

A photograph showing a woman with short dark hair, wearing a white shirt, applying a piece of pink K-tape to the side of a young child's torso. The child is standing with one arm raised. The background is a plain, light-colored wall. The image is partially obscured by a blue banner at the bottom.

Birgit Kumbrink

K-Taping in Pediatrics

Basics Techniques Indications

K-Taping in Pediatrics

Birgit Kumbrink

K-Taping in Pediatrics

Basics – Techniques – Indications

With 300 illustrations in colour

Birgit Kumbrink
K-Taping Academy
Dortmund, Germany

ISBN-13 978-3-662-46584-4 ISBN 978-3-662-46585-1 (eBook)
DOI 10.1007/978-3-662-46585-1

Library of Congress Control Number: 2015942494

© Springer-Verlag Berlin Heidelberg 2016

K-Tape, K-Taping and Crosstape are trademarks belonging to Ingo Kumbrink and registered in the United States. K-Tape and K-Taping are also registered in the European Union and many other countries. For a list of all our current trademarks see www.bivix.com/marken. Unauthorized use is strictly prohibited. All rights reserved.

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, express or implied, with respect to the material contained herein or for any errors or omissions that may have been made.

Translation: Joanna Mountifield, Berlin
Cover Design: deblik Berlin
Cover Illustration: © Kumbrink

Printed on acid-free paper

Springer is part of Springer Science+Business Media (www.springer.com)

Preface

Dear Reader,

Five years after *K-Taping – An Illustrated Guide* was first published, with a primary focus on the treatment of adults, this new guide to *K-Taping in Pediatrics* highlights a part of the therapeutic spectrum in which we must work more sensitively and with more awareness than we already do with our fully grown patients. Not only are children more sensitive and delicate in terms of sensorimotor function, the feedback they provide to the therapist differs from that provided by adults. Children do not evaluate their therapist, a process which forms at least part of an adult's assessment. Children do not analyze or question the functional approach of their treatment. Their feedback focuses far more specifically on changes in their awareness or physical function that they may experience, although they may often be reticent in giving their response. Who hasn't treated a child and received a terse answer of »hmmm....good«, when asking for feedback on how something feels?

When working with children in general, and infants and children with disabilities in particular, visual feedback and noticeable changes in posture and movement patterns are often the only way to evaluate the success or progress of treatment. Feedback from parents can be helpful when working with children with disabilities, as they often provide intense support during therapy and in daily life, and are well-equipped to observe even tiny improvements or changes in the posture or movements of their child.

In recent years K-Taping applications have been developed specifically for children, and the »before and after« results have been exciting. Visible changes, sometimes apparent only minutes after application, demonstrate how effective K-Taping in the field of pediatrics can be. Based on this evidence that K-Taping therapy offers an effective, medication-free treatment option for infants and small children with congenital deformities, this guide focuses on early therapy for conditions such as congenital muscular torticollis (twisted neck), club foot, and other congenital deformities and misalignments.

As well as applications specifically for younger patients, *K-Taping in Pediatrics* includes many indications and application techniques relevant to the everyday practice of physical therapists and doctors, in addition to tips and expert knowledge garnered from over 15 years of study and practice.

Individual chapters cover the fundamentals (► Chap. 1) and differing application techniques (► Chap. 2) of the K-Taping method in detail, with particular emphasis on the treatment of children (► Chap. 3). However, the guide is directed primarily at certified K-Taping therapists who have completed either the K-Taping-Pro or K-Taping-Pediatrics course. It is recommended that those who wish to explore the full range and effectivity of this therapeutic method as applied to children complete their training at the K-Taping Academy rather than attempting to educate themselves from the book. The precise implementation of the various techniques, the specifics of handling the elastic K-Tape, and the correct positioning of a child's body for an application can only be learnt and practiced correctly under the supervision of a qualified instructor. In this way, the elastic K-Tape is transformed into a unique and effective tool for therapists and medical professionals.

Birgit Kumbrink

K-Taping Academy
Dortmund
Summer 2015

About the Author



Birgit Kumbrink

Founder and medical director of the international K-Taping Academy based in Dortmund (Germany), the author is an instructor of many years' experience and one of the most knowledgeable practitioners and teachers of the K-Taping method internationally. Birgit Kumbrink has published numerous articles about K-Taping in the medical press, and appeared on several German television and radio programs. She is responsible for developing an emergent elastic tape therapy from Asia into the K-Taping therapy that is so firmly established in Germany and across Europe today. Over the last 15 years, this therapeutic method has cemented its reputation as a useful and highly effective treatment in physical therapy, sports medicine, and other medical fields. Birgit Kumbrink has also been responsible for the integration of K-Taping into many after-care concepts, such as after breast cancer surgery, for example. She is the driving force behind the development of K-Taping techniques and applications, leading both national and international studies in cooperation with clinics and professional associations.

Qualifications:

- 1990: certified masseur and balneotherapist
- 1993: certified physical therapist
- Since 2000: director of the K-Taping Academy

Continuing Education:

- Manual therapy
- Manual lymphatic drainage
- Proprioceptive neuromuscular facilitation (PNF)
- Acupuncture massage (APM) therapist

Table of Contents

1	The K-Taping Method	1
	<i>Birgit Kumbrink</i>	
1.1	From Theory to Therapeutic Method	2
1.2	The Elastic K-Tape	2
1.2.1	Acrylic Coating	4
1.2.2	Indicators of Poor Tape Quality	5
1.2.3	Tape with Active Ingredients	5
1.3	Users and Fields of Application	5
1.4	Training for K-Taping Therapists	6
1.5	Crosstape	6
1.5.1	Function and Properties	6
1.5.2	Application	7
1.6	Basic Functions and Effects of K-Taping	7
1.6.1	Enhanced Muscle Function	7
1.6.2	Elimination of Impairments to Circulation	8
1.6.3	Pain Reduction	8
1.6.4	Support of Joint Function	9
1.7	Application and Removal of the Tape	10
1.8	Contraindications	11
1.9	Color Theory	11
1.10	Combined Therapy	12
1.11	Ground Rules for the Treatment of Children	12
1.12	Reference	12
2	The Four Application Techniques	13
	<i>Birgit Kumbrink</i>	
2.1	Muscle Applications	14
2.1.1	Muscle Function	14
2.1.2	Effect of the K-Tape Application	14
2.1.3	Application Technique for Muscles	14
2.2	Ligament Applications	16
2.2.1	Applications for Ligaments (Ligamenta)	17
2.2.2	Ligament Application for Tendons	21
2.2.3	Spacetape	23
2.3	Corrective Taping Applications	25
2.3.1	Functional Correction	25
2.3.2	Fascial Correction	27
2.4	Lymph Applications	28
2.4.1	Causes of Lymphostasis	29
2.4.2	Effects of Lymph Application	31
2.4.3	Application Technique for the Lymphatic System	31
3	Applications for Specific Indications	35
	<i>Birgit Kumbrink</i>	
3.1	Postural Defects and Disorders	39
3.1.1	Ventral Postural Disorder in Infants	39
3.1.2	Ventral Postural Disorder in Young Children	43
3.1.3	Three-Month Colic	45

3.1.4	Umbilical Hernia	47
3.1.5	Postural Disorders in Older Children	49
3.1.6	Hyperextension of the Knee (Genu Recurvatum)	53
3.1.7	Misalignment of the Knee Axis	57
3.1.8	Asymmetry of the Cervical Spine	59
3.1.9	Scoliosis	63
3.2	Deformities of the Foot	67
3.2.1	Metatarsus Adductus	67
3.2.2	Flat Foot (Talipes Valgus)	77
3.2.3	Spastic Sickled Foot	79
3.2.4	Club Foot	83
3.2.5	Talipes Calcaneus	87
3.3	Brachial Plexus Palsy	89
3.3.1	Scapula Alata	89
3.3.2	Elbow Extension Deficit	91
3.3.3	Shoulder Internal Rotation	93
3.3.4	Forearm Pronation	95
3.3.5	Palmar Flexion Posture	97
3.4	Infantile Cerebral Palsy	101
3.4.1	Spastic Thumb-in-Palm Deformity	101
3.4.2	Spastic Hand Deformity	103
3.4.3	Spastic Talipes Equinus	105
3.5	Spina Bifida	107
3.5.1	Inactive Musculature	107
3.5.2	Scar Tissue	109
3.6	Scar Treatment	111
3.7	Disorders of the Knee	115
3.7.1	Osgood–Schlatter Disease	115
3.7.2	Patellar Misalignment	117
3.8	Pulmonary Disease	119
3.9	Dysphagia	121
3.9.1	Swallowing Disorders	121
3.9.2	Hypersalivation	123
3.9.3	Hypotonus/Hypertonus of the Mouth Region	125
3.10	Myofunctional Disorders	129
3.10.1	Shortened Upper Lip	129
3.10.2	Open Mouth Posture	131
3.11	Headaches	133
3.11.1	Tension Headache	133
3.11.2	Temporal Headache	139
3.12	Sinusitis	141
3.12.1	Sinusitis Maxillaris	141
3.12.2	Sinusitis Frontalis	143
3.13	Childhood Incontinence	145
	Reference	145
	Service Part	147
	Index	148

The K-Taping Method

Birgit Kumbrink

- 1.1 From Theory to Therapeutic Method – 2**
- 1.2 The Elastic K-Tape – 2**
 - 1.2.1 Acrylic Coating – 4
 - 1.2.2 Indicators of Poor Tape Quality – 5
 - 1.2.3 Tape with Active Ingredients – 5
- 1.3 Users and Fields of Application – 5**
- 1.4 Training for K-Taping Therapists – 6**
- 1.5 Crosstape – 6**
 - 1.5.1 Function and Properties – 6
 - 1.5.2 Application – 7
- 1.6 Basic Functions and Effects of K-Taping – 7**
 - 1.6.1 Enhanced Muscle Function – 7
 - 1.6.2 Elimination of Impairments to Circulation – 8
 - 1.6.3 Pain Reduction – 8
 - 1.6.4 Support of Joint Function – 9
- 1.7 Application and Removal of the Tape – 10**
- 1.8 Contraindications – 11**
- 1.9 Color Theory – 11**
- 1.10 Combined Therapy – 12**
- 1.11 Ground Rules for the Treatment of Children – 12**
- 1.12 Reference – 12**

After more than 15 years of development and use in practice, K-Taping therapy is well known to most therapists and many patients. However, many are not aware of the scope of its therapeutic spectrum. Most people connect K-Taping primarily with sport, since the red and blue tapes can be seen almost every weekend during football and other sports programs on television. K-Taping offers much more, however, and can also be exceptionally helpful in the field of physical therapy and many branches of pediatrics.

K-Taping functions primarily via the skin receptors and **proprioception**, influencing the muscles, fascia, ligaments, and nerves. In addition, a variety of application techniques can be used to stabilize joints and support the lymphatic system. Elastic K-tapes follow the path of a muscle or nerve, can be affixed to any part of the body, and do not restrict the patient's movements in any way. These benefits are not limited to adults and athletes, but can also be applied to children.

Every mechanical, dynamic, or physical process, particularly in the human body, is dependent on the interaction of all the components. Thus the smallest defective muscle can disrupt an entire functional chain and lead to pain, dysfunction, or misalignment at a completely different location in the body. Only when muscular strength, levers, and ligaments work in balance is the individual free from discomfort.

Particularly in children with handicaps, wider misalignments affecting the entire body may thus result from a single dysfunction, a single dysfunctional or unbalanced interplay. This type of dysfunction may be congenital, result from an injury sustained during birth (e.g., ► Sect. 3.3), or be caused simply by differences in muscle flexibility and/or muscle development on the opposing sides of a joint (agonist and antagonist). Added to the above are injuries that affect not only muscular balance, but also decrease protective reflex contraction. Edema and swelling also disrupt physiological movement patterns and lead to pain.

When the skin in an affected area is stretched prior to the application of K-Tape, both skin and tape form wave-like folds upon returning to the resting position. This lifting of the skin increases the space between the skin and subcutaneous tissue. Lymphatic fluid can drain into the lymphatic system more easily from this enlarged space, reducing irritation to pain receptors and facilitating the self-healing mechanisms of the body. Body movements continue to lift and lower the tissue, creating a pumping effect that stimulates lymphatic drainage and the circulation of blood.

Continual movement of the body ensures constant shifting of the skin by means of the K-Tape. The skin displacement produced in this way affects the **mechanoreceptors**, thereby **relieving pain**. This in turn improves

muscle function and supports ligaments and tendons. Noticeable improvements in posture are often apparent in children within a short space of time (► Sect. 1.11).

Specific K-Taping applications can influence the internal organs by means of the cuti visceral reflex arcs at the segmental level.

1.1 From Theory to Therapeutic Method

The concept of influencing **proprioception** via **skin receptors**, as a means to influence muscles, ligaments, and tendons and thereby the function of the body, is far older than the theory of K-Taping.

Many of the positive properties of K-Taping therapy that are recognized today were not the initial focus of its development. Efforts were originally made to influence proprioception and thereby muscle function using an elastic tape that did not restrict the patient's movement. Hence the name K-Taping therapy, derived from the Greek word **inesis = movement**.

For a long time predominantly **muscle applications** were tested and performed. Additional properties and treatment options were discovered through years of use and as a result of therapeutic successes and the continuing development of the K-Tape. Until the year 2000, the **K-Taping Academy** was still submitting questionnaires to patients after the first tape application, evaluating the results and using their conclusions to develop new applications and uses for K-Tape. Today, the academy conducts studies both in Germany and internationally, working with clinics and professional organizations for therapists, to discover new fields of application.

The initial therapeutic concept has expanded to include a wide range of applications, transforming K-Taping into a new and effective method with an unusually broad spectrum of therapeutic indications, which can be used to support other established treatment methods successfully. One major advantage of K-Taping therapy is that therapists and pediatricians can effectively provide patients with additional therapy to take home. Most therapeutic treatments stop at the end of the treatment session. K-Taping, on the other hand, continues to work as long as the child is wearing the application.

