthosis. It's a commonplace during this period, the orthosis may be taken off for a few minutes and both the head and orthosis may be dried out with a towel or low temperature hairdryer. The orthosis should be put back on after having been dried out. Do not use any baby powder, creams or towels on your child's head beneath the orthosis. These products may contain perfumes or substances which may lead to skin irritation. Dress your child in appropriate clothes to prevent excessive sweating.
7. If your child needs a haircut during the treatment, do not shave his/her head entirely. The contact of the head with the orthosis may lead to irritation when the hair begins to grow. Try to keep the same hair length throughout the treatment to prevent any problems with the shape which may result from greater or smaller volume of hair.
8. Always check the head skin after taking the orthosis off. Should you discover a red area that wouldn't disappear within one hour after taking the orthosis off, contact your orthotist immediately. This may indicate that the orthosis needs to be modified. If there is any skin damage, take the orthosis off and contact your orthotist. The orthosis should not be used until the head heals over.
9. After more than 48 hours without the orthosis, there may be some difficulty putting the orthosis on due to skull growth. Cut down on periods without the orthosis and contact your orthotist if you cannot put the orthosis on.
10. When putting the orthosis on, always check the straps and apertures and make sure to fasten them safely. Loose parts may be dangerous when inhaled or swallowed.
11. When the orthosis is off, make sure to keep it away from pets.
12. Explain the purpose of the orthosis to other caregivers and teach them to use, wear and take off the orthosis appropriately. Practice is important for the family, friends, caregivers and anyone else who takes care of your child.
13. If you have any questions or concerns about the care for your child, contact your orthotist. Any issues should be addressed quickly.

4

FREQUENTLY ASKED QUESTIONS

How do I know if the orthosis is all right or needs to be adjusted?

If you cannot see any red spots on your baby's head after taking the orthosis off or if these spots disappear within the 1-hour daily treatment break, the orthosis is all right and suitable for wearing.

How can we treat the head skin?

Treat the skin as usual daily. Wait for the cream to absorb. However, always make sure to put the orthosis on only when both the head and the orthosis are dry. Upon the occurrence of prickly heat or contact dermatitis, use such creams as to soothe and dry out the skin, not petrolatum-based ointments. If unsure, contact your orthotist.

How do I tell pressure sores from contact dermatitis?

If you take the orthosis off and find a red spot on the head which won't disappear within 1 hour after taking the orthosis off, it is likely to be contact dermatitis or a pressure sore. First, treat the spot with the cream you are accustomed to using (any protective cream or some sensitive skin lotion).

Line the contact point inside the orthosis with a thin cotton plaster then and put the orthosis on. After two to three hours, check the head if there has been any skin soothing or not. If the skin is soothed, with no signs of irritation and its condition is increasingly better, repeat the process. It is contact dermatitis. Some children may have more sensitive skin so it will need to be treated like this several times a day. If you have treated the skin and followed the above instructions, yet it has not improved, keep the orthosis taken off for a longer time (about 3–4 hrs), it is a pressure sore and the orthosis might need to be adjusted. Contact your orthotist. Treat the spot on the head regularly with some cream and line the spot in the orthosis with a thin cotton plaster until having the orthosis adjusted.

What do I do if my child hasn't been wearing the orthosis for several days?

If your child hasn't been wearing the orthosis for several days, you should find out if there are any pressure sores on his/her head. Put the orthosis on for about 2–3 hours and then take a break (take the orthosis off). Treat the orthosis and head as usual and wait for any potential pressure sores to disappear. If these disappear within 1 hour, put the orthosis on, make the application time longer and take a pause again. Repeat this procedure until you resume the 23-hour-a-day wearing schedule. This procedure may take up to 2–3 days. If the pressure sores do not disappear within 1 hour and you fail to resume the wearing schedule, contact your orthotist as soon as possible.

How long until we can see some improvement?

It depends, but there is usually some apparent improvement after only two weeks of wearing (first checkup). Greatest skull growth takes place in the first months of wearing the orthosis.

5

POSITIONING OPTIONS

An asymmetrical head shape may be partly improved through thorough and repeated positioning of the child in sleep and other activities. It depends on the child's age and the degree of deformity. The goal of positioning is to take the pressure off the impaired area.

5.1 Sleep

Pic. 23 Example of positioning in sleep

- Your baby should always be on his/her back while sleeping.
- Change the position of lights in the room to make your child tend to turn his/her head. Infants turn their head towards light.
- After your baby falls asleep, turn his/her head to the unaffected side.

5.2 Playing

Pic. 24 Example of positioning in playing

- When the baby is awake and you are with him/her, turn him/her to his/her belly and use toys to stimulate him/her.
- Parents often say their children don't like lying on the belly. This may be a result of weak back muscles. Use a rolled towel under your child's chest to lift his/her shoulders.
- Cross your legs and put your child on them so that he/she is lying on his/her belly.
  Support your child from below at his/her buttocks by your hands. You can stimulate your child in this position by toys again.
- Lying on the belly eliminates the pressure exerted on the affected side of the head for one thing and your baby exercises his/her neck, back and shoulder muscles for another.

5.3 Feeding

- Change sides you hold your baby on in feeding.
- Try to support your child's head on the unaffected side in feeding.

Pic. 25 Example of positioning in feeding

5.4 Travelling

- Limit the time spent by the baby on a hard surface – e.g. in a child seat.
- Use a folded towel or softening in the car seat to make your baby turn his/her head away to the unaffected side.

Pic. 26 Example of positioning while travelling

6

INTERESTING LINKS

www.taleetop.com
www.inventmedical.com

Should you have any questions regarding treatment using a cranial remoulding orthosis, please contact our workplace directly

your logo

Your workshop/company name

Your company address

Your opening hours

Your phone contact  your website  your e-mail