1.2 The Elastic K-Tape

The use of high-quality tape is vital for the successful implementation of K-Taping therapy. The tape must have highly specific properties, which can be maintained with consistent quality over several days and when placed under stress. The decisive factors are the **quality of the materials**



■ Fig. 1.1 Original K-Tape in four colors and K-Tape for me

and consistency of the manufacture. The **cotton fabric** must be woven at right angles, and the elastic fiber integrated into the weave must hold its **elasticity** for the entire period of wear, without weakening.

The elasticity of K-Tape can be compared with the **elongation capacity** of human muscles. The cotton fabric can only be stretched **longitudinally**, by approximately 30–40%. This is equivalent to an elongation capacity of 130–140%; in addition, the K-Tape is already stretched by 10% when attached to the backing paper. This capacity to stretch plays an important role in the respective application techniques.

Original K-Tapes are available in **four colors**: cyan, magenta, beige, and black (■ Fig. 1.1). However, the color-differentiated tapes have exactly the same properties: They do not differ in thickness, stretchability, or any other function. For background information on the four tape colors, see ► Sect. 1.9.

K-Tape is primarily used in roll form, for which a tape width of 5 cm has proved to be optimal. Wider tapes create problems during use, as the thumb must be held under the full width of the tape for the application, and the thumb frequently proves to be too short. Narrower tapes can be cut from the 5-cm-wide roll. K-Tape rolls are available in 5-m and 22-m lengths. When comparing prices it is worth noting that some suppliers also offer 4-m rolls, without clearly stating the shorter length.

As well as K-Tape rolls, **K-Tape for me** is also available. This is a selection of pre-cut applications for common indications, which can be self-applied using the accompanying instructions. K-Tape for me can be used by girls suffering from period pain or juveniles during sports, for example.

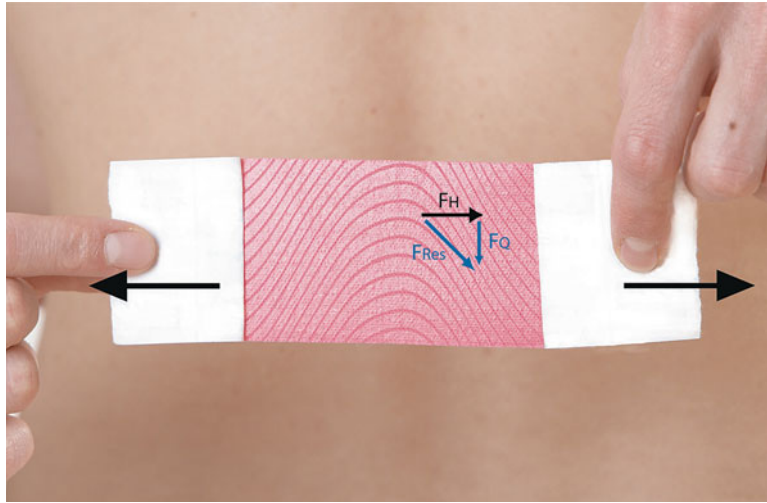
■ Fig. 1.1 shows the Original K-Tape and K-Tape for me. K-Tape is also available as pre-cut Lymphtape, as cut-

ting long strips during therapy can waste too much time (not shown here).

➤ **The water-resistant and breathable properties of K-Tape allow for a long period of wearability as well as a high level of comfort.**

Children can retain their mobility during treatment and participate without restriction in activities of daily living, such as showering, bathing, and playing sports. Certain demands are placed on tape quality in order for this to be the case. An increasing number of tapes have become available for K-Taping therapy, for the most part of **poor quality**, produced in China and other parts of Asia. More than 60 different types and brands of tape are currently on the market, although there are considerably fewer manufacturers than there are tape names. Many tapes with differing names are sold by a limited number of manufacturers, who market non-branded products in different packaging. The tape supplier has no influence over the quality of these products. The tape properties of these cheaper products vary constantly, as raw materials for production are acquired from different suppliers. It is sufficient for a single component to vary; if the cotton, acrylic adhesive, or backing paper changes, the properties of the tape change automatically.

Tapes that have no product name on the backing paper or packet, or which are printed with a name that differs from the name under which they were sold, frequently originate from mass producers who purchase raw materials from the cheapest source for reasons of economy, leaving the tape properties subject to fluctuation. The designation **»Kinesiology Tape«** is a common and unrestricted term for elastic tape in Asia. It is a general term covering tapes of varying quality. In many cases this name appears on the tape roll, although the product is sold under another name and packaging.



■ Fig. 1.2 Original K-Tape with acrylic coating in sine wave form

The range of products on offer is becoming increasingly unmanageable, and still more tape names are appearing on the market.

➤ **Every therapist should examine the materials offered closely and with a critical eye, as the success of the therapy and the patient's comfort depend on them.**

Many offers that appear to be good value turn out to be more expensive in the long run, when tape applications need to be renewed after only a short period of wear, elasticity and manufacturing quality do not stand up to demands, or the acrylic adhesive causes **skin irritation**. Since several applications can be made with a single roll of K-Tape, the possible saving per patient becomes questionable. No therapist should risk the quality of their therapy or the success of treatment for the patient in order to achieve a minimal saving.

Children in particular have significantly thinner and more sensitive skin than adults, making high-quality tape for their therapy the only valid option.

As an international certifying organization and partner in a number of research institutes, the Academy depends on the use of high-quality tape of consistent quality. The K-Tape used by the Academy is subject to **quality control** during production. Regular RoHS (restriction of hazardous substances) tests monitor the tape for impurities or heavy metals. The colors are manufactured in Germany and subject to Öko-Tex Standard 100 (an independent testing and certification system for textile raw materials as well as intermediate and end products). The tapes are also tested for their mechanical properties and the quality of the adhesive used (► Sect. 1.2.2). In terms of **mechanical prop-**

erties, the tests verify that the tape possesses the desired level of elasticity, and that it maintains that elasticity for the duration of the therapy.

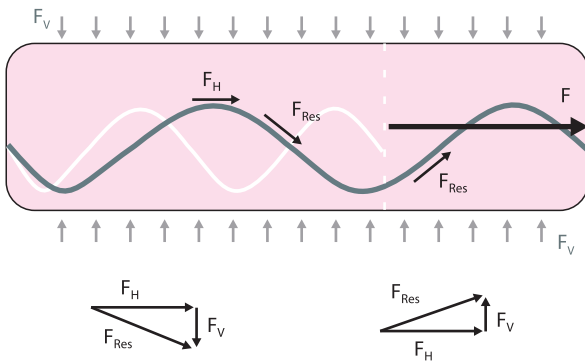
1.2.1 Acrylic Coating

Almost all tapes on the market are coated with acrylic adhesives of varying quality. Only K-Tape is coated with **Physiobond®**, a premium quality acrylic adhesive characterized by the purity of its production process, as well as the particularly time-consuming finishing process by which residual monomers, created during the production process, are removed as thoroughly as possible, as they may cause skin irritation and intolerances. This also guarantees the uniform adhesive properties of K-Tape.

The quality of K-Tape is verified using biochemical tests by SGS, the world's leading inspection, verification, **testing**, and certification company.

➤ **Tape with untested adhesive should not be applied to the skin of children and babies.**

The tape strips are woven in such a way as to permit elasticity only lengthwise. The tape cannot be stretched across. The desired effect of stretching laterally, elastic recoil in the transverse direction, is achieved by means of the acrylic coating, which is applied to the tape lengthwise in the form of a repeating **sine wave** (■ Fig. 1.2). The tensile forces follow the acrylic curves, thus breaking the forces down (F_{Res}) into a longitudinal component (F_H) and a lateral component (F_V). Depending on the extent to which the tape is stretched, this creates an accompanying lateral force distributed evenly across the length of the tape (■ Fig. 1.3).



■ Fig. 1.3 Force effect and force resolution

- **When combined with transverse force, the recoil force from the longitudinal elongation of the tape facilitates lifting of the skin and tissue, one of the fundamental effects of K-Taping therapy.**

1.2.2 Indicators of Poor Tape Quality

The quality of tape ultimately becomes evident through use. However, tape quality should of course not be tried out on patients, particularly children. Some factors and deficiencies in quality can easily be checked beforehand.

Direction of the Woven Cotton Fabric

The cotton fibers should be woven at right angles to each other. The longitudinal threads must run parallel to the tape edges. The fibers of some tapes exhibit a noticeable slant, running diagonally rather than parallel to the edge of the tape. The outermost threads of the fabric are severed at short intervals. The outer threads that are separated in this way lose the ability to transmit tension, and fraying of the fabric shortens the longevity of the application.

Differing Levels of Elasticity

The elastic fibers woven into the fabric lengthwise must possess very specific levels of elasticity and longevity. Differing levels of elasticity or a premature loss of elasticity become problematic when the tape is in use.

If the tape has a significantly **lower level of elasticity**, the effect of the application is altered and wearability and comfort are reduced.

The more elasticity is lost, the closer the tape comes to the restrictive form of being a »non-elastic tape.« Using non-elastic tape for a K-Tape application deprives the patient of mobility and with every movement, the muscle works against the fixed tape causing painful pulling of the skin or loosening the application. Tapes with less elasticity demonstrate the same **limiting qualities** in correspondingly reduced form.

If the tape has a significantly **higher level of elasticity**, the K-Tape application becomes ineffective or produces different results. The weaker an elastic thread is, the less recoil force it exerts through the fabric. Endlessly elastic tape has no recoil force at all, and therefore no effect.

Fluctuations in Tape Quality

Tape production demands continuous **quality control**, as is often the case with high-quality goods. Relatively minor changes in the manufacturing process, fluctuations in the quality of raw materials, uneven edges on individual rolls, or different storage of the completed products can mean that tape from a single manufacturer does not always exhibit the same properties. Different tape properties make the K-Taping therapist's job more difficult and have a negative effect on the treatment, the wearability of the tape, and the satisfaction of the patient.

- **Buying only tape of the best quality (e.g., K-Tape®) and staying loyal to a good product are recommended, rather than changing products constantly!**

1.2.3 Tape with Active Ingredients

- **K-Taping therapy does not require pharmaceutical ingredients! Providing treatment without medication is one of the fundamental advantages of K-taping and a strong argument in its favor, particularly when treating children.**

The use of tape products impregnated with chemical substances, ingredients, or unknown minerals for K-Taping therapy, particularly when treating children, is inadvisable. It is also not recommended to use products with cooling or painkilling menthol gels/sprays or painkilling salves in combination with K-Tape applications. A reaction with the acrylic adhesive cannot be ruled out, depending on the contents of the creams, gels, or sprays.

Ideally, the child's skin should be treated with **Pre-K-Gel** before treatment, to remove oil or residue from shower gels or other cleansers on the skin that might reduce the effectiveness of the tape. Ingredients such as aloe vera and green tea have an additional soothing effect on children's sensitive skin, adhesion and wearability are increased, and the desired mechanical effects (movement of the skin) are optimized.

1.3 Users and Fields of Application

For more than 15 years, K-Taping has been finding its way into many branches of medicine and physical therapy. This effective therapeutic method has become an integral

part of injury prevention and training therapy at world championships, Olympic Games, and in a wide spectrum of competitive sports ranging from football, handball, volleyball, and basketball to rugby, alpine sports, and gymnastics. Effective **aftercare** and **treatment plans** for the orthopedic, surgical, and even oncological fields have been developed and integrated in clinics and rehabilitation centers.

Today, the **range of applications** is broadly defined and will expand further in the coming years. It is an exceptional therapeutic tool not only for physical therapists but also pediatricians and practitioners in other medical specialties. Its applications in the field of neurology can be considered separately, along with those for gynecology and lymphatic therapy. In all cases, a solid training such as that offered internationally by the K-Taping Academy is a prerequisite.

1.4 Training for K-Taping Therapists

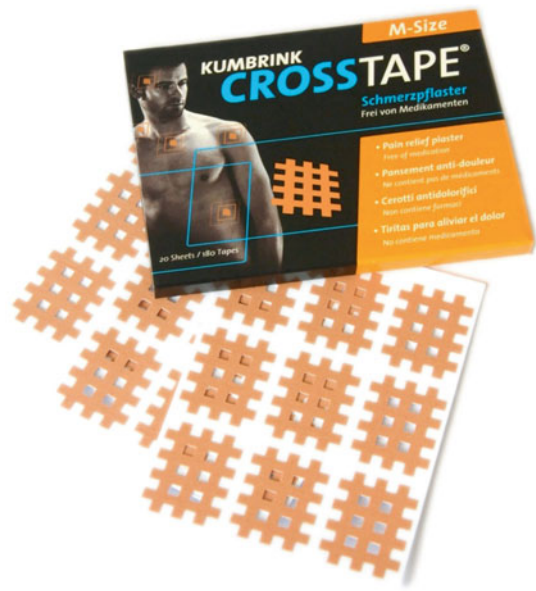
Alongside the development of K-Taping therapy itself, the establishment of a high-quality **international training system** with uniform standards is one of the K-Taping Academy's most important tasks. In Germany this system has been in development since 1998, and is now offered in more than 40 countries worldwide. The training provided by the K-Taping Academy is recognized by professional associations in several countries, and course participants receive continuing education credits or other benefits when taking part. The training of instructors and granting of certification takes place centrally through the K-Taping Academy in Germany.

Of particular interest is the inclusion of **country-specific treatment concepts**. This provides opportunities for a variety of new therapeutic approaches and exchange of experiences. The **international K-Taping Forum** (www.tapingforum.de) is available to graduates for this purpose.

Through its many partnerships with recognized training providers, the Academy has had the opportunity to integrate the differing experiences of other countries into its training and therapy.

The following **K-Taping courses** are currently being offered (info at www.k-taping.com):

- K-Taping Pro (Professional) – certification as a K-Taping Therapist
- K-Taping Gynecology
- K-Taping Ergotherapy
- K-Taping Podiatry
- K-Taping Pediatrics
- K-Taping Speech Therapy



■ Fig. 1.4 CROSSTAPE®

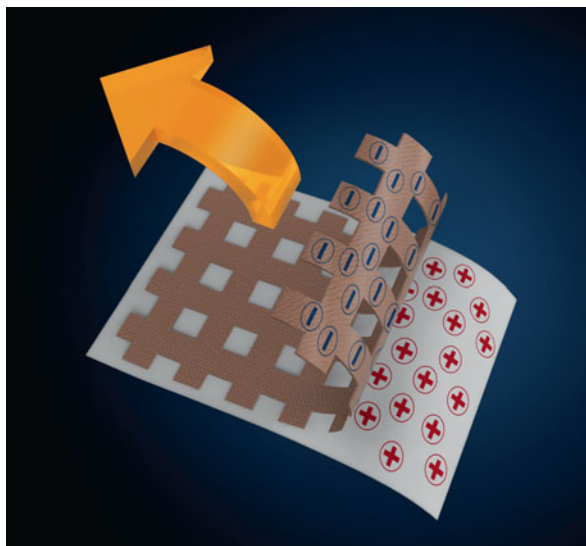
1.5 Crosstape

The following treatment examples refer to **Crosstapes**. Crosstapes are small lattice-like tapes, made of polyester and coated with acrylic adhesive (■ Fig. 1.4). Like K-Tapes, Crosstapes are free of medication or pharmaceutical substances and function entirely owing to their electrical charge. In many cases, Crosstapes can be successfully combined with K-Taping applications and for this reason Crosstaping is a fixed component of K-Taping training.

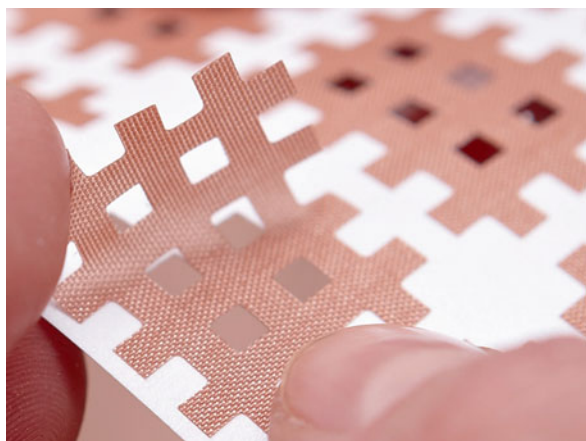
1.5.1 Function and Properties

Tiny electrical impulses are used to control many functions and much information processing within the human body. Whether it be muscular, fascial, or neural functions, or even acupuncture points, the body uses measureable electrical pathways and resistances. Crosstape is made of dual mixed fibers, attached to a specially coated backing paper. When removed from the backing paper, the tape becomes electrostatically charged. This means that the tape has an excess of electrostatic charge (■ Fig. 1.5) that it cannot discharge itself. The charged Crosstapes are then affixed to the skin where they slowly release this charge, thereby stimulating areas of pain and acupuncture points.

Injuries, diseases, scars, and muscle tension all affect the body's electrical conduction system and are communicated to the brain as signals of dysfunction and pain.



■ Fig. 1.5 Crosstape variant



■ Fig. 1.6 Removing the Crosstape

1.5.2 Application

Applying Crosstape is very simple. The Crosstape is carefully removed from the backing paper and remains stuck to one fingertip (■ Fig. 1.6). The Crosstape should be touched as little as possible, since the tapes may lose their electrostatic charge if repeatedly touched. If the tape is held approximately 1 cm away from the skin above an acupuncture or trigger point, it is often possible to see how the charged tape is drawn toward the oppositely charged area.

The tapes are applied directly over pain points, muscular trigger points, and acupuncture points. Depending on the stresses applied (such as showering, swimming, sport, or work), they can adhere to the skin for a period up to several days.

The quality of the Crosstape used is also critical to the success of the therapy. As with K-Tape, there are already imitations available that allegedly function in the same way. However, if the tapes do not charge correctly, or pieces of backing paper remain attached to the underside of the tape when it is removed from the backing, their effectiveness and longevity is lost.

1.6 Basic Functions and Effects of K-Taping

The basic functions and effects of K-Taping will be outlined in the following sections.

1.6.1 Enhanced Muscle Function

Applications for Muscle Injuries

Muscle injuries may range from sore muscles to strains and torn muscle fibers, or muscle rupture.

Overloading the muscular system can cause rupture of the **connective muscle tissue**. The resulting fluid in the interstitial space increases pressure, stimulating pressure and pain sensors. This results in pain, stiffness, swelling, and increased tonus.

Applications for Hypertonus/Myogelosis

An increased, reflexive state of **persistent tonus** leads to a **change in consistency** of the muscle. The entire muscle is usually affected, although the alteration can be confined to a local area. Causes include birth trauma, neurological disorders, or **trauma** caused by one-sided overload, e.g., due to misalignment or malfunction that causes a permanent increase in muscle tonus.

Applications for Muscle Shortening

Muscle shortening may be reflexive or structurally caused. The distinction is often blurred. Causes of **reflexive muscle shortening**, for example, may include:

- A protective reaction to pain
- Acoustic or optical stress factors
- Changes to structure caused by joint misalignments
- Coordination disorders that lead to incorrect movement patterns and dysbalances in the muscles involved
- Overloading of muscles due to misalignment/dysfunction

The same conditions that cause reflexive muscle shortening may eventually lead to reversible **structural shortening**.

Applications for Hypotonus/Decreased Resting Tonus

Hypotonus is usually caused by a reflex inhibition, due to a hypertonus of the antagonist, a pathological articular process of a joint, or paresis. The resulting impaired muscle activity leads to loss of strength and muscle atrophy.

Application for Impaired Muscle Activation

Within a short space of time, impaired muscle activation leads to **hypotrophy** and **atrophy**.

The cause is always **inactivity**, e.g., due to trauma with subsequent immobilization, diseases of the musculoskeletal system, lack of movement, or reflex inhibition due to defective articular processes of a joint. Complete atrophy only occurs with the interruption of nerve conduction.

The Effect of Muscle Taping

■ Change in Tonus

Tonus refers to a **level of tension** that is maintained by impulses from the central nervous system, as well as afferent signals from the periphery (joints, muscles, skin) via the **peripheral feedback system**. Skin receptors are activated by the tape, thereby strengthening the afferent signals from the periphery. This mechanism can be used to influence tonus regulation.

■ Assisting Muscle Control

Proprioception (deep sensitivity) orients the body in space. The position and movement of our joints is sensed by **mechanoreceptors**, and the proprioceptive afferents of the **mechanoreceptors** affect **control of postural motor function** (static) as well as **directed motility** (dynamic). These sensors are found in the joints, muscles, tendons, and skin. The proprioceptors in the skin are affected by the tape and in this way more information about positioning and loading of the extremity and the body is transmitted.

1.6.2 Elimination of Impairments to Circulation

Inflammation is often the body's reaction to **tissue damage**. In addition to the release of fluid in the affected area, inflammation leads to compressive swelling and increased pressure between the skin and musculature. Lymphatic flow is disrupted or stagnates. The K-Taping application can lift the skin in this area, enlarging the space and reducing pressure to facilitate lymphatic circulation.

1.6.3 Pain Reduction

Nociceptors are the basis for our **sense of pain**. They are free nerve endings found in the **dermis**, occasionally penetrating into the **epidermis**. They are distributed fairly evenly across the surface of the body, and play a crucial role in the skin's function as a protective layer for the organism.

Nociceptors can also be found in the muscles, internal organs, and in every type of tissue found in the body with the exception of the outermost layers of the articular cartilage, the nucleus pulposus of the spinal discs, the brain, and the liver.

Nociceptors react to thermal, mechanical, and chemical stimuli. The transmission of nociceptive signals occurs via the **myelinated A γ fibers** on the one hand, which trigger the **first pain** sensation (bright, sharp, piercing) owing to their rapid stimulus transmission, and via the **unmyelinated C fibers** on the other, which transmit signals more slowly and therefore trigger the **second pain** sensation (dull, burning, boring, or tearing). The »first pain receptors« are densely distributed in the skin, the »second pain receptors« in the joint capsules, ligaments, tendons, and internal organs.

The **nociceptive afferents** are switched to a second neuron in the dorsal horn, and relayed onward via diverging synaptic connections. The first filtering and influence of the incoming **nociceptive** and **proprioceptive signals** takes place at the spinal level before they are transmitted cranially, although the »important« information, e.g., nociceptive afferents for the superordinate centers (cortex, brain stem), is always transmitted.

The nociceptive afferents coming into the **dorsal horn** come from the joints, musculature, skin, and internal organs. Afferents also run from the cortex and brain stem to the dorsal horn. These central **descending pathways** can be inhibiting as well as channeling.

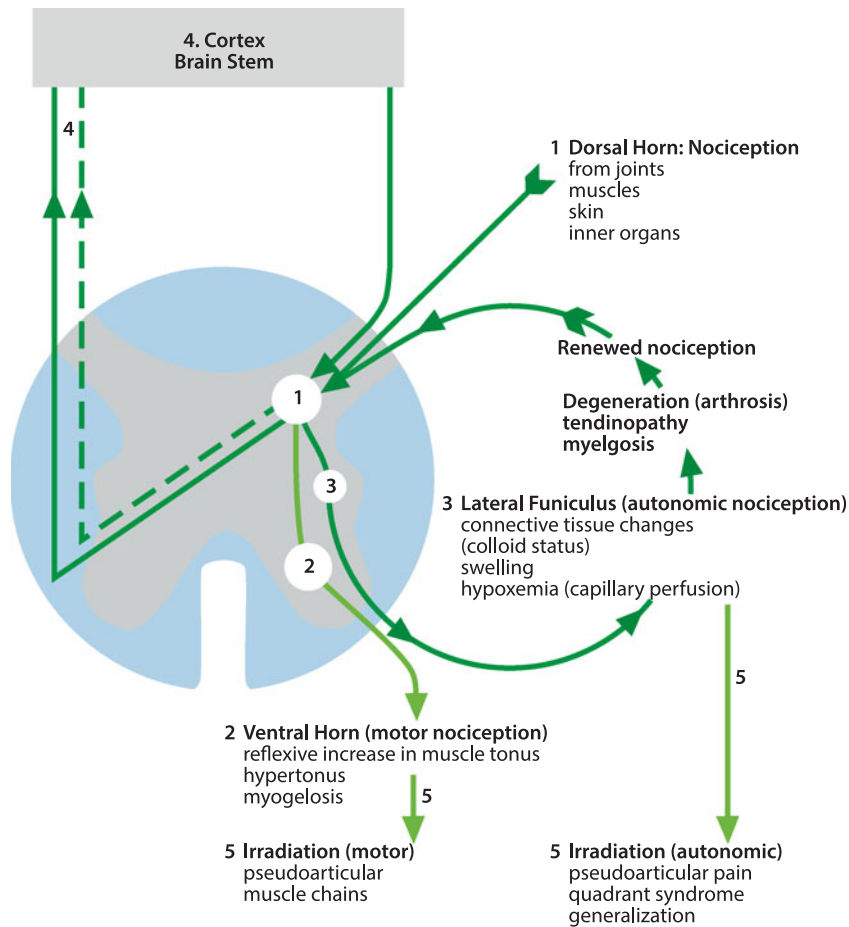
The nociceptive afferents are passed on to the **ventral horn** and the **lateral horn**. The **motor nociception** takes place in the ventral horn:

- Reflexive increase in muscle tonus
- Hypertonus
- Myogelosis

Autonomic nociception takes place in the lateral horn:

- Changes to connective tissue
- Swelling
- Hypoxemia (capillary perfusion)

Degeneration (arthritis), tendinopathy, and myogelosis cause repeated nociceptive afferent signals to the dorsal horn. This causes motor and autonomic radiation; motorically, this leads to **pseudoradicular radiation** and radiation into the muscle chain. Autonomically, it causes **pseu-**



■ Fig. 1.7 Transmission of nociception and the process of nocireaction. (From Frisch 2009)

doradicular pain, quadrant syndrome, and generalization (■ Fig. 1.7).

The first nocireaction to a high-threshold nociceptive afferent takes place at the spinal level.

The adhesion of the K-Tape to the skin and the resulting mechanical displacement caused by body movement stimulate the mechanoreceptors in the skin. Like the nociceptive afferents, these proprioceptive afferents also run to the dorsal horn and inhibit the transmission of nociception.

1.6.4 Support of Joint Function

Joints are moveable connections between bones. The capsule–ligament apparatus and musculature contribute to the control of joint movement. The mobility of a joint is dependent on the shape of the joint as well as the surrounding structures (musculature, ligaments, capsule).

There are several causes of movement disorders at a joint:

- Damage to joint surfaces caused by arthritis or arthrosis, with shrinking of the capsule–ligament apparatus resulting from poor posture or incorrect loading
- Dysbalances in the muscles surrounding a joint
- Obstructions, e.g., the menisci in the joint
- Nocireactions from other structures external to the joint

Joint function can be supported using a variety of K-Tape applications.

Imbalances can be corrected by influencing muscle tonus, so as to restore balance to the muscle group.

➤ **A better sense of movement can be facilitated by stimulating proprioception.**

Like passive supports, **functional** and **fascia-correcting applications** improve joint function, alleviating pain and speeding up the healing process.



■ Fig. 1.8 K-Taping scissors

1.7 Application and Removal of the Tape

During its manufacture, the K-Tape is affixed to the backing paper with a slight stretch of 10%. This existing tension should be maintained during the application of the tape strips.

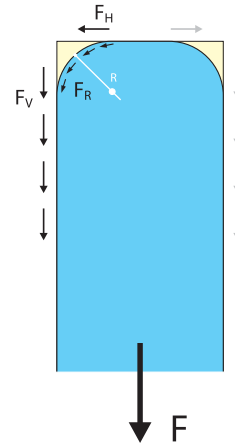
- The application is referred to as **unstretched**, despite the existing prestretch.

Depending on the type of application, the tape is affixed unstretched or with different levels of tension. The tape strips are cut to the required length before the tape is affixed and the backing paper removed. In this way **I**-, **Y**-, and **X**-tapes are created, as well as **fan-shaped** and **narrow individual strips** for lymphatic therapy.

Specially designed **K-Tape Scissors** (bivax K210 and bivax K160 scissors; ■ Fig. 1.8) are recommended and can be helpful. The cutting edges are coated to prevent the acrylic adhesive entering the pores of the metal (as with conventional scissors), thus avoiding sticking and blunting of the cutting edges.

With few exceptions, K-Taping applications begin with the affixing of a **tension-free base**, usually approximately the width of two fingers. From this base, the tape strips are affixed with the required level of stretch or tension, leaving another two-finger-wide portion at the end of the tape, which is again attached unstretched.

The corners of the tape strips should be **rounded off** with scissors. Together with the application of an unstretched base and ends, this prevents **premature loosening** or unwanted curling of the tape ends. It is almost impossible to prevent pointed corners from becoming detached.



■ Fig. 1.9 K-Tape with the corners rounded

A certain tension on the tape ends due to pulling and movement of the skin cannot be avoided. The **longitudinal tensile forces** are distributed »around the corner.« This is referred to as **redistribution of force**.

- If the opportunity is available, forces flow optimally around the radius.

This opportunity is supplied by the tape. In other words, tensile forces flow in an arc to the boundary of the tape end (■ Fig. 1.9). Thus, unrounded, pointed corners (shown in yellow) would remain tension free. The **limit state** between the **flow of force** and the **tension-free tape** causes the corners to lift slightly. If they then come into contact with clothing or with a towel during drying, the tape is more easily detached.

In this way, the K-Taping application can be worn for considerably longer. Care should also be taken that the tape strips are not be rubbed dry with a towel after bathing or showering, but are patted dry instead. Rubbing often causes the tape ends to roll, as the adhesive sticks to the towel.

To optimize durability and adhesion, **Pre-K Gel**, developed specifically for K-Taping therapy, is applied to the skin (■ Fig. 1.10). Pre-K Gel ensures better adhesion, even on oily or slightly sweaty skin, and also contains a mild disinfectant.

Extreme heat, such as with infrared treatment, fango (medicinal clay pack), or direct and powerful external heat sources can cause **skin irritations**. In the case of children, it is therefore doubly important that care be taken not to dry the application with a hairdryer after bathing or showering.

- The skin must be dry and free from oil; preliminary treatment with Pre-K Gel is optimal. It is equally important that any heavy hair growth be removed beforehand.



■ Fig. 1.10 Pre-K Gel

In the case of children, the issue of hairiness reducing the application's effectiveness does not arise as frequently as with adults. However, there are children who have strong hair growth at a comparatively early age. Minimally hairy skin presents less of an obstacle during application and removal of the tape (sensory stimuli).

Heavy hair growth should definitely be removed, however. A **wet razor** should not be used, as it may cause **small skin lesions** or **irritation**, which may lead to itching beneath the tape once the K-Tape is applied. **Hair clippers** or **electric trimmers** are preferable, as they trim the hair sufficiently without damaging the skin.

➤ **The therapist should rub the application several times with the flat of the hand after completion, in order to activate the heat-activated adhesive properties. The relevant part of the body should remain in a pre-stretched position during this process.**

Pre-K Gel is recommended for parts of the body that quickly become moist (hands, feet), as sweating is suppressed for a period of time. In addition, a **separate anchor** (extra tape strip) can be affixed diagonally without stretch over the tape end.

K-Taping applications can be **removed** relatively painlessly if the tape is wet, e.g., in the shower or bath. The ideal method is to roll the tape off using the palm of the hand. Rubbing the tape with baby oil beforehand can also make removal easier.

Shortly after application, skin metabolism beneath the tape is stimulated by the **improvement in blood circulation**. The acrylic adhesive also develops its **full adhesive**

strength during the first hours and bonds with the skin. Particularly during training courses, some participants react with mild skin reddening when the tape is removed after only a few hours or the next day.

The reason for this is that the skin is freshly stimulated and the adhesive holds well. It is possible that the part of the topmost layer of skin is removed along with the tape, which does not happen after several days of wear as the skin renews itself. The tape should not be removed abruptly from sensitive areas such as the crease of the elbow or back of the knee, as this may damage the skin. The tape should be left for longer on the sensitive skin of children and particularly babies, as it becomes easier to remove with each day that passes (skin renewal).

➤ **Slight reddening of the skin fades quickly and does not represent a contraindication.**

1.8 Contraindications

No **side-effects** of K-Taping have been discovered to date. However, K-Taping applications should be avoided for the following **contraindications**:

- Open wounds
- Unhealed scars
- Parchment-like skin, e.g., neurodermatitis or acute episodes of psoriasis
- Known allergies to acrylic

Although it is rare in children, it is important to check beforehand whether the child to be treated is taking **anti-coagulant medication**. Small skin **hemorrhages** may occur as a reaction to the K-Taping application. Experience has shown that **cardiac patients** taking anticoagulants occasionally react to K-Tape applications with itching and weals.

The backing paper is sprayed with silicone to facilitate removal of the cotton tape from the paper. Although minimal, small amounts of silicone residue may stick to the adhesive. Silicone is usually used to make tapes gentler to the skin. However, some patients react to silicone with slight reddening of the skin.

1.9 Color Theory

K-Tape is available in four colors: **cyan**, **magenta**, **beige**, and **black**.

It is worth noting at this point that the decisive element is the correct application technique, and that the colors themselves play a purely complementary role in the treatment. There is no difference in properties or structure between the tapes, and they have identical levels of elasticity.

The colors can be chosen according to the principles of **color theory** to have a supporting effect during the therapy. According to this theory, the color **red** is perceived as activating and stimulating, the color **blue** as calming. **Beige** and **black** are considered neutral. The patient's preference is usually the deciding factor when working with the children, however.

1.10 Combined Therapy

In the pediatric field, K-Taping is seen as a useful complement to physical therapy, and is often used in combination with therapeutic methods such as Bobath or Vojta. It can also be combined with treatment using orthotics.

1.11 Ground Rules for the Treatment of Children

The following ground rules apply to K-Taping for children:

- The K-Taping application should always be made in consultation with the attending physician, and parents should be made aware of how the application should be treated, i.e., effects, care and removal.
- Pre-K Gel should always be applied before treatment.
- Children should avoid bathing for at least 4 h following the application, to ensure optimal bonding of the adhesive with the skin.
- A hairdryer should not be used to dry the tape application after bathing or showering.
- The therapist should remove the tape the first time, to check for possible skin alterations and observe any changes to posture.

We have achieved and documented many positive therapeutic outcomes in recent years. Out of consideration for the children involved, however, it was decided to recreate the examples for this book using exclusively models.

The therapist is frequently able to treat the original cause or disability and shorten the duration of therapy, which can be stressful for the child; less misalignment means less concomitant treatment. Reducing treatment time and improving quality of life for the child by means of effective therapy should always be the first objective of the therapist.

Reference

Frisch H (2009) Programmierte Untersuchung des Bewegungsapparats, 9. überarb. u. erw. Aufl. Springer, Berlin Heidelberg

The Four Application Techniques

Birgit Kumbrink

2.1 Muscle Applications – 14

- 2.1.1 Muscle Function – 14
- 2.1.2 Effect of the K-Tape Application – 14
- 2.1.3 Application Technique for Muscles – 14

2.2 Ligament Applications – 16

- 2.2.1 Applications for Ligaments (Ligamenta) – 17
- 2.2.2 Ligament Application for Tendons – 21
- 2.2.3 Spacetape – 23

2.3 Corrective Taping Applications – 25

- 2.3.1 Functional Correction – 25
- 2.3.2 Fascial Correction – 27

2.4 Lymph Applications – 28

- 2.4.1 Causes of Lymphostasis – 29
- 2.4.2 Effects of Lymph Application – 31
- 2.4.3 Application Technique for the Lymphatic System – 31

2.1 Muscle Applications

Muscle applications are used in cases of **increased** or **decreased resting muscle tone** (hypertonus, hypotonus) or injuries to the musculature, and have a normalizing effect on resting muscle tone, alleviating pain and improving resilience to speed the healing process.

Muscle applications are affixed using 10% tape tension. As the tape is already pre-stretched to 10% on the roll, this is referred to as an unstretched application. The patient is placed in a **pre-stretched position**, and the tape is affixed to the relevant body part, with 10% pre-stretch. Depending on the type of application used, the K-Taping treatment can have a toning or detoning effect.

During K-Taping training, students are taught that a **tonus-stimulating application** should be affixed running from the muscle origin in the direction of its insertion. A **tonus-reducing effect** is produced by affixing an application in the opposite direction, running from insertion toward the origin of the muscle. However, origin and insertion may alter depending on muscle movement and function, and in some cases muscle applications may be applied in contradiction to the above rule. The classic representation of muscle origin and insertion as prescribed points does not allow for this »alternative« approach, and can lead to misunderstandings among some therapists during the training process and in practice.

The characterization of muscle function using the terms **punctum fixum** (fixed end) and **punctum mobile** (mobile end) is useful, as the fixed and mobile ends may be reversed according to the action of the muscle.



Tip

Tonus-stimulating applications are attached from punctum fixum to punctum mobile, tonus-reducing from punctum mobile to punctum fixum.

This ground rule should be followed for all diagnoses and the muscle application affixed accordingly.

As in previous publications, and in accordance with K-Taping training, this book will use the terms **origin** and **insertion**. In cases where punctum fixum and punctum mobile deviate from the designations of muscle origin and insertion, this fact will be referred to specifically when describing the muscle application.

As described in ► Sect. 1.7, muscle applications begin with the attachment of a **tension-free base**. The base is affixed using the hand (pressed against the body), with the skin stretched (**skin displacement**). Tonus-stimulating applications are affixed in the direction of the origin (punctum fixum), tonus-reducing applications in the direction of the insertion (punctum mobile). Skin displacement

should stretch the skin as far as possible, without causing the patient pain.

2.1.1 Muscle Function

When performing a movement the muscle contracts, drawing the insertion of the muscle toward the muscle origin, or the punctum mobile toward the punctum fixum as explained in ► Sect. 2.1. Muscle, fascia, and skin also shift in the same direction.

2.1.2 Effect of the K-Tape Application

In the case of a **tonus-stimulating muscle application**, the **resilience** of the elastic tape creates traction in the direction of the muscle origin (punctum fixum), which also shifts the skin toward the fixed base of the tape. This **facilitates muscle contraction**.

With a **tonus-reducing application**, the tape resilience creates traction in the direction of the muscle insertion (punctum mobile) and toward the fixed base of the tape, shifting the skin in the same direction. This **decreases muscle contraction**.

2.1.3 Application Technique for Muscles

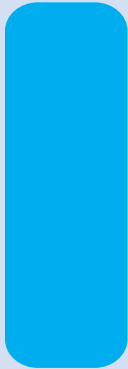
- Measure the required tape strips against the patient, with the muscles in a pre-stretched position (■ Fig. 2.1a).
- If necessary, cut the tape strips into the required form (e. g., Y-tape).
- Cut tape ends into a rounded form.
- Place the patient in a comfortable position.
- Affix the base (■ Fig. 2.1b).
- Position the patient so that the relevant muscles are pre-stretched.
- With one hand, the therapist attaches the base with skin displacement (■ Fig. 2.1c).
- Affix tape strips along the length of the muscle using the other hand, with 10% tension.
- Rub the tape strips while the muscle is pre-stretched.



■ **Fig. 2.1a–d** Muscle application. **a** Measure the tape with the muscle pre-stretched, **b** affix the base with the muscle at normal length, **c** apply the tape to the pre-stretched muscle, **d** completed muscle application

Memo

- The muscle application is affixed with **10% tape tension**.
- The patient is positioned with the muscle in a pre-stretched position.
- Predominantly **I- and Y-tapes** are used.



Blue I-tape



Red Y-tape

2.2 Ligament Applications

Ligament applications are utilized for injured and strained ligaments (lat.: ligamentum, plural: ligamenta) and tendons. The same technique can also be used to treat **localized pain, trigger points, or spinal segments**. Ligament applications provide support, alleviate pain, and improve resilience to promote faster healing and shorten the period of rehabilitation. The term »ligament application« is therefore not a full description of the numerous benefits for which the technique has become known.

Ligament applications are affixed with **maximum tape tension**. As with muscle applications, the tape ends are attached unstretched to increase the longevity of the application. When making applications to ligaments, the relevant joint should be positioned with the ligaments under tension. Applications for tendons are applied with the muscle fully stretched, and pain points are treated with the patient's **body in an elongated position**.

There are two techniques available, depending on whether ligaments, tendons, or pain points are to be treated (► next section).

Ligaments and tendons are structures loaded with **sensors** that play a crucial role in joint and muscle function. Afferents in the skin and subcutaneous tissue supplement **proprioceptive sensitivity** (proprioception) and attenuate the pain impulse (**nociceptive afferents**). K-Taping therapy makes use of these relationships to influence movement of the body through stimulation of the skin.

2.2.1 Applications for Ligaments (Ligamenta)

This application technique is utilized for ligaments that connect two adjacent bones, e.g., the collateral ligaments of the knee joint. The tape is affixed **en bloc** (French: as a whole).

The backing paper is torn down the middle and partially removed, leaving only a two-finger-wide area of paper attached at each end (to provide the base). As one piece, the tape is then affixed over the ligament and its insertion onto the bone, using **maximum stretch**. The joint should be positioned with the ligaments under tension. Following this, the remaining backing paper can be removed, and the tape ends attached without tension.

➤ **Care should be taken that the joint is initially positioned to create maximum stretch of the skin, so that joint movements do not create tension on the tape ends following the application. This ensures that the tape ends will remain tension-free through the full range of joint motion.**

Ligament Function

Ligaments connect two adjacent bones. They are placed under tension or relaxed according to the position of the joint, and function to **stabilize and guide the joint**. Except for the ligamenta flava connecting the vertebral laminae, ligaments can only be minimally stretched. They contain numerous **nerves** and **mechanoreceptors**, allowing them to perform a broader role than simple mechanical support and direction of the joint. They provide **information** about the position of the joint, its movements, and speed of motion. In addition, ligaments register stretch and pain. Together with the joint capsule and muscles, the mechanoreceptors contained in the ligaments play a role in **regulating joint motion**, as capsular tension, movement, and **joint pressure** can be measured continuously and information transmitted via the respective spinal segment to the muscles surrounding the relevant joint. The muscles react and adapt to the current situation constantly.

Effect of the K-Tape Application for Ligaments

The initial attachment of the tape en bloc using maximum tension, followed by the attachment of the bases, allows the tape to be anchored simultaneously to both insertion points at the bone.

In this way, the tape pulls toward the center of the ligament. This supports the ligament mechanically, as joint motion places the tape under equal tension to the ligament itself. The displacement of the skin toward either the base or center of the tape, depending on the position and movement of the joint, also creates a **sensory stimulus** that affects muscle function as previously described.



Fig. 2.2a–e Application for ligaments. **a** Measure the tape strips, **b** attach the tape strips en bloc, with maximum tension, **c** attach tape ends with the joint positioned at end of range, **d** attach the tape ends, **e** completed ligament application

Application Technique for Ligaments

- Position the joint with the ligament under tension.
- Measure the tape length from insertion to insertion (■ Fig. 2.2a).
- Cut the tape strips and round the tape ends.
- Tear the backing paper down the middle and remove, leaving the paper attached to the bases at either end of the tape.
- With maximum stretch, affix the tape en bloc to the ligament structure (■ Fig. 2.2b).
- Position the joint at the end of range (max. skin stretch) (■ Fig. 2.2c).
- Remove backing paper and affix tape ends (■ Fig. 2.2d).

Memo

- The tape application for ligaments is affixed en bloc, with maximum stretch.
- The joint is positioned with the ligaments under tension.
- **Only I-tapes** are used.



Red I-tape



Fig. 2.3a–d Ligament application for tendons. **a** Measure the tape strip in the pre-stretched position, **b** attach the base in a resting position, **c** affix the tape strip in the pre-stretched position, **d** completed tendon application

2.2.2 Ligament Application for Tendons

In this technique the application is affixed over tendons and tendinous structures, including the musculotendinous junction and osseous insertion.

In contrast to the technique for ligaments, an **un-stretched base** is first affixed over the osseous insertion. The joint to be treated is then placed in a pre-stretched position. In this position, the base is fixed using the hand, and **skin displacement** is performed in the direction of the length of the tendon, and in the opposing direction to the pull of the tape. Lastly, the tape is affixed over the length of the tendon structure, with maximum stretch. The tape end is attached to the musculature without tension.

This application technique causes the tape to pull toward the base, displacing the skin in the same direction.

Tendon Function

In contrast to ligaments, which are attached to two bones, tendons have only one point of attachment to bone; the opposing end of the tendon is joined to the fascia of a muscle. They transfer **contractile forces**, caused by contraction and gravity, from muscle to the bones. They also contain receptors known as **Golgi tendon organs**; these measure the amount of muscle tension exerted on the osseous insertion of the tendon, and provide **protection from overloading**.

Effect of the K-Tape Application for Tendons

Tendon applications allow the K-Tape to affect tendons, fascia, and muscles. Mechanical support of tendon function and the stimulation of receptors (afferents in the skin and subcutis) via skin displacement are significant, in addition to the effect on muscle tonus (► Sect. 2.1) and the displacement of fascia in the direction of the base.

Application Technique for Tendons

- Place the muscle and thereby the tendon in a pre-stretched position; if the patient is unable to achieve this position independently, the therapist may assist the movement **without causing pain**.
- Measure the tape in the pre-stretched position, from insertion to the musculotendinous junction (■ Fig. 2.3a).
- Cut the tape strips and round off the ends.
- Place the muscle in a resting position, and attach the tape base at the point of insertion (■ Fig. 2.3b).
- Place the muscle in the pre-stretched position.
- The therapist holds the base with one hand and displaces the skin (■ Fig. 2.3c).
- Affix the tape with maximum tension along the length of the tendon, as far as the musculotendinous junction.

- Place the remaining tape end over the muscle and attach without tension.
- With the muscle still in the pre-stretched position, rub the application.

Memo

- The ligament application for tendons is affixed from insertion to the musculotendinous junction, with **maximum tension**.
- The patient is positioned with the muscle pre-stretched.
- Only **I-tapes** are used.



Red I-tape



Fig. 2.4a–d Spacetape application. **a** Measure the tape strip, **b** affix the first tape strip, **c** affix the second tape strip at a 90-degree angle to the first, **d** completed Spacetape application

2.2.3 Spacetape

The term *Spacetape* describes an application utilizing tape strips of equal length, affixed over a single point in a cross or star form. As with the application for ligaments, each tape is attached en bloc with maximum tension. Usually, **four tapes are applied in star form**. Once the first tape is affixed, the second tape is applied at a 90-degree angle across the center of the first, forming a cross. The third and fourth tapes are subsequently affixed at 45-degree angles over the initial cross.

The application is used for **pain points** and **trigger points**, **spinal segments**, **connective tissue massage zones** and across the **sacroiliac joint (SIJ)**. The tape length can be halved, depending on the size of the area to be treated or when treating children. Tape strips are generally between 15 cm and (in the case of an application to the back) 20 cm in length, and will need to be even shorter for smaller treatment areas such as the elbow. In special cases, fewer than four strips may be used.

Effect of Spacetape

The Spacetape creates a **localized raising** of the skin, thereby releasing tissue adhesions. Patients describe the effect of the star-shaped application as similar to the **action of a suction cup**, with a palpable lifting of the adhered structure. As the name suggests, the Spacetape provides the damaged structure with more space, effecting a **decrease in pain**. Spacetapes can also be used for the mobilization of connective tissue.

Application Technique for Spacetape

- Place the body in a pre-stretched position.
- Measure and cut the tape strips (rounding tape ends;  Fig. 2.4a).
- Tear the backing paper down the middle and remove, except for the length required for the base at each end.
- Affix the tape en bloc with maximum stretch, at the site to be treated ( Fig. 2.4b).
- Using the same method, attach the second tape strip at a 90-degree angle to the first ( Fig. 2.4c).
- Place the third and fourth strips at 45-degree angles to the tape cross ( Fig. 2.4d).
- Rub the application in the pre-stretched position.

Memo

- Spacetape is a space-creating application for **pain points and trigger points**.
- The application is made with **maximum tension**.
- The body is placed in a pre-stretched position.
- Only I-tapes are used.



Red I-tape



Fig. 2.5a–f Functional corrective application. **a** Measure the tape strip, **b** base is placed on the vastus medialis muscle, **c** fix the base of tape 1 and attach the first tail strips in an upward direction, **d** affix the second tail strip moving upward from tape 2, **e** fix the base of tape 2, and attach the first tail strip moving upward from tape 2, **f** completed corrective patella application in the resting position

2.3 Corrective Taping Applications

Corrective applications can be separated into applications for **functional correction** and **fascial correction**. The functional corrective application is used for osseous malalignments, e.g., patellar malalignment, and effect a **shift in position** of the bony structure. Fascial corrective applications are used to treat muscle fascia adhesions, creating a **release of the fascia** as well as **decreasing pain**.

2.3.1 Functional Correction

Applications for functional correction are always affixed over osseous structures, as their function is to correct the position of the bones. **Y-tapes** are most commonly used. The base is firmly anchored with skin displacement, and the two tail strips affixed over the structure to be corrected. Functional corrective applications are attached with **maximum pre-stretching** of the tape. The adjustment is thus made in the direction of the base. This must be taken into account when attaching the base. When making applications to joints, the tail strips are affixed during movement. In other cases such as the spine, however, they are attached when pre-stretched. It is important to note that for functional corrective applications, the tape tails of the Y-tape should be affixed separately, one after the other.

Causes of Osseous Malalignment

In most cases, osseous malalignments are a result of asymmetric or over-use of the musculature, muscle tension, atrophy, or congenital misalignments. In all cases malalignments lead to **disharmony of the musculature**, causing dysbalances between agonists and antagonists. If they affect **functional processes**, osseous malalignments may also trigger one-sided muscle loading (e.g., an external trauma and subsequent compensatory posture resulting in dysfunctional movement patterns).

Effect of Applications for Functional Correction

Two modes of action are combined in applications for functional correction: firstly, a **slight mechanical adjustment** achieved through skin displacement and secondly, **sensory stimulus** to the interrelations of the muscle-tendon system involved.

Application Technique for Functional Correction

- Measure the tape over the structure to be corrected (■ Fig. 2.5a).
- Cut the tape strips and round the tape ends.
- **Tape 1:** Affix the base while the patient is in the resting position (■ Fig. 2.5b).

- Attach the base with maximum skin displacement in the direction of the desired adjustment.
- Affix tail strip 1 over the structure to be corrected, with maximum tension (■ Fig. 2.5c).
- Attach the tape end (tail strip 1) unstretched, with the joint in maximal position or pre-stretched.
- Affix tail strip 2 in the same way (■ Fig. 2.5d).
- **Tape 2:** Moving upward, affix tail strip 2 with maximum tension, over the structure to be corrected.
- Attach the tape end (tape strip 1) unstretched, with the joint in maximal position or pre-stretched.
- With the knee in full flexion, attach tail strip 2 over the patella without tension (■ Fig. 2.5e).
- Rub the application in the pre-stretched position.

Memo

- Attach the base firmly, with skin displacement.
- The application is affixed with **maximum tension**.
- Via the tape strips, the correction is made in the direction of the base.
- Primarily **Y-tapes** are utilized for functional correction, although **I-tapes** may also be used.



Red Y-tape

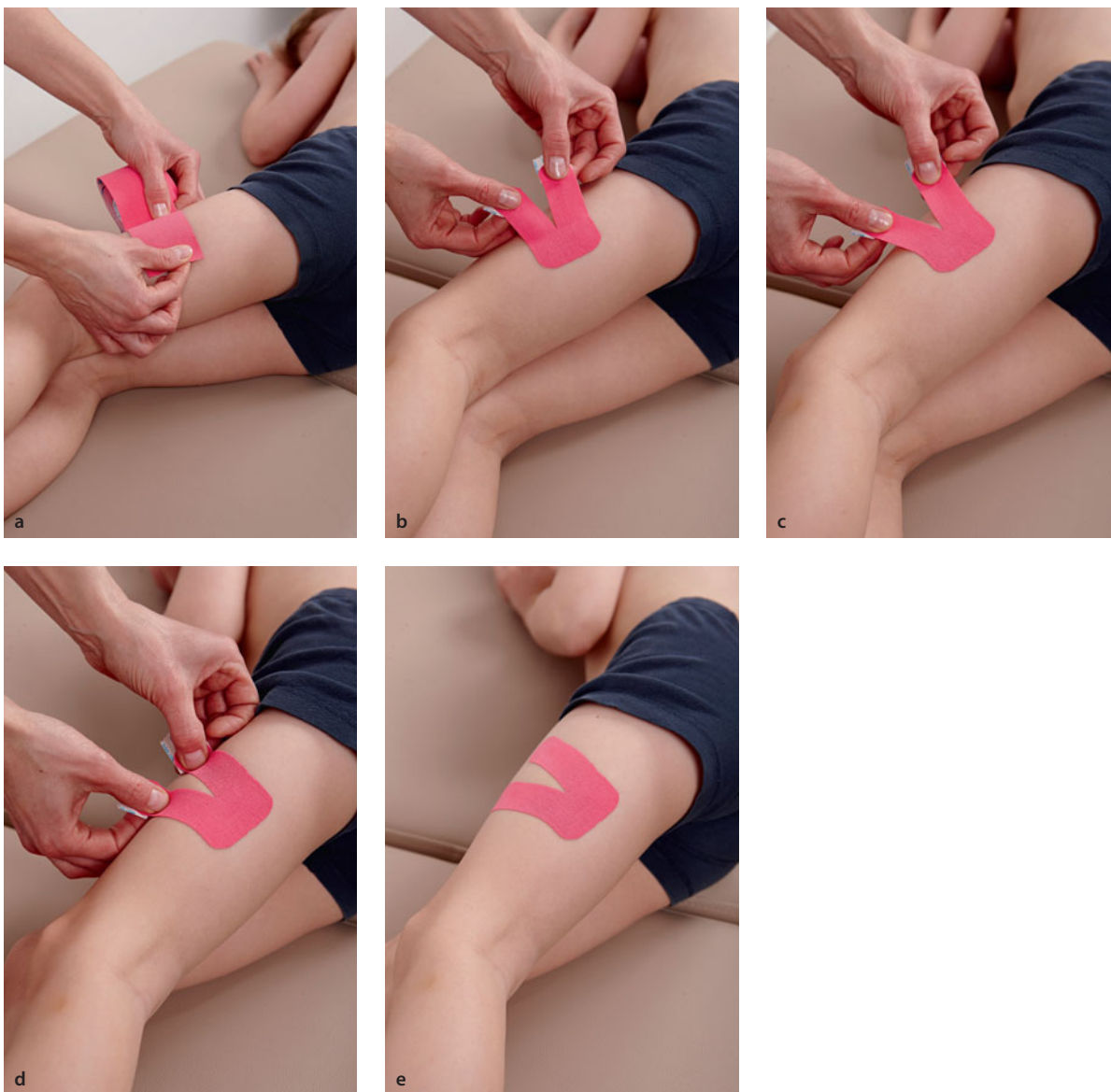


Fig. 2.6a–e Fascial correction. **a** Measure the tape at a right angle to the length of the muscle, **b** attach the base in front of the pain point, **c** pull the tail strips rhythmically, **d** affixed stretched tail strips with unattached, unstretched tape ends, **e** completed fascia correcting application

2.3.2 Fascial Correction

Fascia-correcting applications are used for adhesions of the muscle fascia, and completed using **Y-tape**. In contrast to applications for functional correction, both tail strips are attached simultaneously. The base is not anchored, but is drawn by the parallel tail strips, thereby shifting the pain point. In terms of the direction of movement, the base is located in front of the pain point. The direction in which the fascia can more easily be shifted should be established by the therapist beforehand. This is the direction in which the tail strips will be moved when affixed. In contrast to previous application techniques, the tape is affixed rhythmically rather than with an even tempo. Using this **pulsing motion**, the tail tapes are affixed slowly and with maximum tension. This does not refer to the maximal stretch of the tape fibers themselves, but to the **threshold** that can be applied over the structure. This can be the overlapping of skin folds, for example. Once the limit has been reached, the tape strips are affixed. The tape ends are also attached without stretch. During the application of the taping, the patient is in a resting position. A pre-stretch in the area of the joint is only necessary when attaching the tape ends.

In some cases, the fascia-correcting technique may also be used as a substitute for functional correction, if a more subtle adjustment is desired. In this case, an I-tape is used instead of a Y-tape, and the tape strips are attached evenly with variable tension, rather than rhythmically. The movement of the base is the deciding factor here.

Causes of Fascial Adhesions

Fascial adhesions can be caused by tension, one-sided strain, and overuse of the musculature.

Effect of the Fascia-Correcting Application

The movement of the base causes a mechanical displacement of the fascia. Manual tests are used to establish the position of the base and the direction in which the fascia can be moved freely. As a result of the fascial application, the muscle fibers work continuously against the fascia during movements of the body. This results in a gradual loosening and breaking down of adhesions.

Application Technique for Fascial Correction

- Test the movability of the fascia.
- Measure the tape in the rest position (■ Fig. 2.6a) and cut the Y-tape (rounding the ends).
- Affix the base in front of the pain point (■ Fig. 2.6b).
- Apply rhythmic traction to the tail strips up to the threshold, thereby displacing the base (■ Fig. 2.6c).
- Attach the stretched tail strips (■ Fig. 2.6d).
- Attach the unstretched tape ends.

Memo

- The patient is in a resting position.
- The **pulsing stretching technique** can be used with up to maximum stretch, but the limits of the structure should be respected.
- The base is not anchored.
- The adjustment occurs in the direction of the tension provided by the tape strips.
- The fascia-correcting application utilizes **Y-tape**.
- Functional correction is also possible using an **I-tape**.



Red Y-tape

2.4 Lymph Applications

Lymph applications may be used for **disorders of the lymphatic system**. The application effects a lifting of the skin, enlarging the space between the skin and subcutaneous tissue and stimulating the **lymph collectors** to resume normal functioning. The collectors are the active vascular transport system of the human body. Within this transport system, valves prevent a backflow of lymph and ensure central drainage. The vessel between two valves is referred to as **lymphangion** or also as **lymph heart**, and contracts to drive the lymphatic fluid onward.

When this lifting of the skin is combined with movements of the body, it also allows the skin and the tissue beneath it to be stretched. As a result, fibrous bands can be loosened or their formation prevented.

In the case of lymphatic applications, a fundamental differentiation is made between:

- An intact lymph node chain
- Partially or completely removed lymph nodes

■ Intact Lymph Node Chain

Applications to intact lymph node chains usually utilize tapes cut into four long thin strips, with a common base.

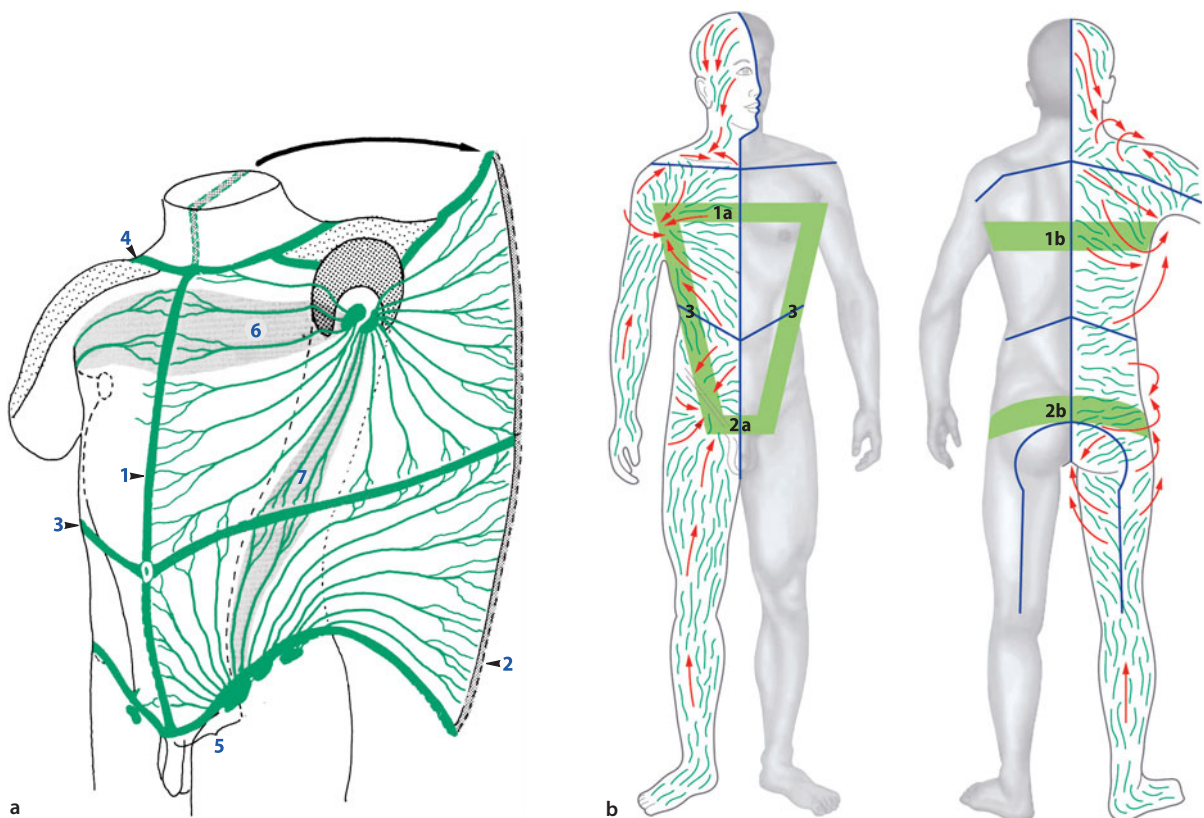
The common base creates an **area of low compression**, providing the lymph with a clearly defined direction of drainage.

■ Defective Lymph Node Chains

Applications can also be used for defective lymph node chains, but **individual tapes** cut into narrow strips are used more often in this case. When applied to the extremities, the long thin strips are affixed radiating outward from the area to be drained, and the broader drainage area and **connective effect** upon the tissue have the advantage of preventing **fibrosis formation**.

When applying K-Tape to an intact lymph node chain, attention must be paid to **anatomical watersheds** (■ Fig. 2.7).

Watersheds are areas with **few lymphatic vessels**, which separate the individual lymph node groups from each other (tributary region = drainage region of the lymph



■ **Fig. 2.7a,b** Superficial lymphatic vascular system with therapeutically significant watersheds, **a** ventral and dorsal overview, 1 ventral vertical watershed, 2 dorsal vertical watershed, 3 transverse watershed, 4 clavicular watershed, 5 seat of the pants watershed, 6 ventral interaxillary anastomosis, 7 axillo-inguinal anastomosis; **b** diagram of the trunk wall showing watersheds and direction of lymphatic drainage, anastomotic pathways illustrated in green, 1a ventral interaxillary anastomosis, 1b dorsal interaxillary anastomosis, 2a ventral interinguinal anastomosis, 2b dorsal interinguinal anastomosis, 3 axillo-inguinal anastomosis. (© Fa. Pascoe, with kind permission)

node). However, watersheds are not insurmountable barriers, as the network of valveless lymphatic capillaries covers the entire body. Watersheds are also bridged by **pre-lymphatic channels** (joining blood capillaries and lymph capillaries). At certain points on the trunk, links between the larger lymph vessels connect **collectors** from adjacent **territories** (interaxillary anastomoses in the area of the sternum and the scapula between the right and left axillae, and axillo-inguinal anastomoses in the flank area between axilla and groin).

The location of the watersheds gives rise to **four lymph territories** in the trunk region, also referred to as **quadrants**:

- Two horizontal watersheds, one at the height of the navel, the second at the level of the clavicles.
- One watershed running vertically with the central axis of the trunk.
- The so-called seat-of-the-pants **watershed** at buttock level delineates the dorsomedial and dorsolateral thigh regions.

In the case of an **incomplete lymph node chain**, the K-Tape application utilizes the lymph capillaries and pre-lymphatic channels in addition to the anastomoses, allowing the **accumulated lymph** to be transported to a healthy quadrant where the lymph nodes are intact.

2.4.1 Causes of Lymphostasis

Edema may have various causes and can be divided into high-volume insufficiency (dynamic insufficiency), low-volume insufficiency (mechanical insufficiency), and safety valve insufficiency.

High-Volume Insufficiency

There are healthy lymph vessels present and a normal transport capacity of the lymphatic system in cases of high-volume insufficiency. However there is a greater **lymph obligatory load** (quantity of lymphatic fluid) than available capacity for transportation. This causes **extracellular edema**.

There can be many reasons for this, e.g., trauma or organic disease. Trauma may cause lymph vessels to be damaged and in cases of organic disease, heart (chronic venous insufficiency– Stage I, CVI I) and kidney (hyperproteinemia) disorders are most commonly involved. An excess of fluid is caused by **differences in pressure**. The organic disease must first be brought under control medically before a K-Tape application can be considered.

High-Volume Insufficiency

- Healthy lymphatic vessels.
- Normal transport capacity.
- The lymph obligatory load (»lymphatic fluid« or net filtrate) is, however, greater than the body is currently able to transport.
- **Result:** fluid collects in the tissue, resulting in extracellular edema.

Low-Volume Insufficiency

In cases of low-volume insufficiency, diseased lymphatic vessels and a **limited transport capacity** can be observed, although the lymph obligatory load remains within normal range. The resulting lymph edema requires treatment.

The cause may be **primary** or **secondary lymph edema**:

- Primary lymph edemas are due to congenital developmental disorders or damage to the lymphatic vessels or lymph nodes.
- Secondary lymph edemas arise when lymphatic vessels and lymph nodes are damaged, usually by tumors, surgery, or radiation, and the majority of cases in which K-Tape lymph applications are used fall into this category.

Low-Volume Insufficiency

- Diseased lymphatic systems
- Reduced transport capacity with normal accumulations of lymph obligatory load
- **Result:** lymph edema forms, necessitating treatment



Fig. 2.8a–f Lymph application with a common base. **a** Measure the tape strip; depending on the width of the arm all four strips may be used, or one strip divided into smaller parts, **b** affix the base at the crook of the arm, **c** completely remove the tape backing and affix the end lightly, **d,e** place the joint in the pre-stretched position, affix the base with skin displacement, detach the tape strips one after the other and apply with 25% tension across the dorsal forearm, **f** completed application to the dorsal forearm

Safety Valve Insufficiency

Safety valve insufficiency is a response to long-term, undiagnosed, or untreated high-volume insufficiency, which decreases transport capacity. Lymphangions are forced to work excessively, and pressure within the lymphatic vessels is too high (lymphatic hypertension). The resulting **valve insufficiency** causes **mural insufficiency**, eventually leading to a hardening of the lymphatic vessels (lymphangiosclerosis). In extreme cases, cells in the affected area may die.

In such cases, K-Tape lymph applications can support additional therapies such as manual lymphatic drainage and compression treatment.

Safety Valve Insufficiency

- Diseased lymphatic vessels
- Decreased transport capacity with increased lymph obligatory load
- **Result:** valve insufficiency, mural insufficiency, lymphangiosclerosis, cell death in the affected area

2.4.2 Effects of Lymph Application

The tape elasticity and pre-stretched position of the body during application result in a **lifting of the skin**. The hypodermis is drawn toward the skin surface, causing the **initial lymph valves to open**.

The resistance of the adhesive tape against the patient's skin during everyday movements causes friction between the connective tissue and the epidermis. The connective tissue is loosened, increasing mobility of the filaments between the endothelial cells of the **lymphatic capillaries** (initial lymphatic vessels) and of the elastic fibers of the connective tissue. The valves of the initial lymphatic vessels are able to open more easily, allowing lymph to drain more rapidly. Accumulations of protein can be more easily broken down and **fibrosclerotic changes** delayed or prevented.

The tape has an additional **channeling effect**. Fluid flows along predetermined channels, stimulated by differences in pressure. The attached tape strips cause alterations in the pressure within adjoining tissues, thereby determining the direction of flow. The K-Tape ensures a more rapid flow of lymph, following the affixed channels in the desired direction.

The three **tape effects** described create a basis for **continuous lymphatic drainage** during the period in which the tape is worn.

Tape Effects That Facilitate Continuous Lymphatic Drainage

- Creating space by lifting the skin
- Loosening of connective tissue through body movements against the resistance of the tape
- Channeling effect of the tape

2.4.3 Application Technique for the Lymphatic System

Lymph Application with a Common Base

- Measure the required tape strips with the patient in a pre-stretched position (■ Fig. 2.8a).
- Cut the tape strips lengthwise into four equal parts.
- Round off the tape ends.
- Place the patient in a resting position.
- Affix the base (■ Fig. 2.8b).
- Remove the tape backing completely, and attach the ends lightly (■ Fig. 2.8c).
- Place the patient in the position required to stretch the joint.
- The therapist fixes the base with one hand and displaces the skin.
- Detach the tape strips one after the other using the other hand, and distribute them evenly across the treatment area with 25% tension (■ Fig. 2.8d,e).
- Attach the tape ends without tension.
- Rub the tape carefully while in the pre-stretched position.

Memo

- The lymphatic application is attached with **25% tape tension**.
- The patient is in a pre-stretched position.
- Only fan tapes are used.

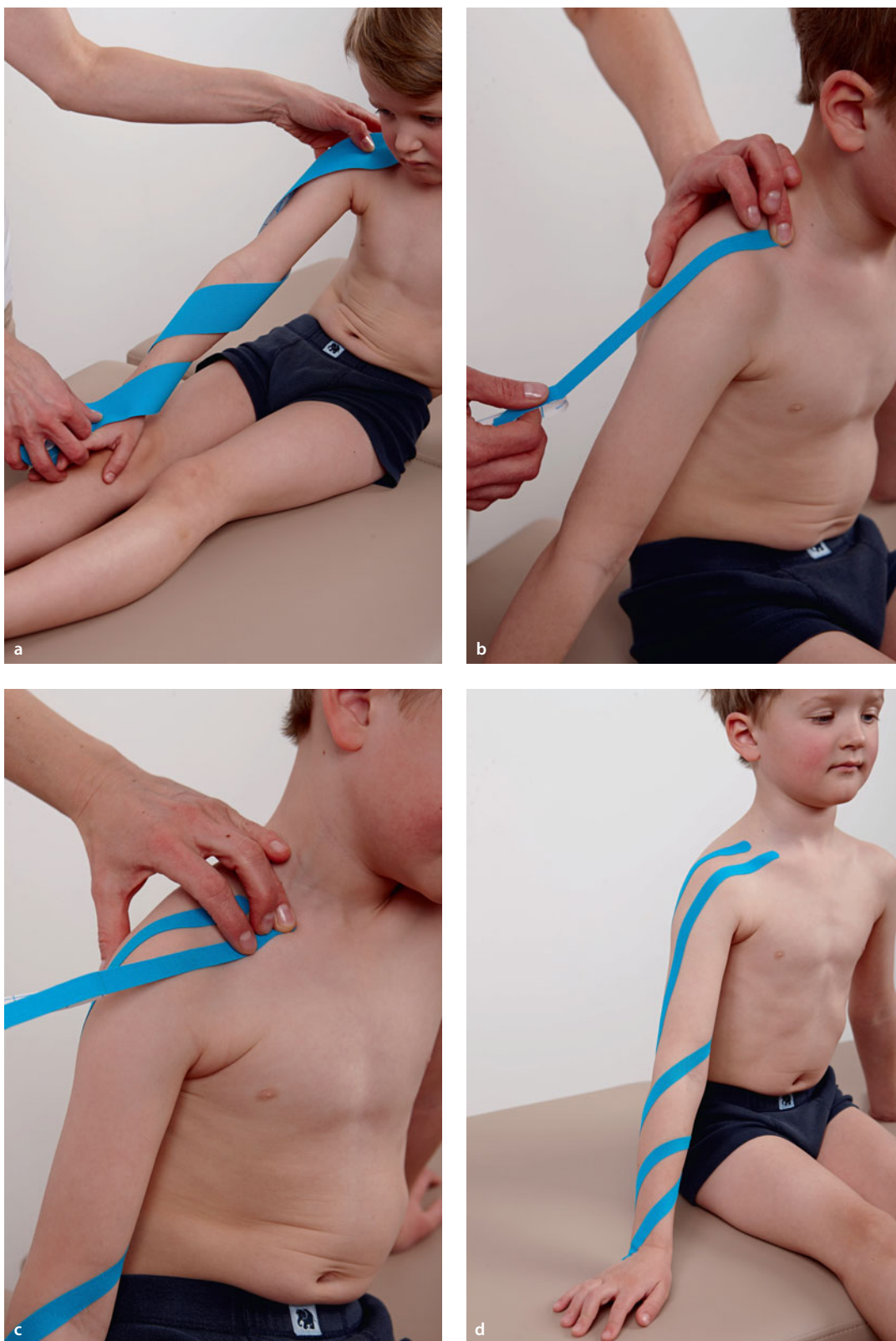


Fig. 2.9a–d Lymph application with individual I-tape strips. **a** Measure the tape strips in a spiral around the arm, **b** affix base at the supraclavicular fossa; always remove tape backing gradually; pre-stretch the extremity, **c** affix the base with skin displacement and attach the tape strips without tension, moving radially around the extremity, then carefully rub the tape strips, **d** completed application

Lymph Application with Individual Quartered I-Tape Strips

- The tape length is measured in four or five spirals around the extremity (■ Fig. 2.9a).
- Cut the tape strips longitudinally into four equal parts.
- Round off the tape ends.
- Place the patient in a resting position.
- Affix the base.
- Always remove the tape backing gradually during the application (■ Fig. 2.9b).
- Slightly abduct the extremity.
- The therapist fixes the base with one hand and displaces the skin.
- Apply the tape strips radially around the extremity, without tension (■ Fig. 2.9c).
- Carefully rub the tape strips.

Memo

- The lymph application is affixed **without tape tension**.
- The patient is in a resting position.
- Only **I-tapes** are used.

Applications for Specific Indications

Birgit Kumbrink

3.1 Postural Defects and Disorders – 39

- 3.1.1 Ventral Postural Disorder in Infants – 39
- 3.1.2 Ventral Postural Disorder in Young Children – 43
- 3.1.3 Three-Month Colic – 45
- 3.1.4 Umbilical Hernia – 47
- 3.1.5 Postural Disorders in Older Children – 49
- 3.1.6 Hyperextension of the Knee (Genu Recurvatum) – 53
- 3.1.7 Misalignment of the Knee Axis – 57
- 3.1.8 Asymmetry of the Cervical Spine – 59
- 3.1.9 Scoliosis – 63

3.2 Deformities of the Foot – 67

- 3.2.1 Metatarsus Adductus – 67
- 3.2.2 Flat Foot (Talipes Valgus) – 77
- 3.2.3 Spastic Sickled Foot – 79
- 3.2.4 Club Foot – 83
- 3.2.5 Talipes Calcaneus – 87

3.3 Brachial Plexus Palsy – 89

- 3.3.1 Scapula Alata – 89
- 3.3.2 Elbow Extension Deficit – 91
- 3.3.3 Shoulder Internal Rotation – 93
- 3.3.4 Forearm Pronation – 95
- 3.3.5 Palmar Flexion Posture – 97

3.4 Infantile Cerebral Palsy – 101

- 3.4.1 Spastic Thumb-in-Palm Deformity – 101
- 3.4.2 Spastic Hand Deformity – 103
- 3.4.3 Spastic Talipes Equinus – 105

3.5 Spina Bifida – 107

- 3.5.1 Inactive Musculature – 107
- 3.5.2 Scar Tissue – 109

3.6 Scar Treatment – 111

3.7 Disorders of the Knee – 115

- 3.7.1 Osgood–Schlatter Disease – 115
- 3.7.2 Patellar Misalignment – 117

3.8 Pulmonary Disease – 119

3.9 Dysphagia – 121

- 3.9.1 Swallowing Disorders – 121
- 3.9.2 Hypersalivation – 123
- 3.9.3 Hypotonus/Hypertonus
of the Mouth Region – 125

3.10 Myofunctional Disorders – 129

- 3.10.1 Shortened Upper Lip – 129
- 3.10.2 Open Mouth Posture – 131

3.11 Headaches – 133

3.11.1 Tension Headache – 133

3.11.2 Temporal Headache – 139

3.12 Sinusitis – 141

3.12.1 Sinusitis Maxillaris – 141

3.12.2 Sinusitis Frontalis – 143

3.13 Childhood Incontinence – 145

Reference – 145

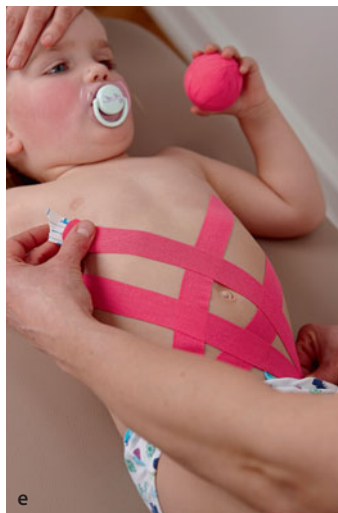
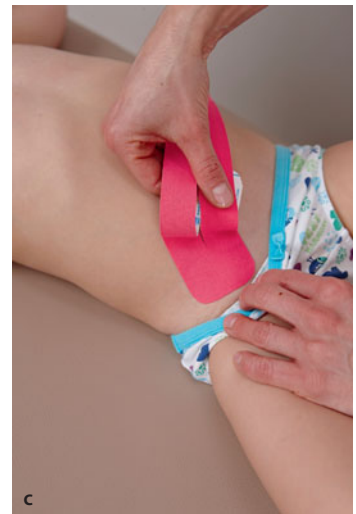
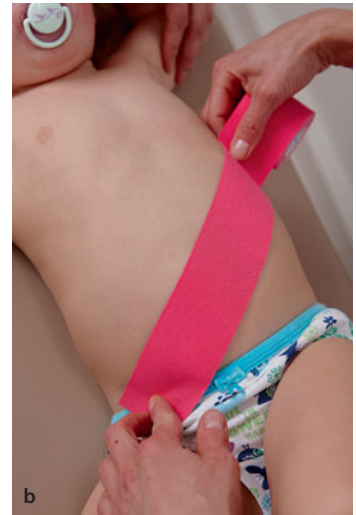
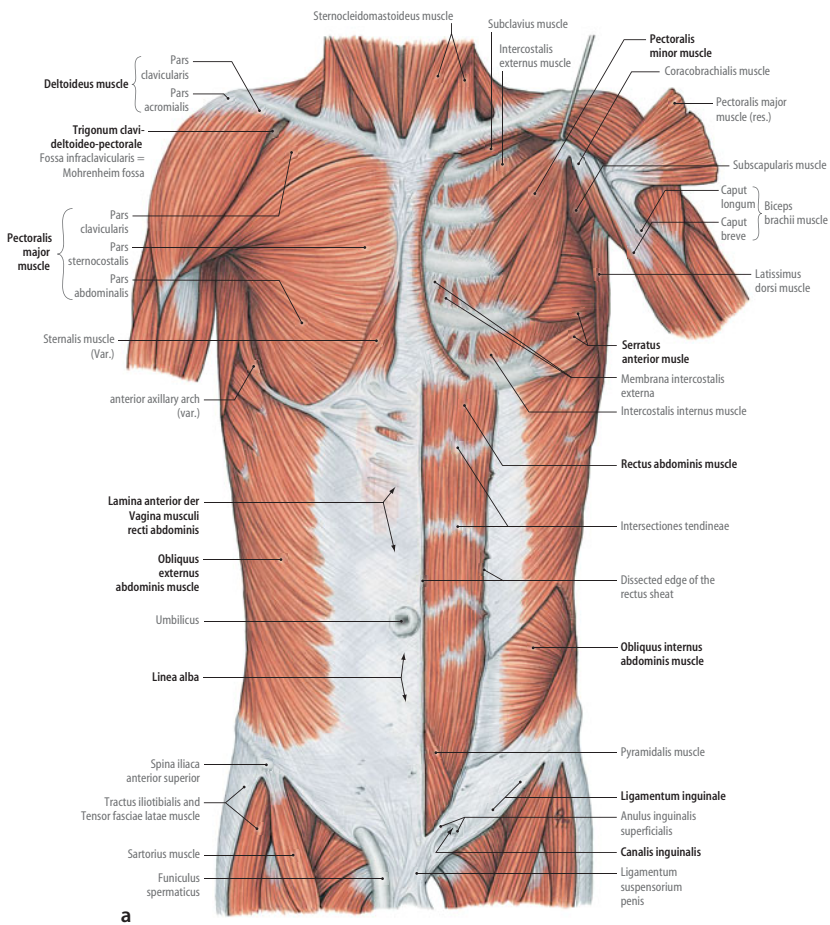


Fig. 3.1a–f Toning application to the m. obliquus internus and externus. **a** M. obliquus internus and externus. (From Tillmann 2010). **b** Tape measurement with the muscle pre-stretched, **c** base at the left anterior superior iliac spine (origin), **d** affix the base and attach the first tape strip, **e** affix the base and apply the second tape strip, **f** completed muscle application

3.1 Postural Defects and Disorders

3.1.1 Ventral Postural Disorder in Infants

Weakness of the muscles of the abdominal wall in infants causes widening of the costal arch and ventral tilting of the os ilium.

Rib Integration

■ Goal

Integration of the ribs using a bilateral tonus-stimulating application to the functional chain of the m. obliquus internus and externus (■ Fig. 3.1a). Base affixed at the pelvis.

■ Application

The tape strips are measured with the child in a supine position. Both legs are bent and rotated to the left side, the right arm is placed in flexion. The tape length extends from the anterior superior iliac spine to beyond the contralateral costal arch (■ Fig. 3.1b).

Two tapes of equal length are cut into Y-tape form.

With the child in a resting position, the first base is affixed to the right anterior superior iliac spine (■ Fig. 3.1c).

The legs are rotated to the right, the trunk to the left in order to pre-stretch the muscle. Affix the base with skin displacement, then use 10% tape tension to apply the upper tape tail above the navel and the lower tail beneath the navel, extending well beyond the right costal margin (■ Fig. 3.1d). Attach the tape ends unstretched. Rub the tape while in the pre-stretched position.

The second base is affixed to the left anterior superior iliac spine, in the resting position.

Once more, the muscle is pre-stretched and the application is repeated in the same way, with the second tape affixed to the m. obliquus internus and externus on the opposite side of the trunk (■ Fig. 3.1e).

■ Fig. 3.1f illustrates the completed bilateral tonus-stimulating muscle application.

Memo

Application: Muscle technique

Cutting technique: Y-tape



Red Y-tape



Tip

The navel is left uncovered for reasons of hygiene.

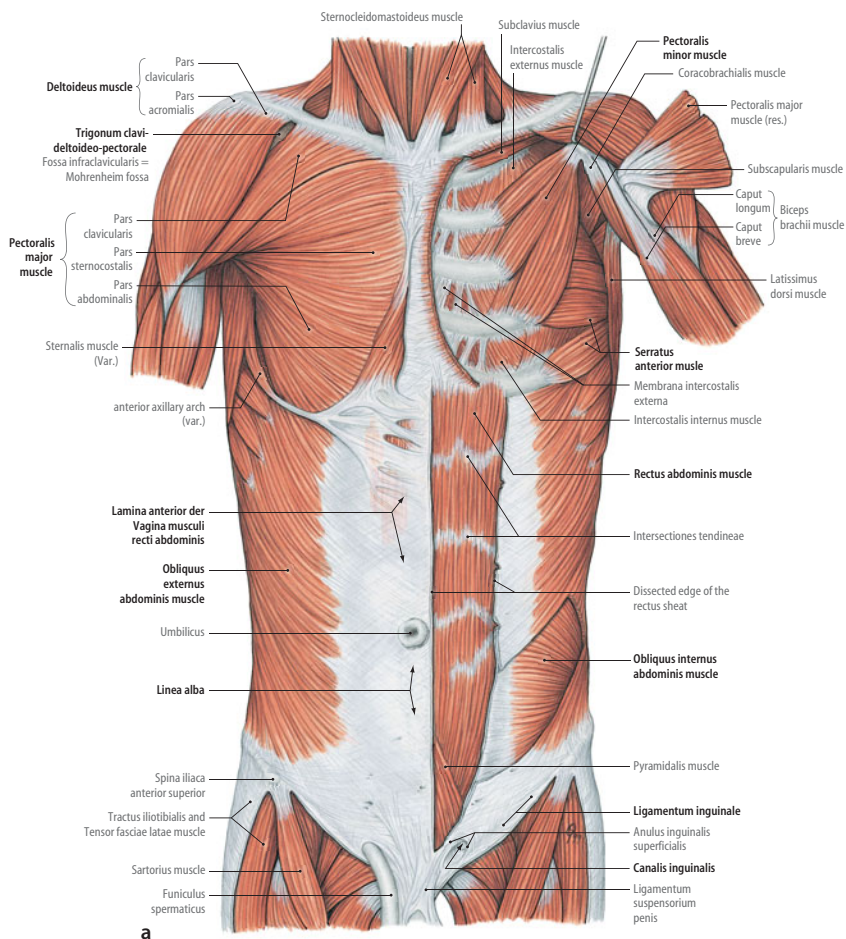


Fig. 3.2a–f Tonus-stimulating application to the m. obliquus internus and externus. **a** M. obliquus internus and externus. (From Tillmann 2010). **b** Base with hole affixed over the navel, **c** affix the base with skin displacement and attach the first strip over the costal arch, **d** affix the base with skin displacement and attach the second strip, extending as far as the anterior superior iliac spine, **e** completed unilateral muscle application, **f** completed bilateral muscle application

Rib and Pelvic Integration

■ Goal

Rib integration and pelvic integration using a bilateral tonus-stimulating application to the functional chain of the m. obliquus internus and externus (■ Fig. 3.2a). Base at the navel.

■ Application

The tape strips are measured with the child in a supine position. Both legs are bent and rotated to the left side, the right arm is placed in flexion. The tape length extends from the left anterior superior iliac spine to beyond the contralateral costal arch on the right side of the body.

Cut two tapes strips of equal length (I-tapes).

The first tape strip should be folded in the middle and a small triangle cut out. The base of the tape strip is affixed with the hole aligned over the navel, leaving the navel free (■ Fig. 3.2b). The muscle is elongated during measurement of the tape (► »Rib Integration«). First affix the base below and in the direction of the right anterior superior iliac spine, using skin displacement; the upper tape strip is then applied with 10% tension, over the muscle belly and extending over the left costal arch (■ Fig. 3.2c). Attach the tape ends unstretched.

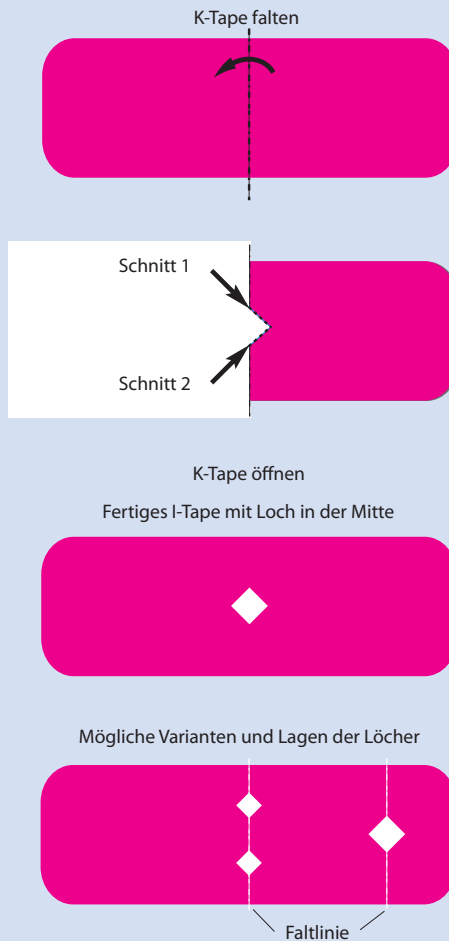
Once again, affix the base with skin displacement in the direction of the left costal arch, and apply the lower tape strand with 10% tension over the muscle belly and across the right anterior superior iliac spine (■ Fig. 3.2d). Attach the tape ends unstretched. ■ Fig. 3.2e illustrates the completed unilateral muscle application.

Repeat the taping process in reverse with the second tape strip to complete the application. ■ Fig. 3.2f illustrates the completed bilateral muscle application.

Memo

Application: Muscle technique

Cutting technique: I-tape with central hole



Instructions for the I-tape with central hole and variations

! Tip

Holes are frequently made too large, as the tape is subsequently stretched. Therefore, keep the hole small initially, and enlarge later if necessary.



The navel is left uncovered for reasons of hygiene.



Fig. 3.3a–h Tonus-stimulating application to the m. transversus abdominis. **a** M. transversus abdominis. (From Tillmann 2010). **b** Measure tape strip with the muscle pre-stretched, **c** affix base at the level of L 2–3, **d** affix the base with skin displacement, and attach the first strip at the level of the iliac crest, **e** attach the base of the second tape strip on top of the first, **f** affix the base with skin displacement and apply the tape strip extending horizontally to just short of the navel, **g** affix the Y-tape ends around the navel, **h** completed bilateral tonus-stimulating muscle application

3.1.2 Ventral Postural Disorder in Young Children

Weakness of the muscles of the abdominal wall in young children results in ventral tilting of the os ilium and hyper-extension of the lumbar spine.

■ Goal

Stabilization of the trunk by means of a tonus-stimulating application to the m. transversus abdominis (■ Fig. 3.3a).

■ Application

Part 1: With the trunk in lateral flexion and the arm abducted on the side to be taped, the Y-tape strips are measured along the iliac crest, from the lumbar spine to two finger widths beyond the linea alba (■ Fig. 3.3b). Cut the tape into Y-tape form. In a resting position, affix the base next to the navel at the level of L 2–3 (■ Fig. 3.3c). The muscle is pre-stretched and the base attached with skin displacement. Then affix the lower tape strip with 10% tension at the height of the iliac crest and over the linea alba, attaching the tape ends unstretched (■ Fig. 3.3d). With similar tape tension, the second strip at costal arch level extends over the linea alba, and the tape ends are attached unstretched. This completes the Y-tape application.

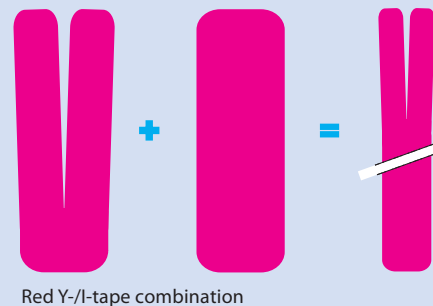
Part 2: The I-tape strips are measured from the lumbar spine and past the navel. Cut the end of the I-tape into Y-tape form, allowing the navel to remain free. The base is affixed over the first Y-tape strip (■ Fig. 3.3e). The muscle is pre-stretched and the base affixed with skin displacement. Apply the tape strip extending horizontally to just short of the navel, using 10% tape tension (■ Fig. 3.3f). Affix the lower tail of the Y-tape below the navel, and the upper tail above the navel (■ Fig. 3.3g).

The application is repeated on the opposite side of the trunk. ■ Fig. 3.3h illustrates the completed bilateral tonus-stimulating muscle application to the m. transversus abdominis.

Memo

Application: Muscle technique

Cutting technique: I-tape combined with a Y-tape



➤ **Muscle application overlaps the linea alba. The navel is left uncovered for reasons of hygiene.**



Fig. 3.4a–c Abdominal spiral. **a** Base is affixed to the navel at 7 o'clock, **b** using a fascial technique with 50% tape tension, the strip is affixed moving rhythmically in a spiral around the navel and the ends are attached unstretched, **c** completed abdominal spiral

3.1.3 Three-Month Colic

Three-month colic in infants is characterized by cramping stomach pain in the first few months of life.

■ Goal

A fascial application is affixed in spiral form around the navel, stimulating vagal tone.

■ Application

An I-tape is cut to a length of ten boxes, and divided lengthwise into four strips. Only one of the four strips is required for the application.

The base is affixed to the navel at 7 o'clock (■ Fig. 3.4a). Using a fascial technique, the tape strip is affixed with 50% tension, moving rhythmically in a spiral around the navel (■ Fig. 3.4b), and the tape ends attached unstretched. ■ Fig. 3.4c illustrates the completed abdominal spiral.

Memo

Application: Fascial technique

Cutting technique: I-tape, quartered



Red I-tape, quartered

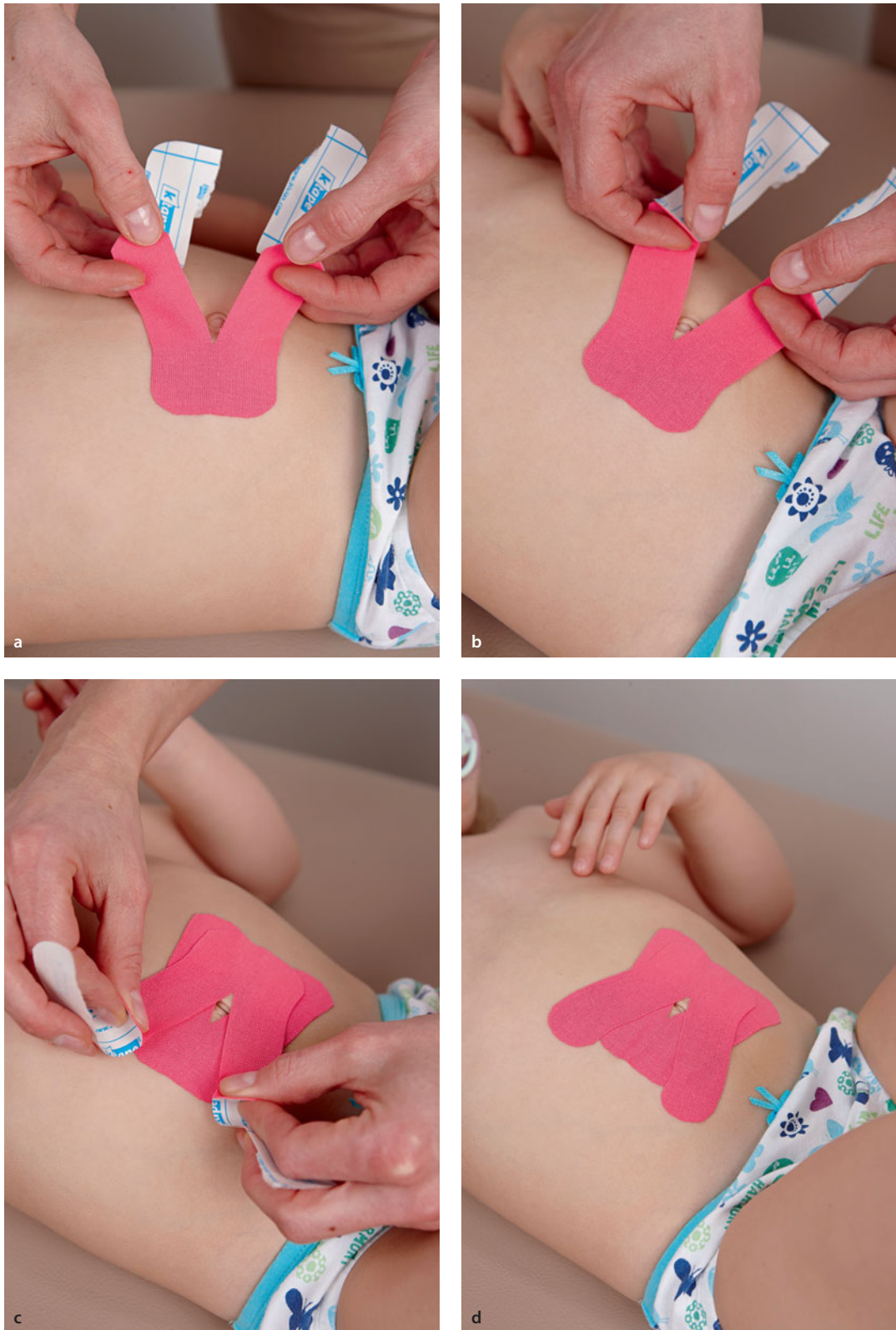


Fig. 3.5a–d Application for umbilical hernia. **a** The base is affixed one finger width to the side of the navel, **b** using a fascial technique with 50–75% tension, the tape is affixed rhythmically around the navel, **c** affix the second tape strip around the navel, using the same technique, **d** completed application

3.1.4 Umbilical Hernia

Most cases of umbilical hernia involve a gap in the opening for the umbilical cord. The cause is the incomplete development of the abdominal wall in the area around the navel.

■ Goal

Two fascial techniques are applied around the navel to decrease the size of the gap in the abdominal wall. The abdomen also benefits from increased ventral stability.

■ Application

The patient should be lying down, to relax the abdomen more effectively. Each of the tape strips should be 1.5 boxes in length. Both strips should be cut to form Y-tapes. Each base is affixed one finger width to the side of the navel (■ Fig. 3.5a). Before the fascial technique is applied, the navel should be reduced manually. The assistance of a second therapeutic hand can be helpful.

The first Y-tape tail is affixed rhythmically around the navel, using 50–75% tape tension (■ Fig. 3.5b). The tape ends are attached unstretched. Beginning from the opposite side of the trunk, the tails of the second Y-tape are also affixed rhythmically around the navel, with 50–75% tape tension, and the tape ends attached unstretched (■ Fig. 3.5c). The ends of the tape tails cross over each other at the linea alba. ■ Fig. 3.5d illustrates the completed application.

Memo

Application: Fascial technique

Cutting technique: Y-tape



Red Y-tape

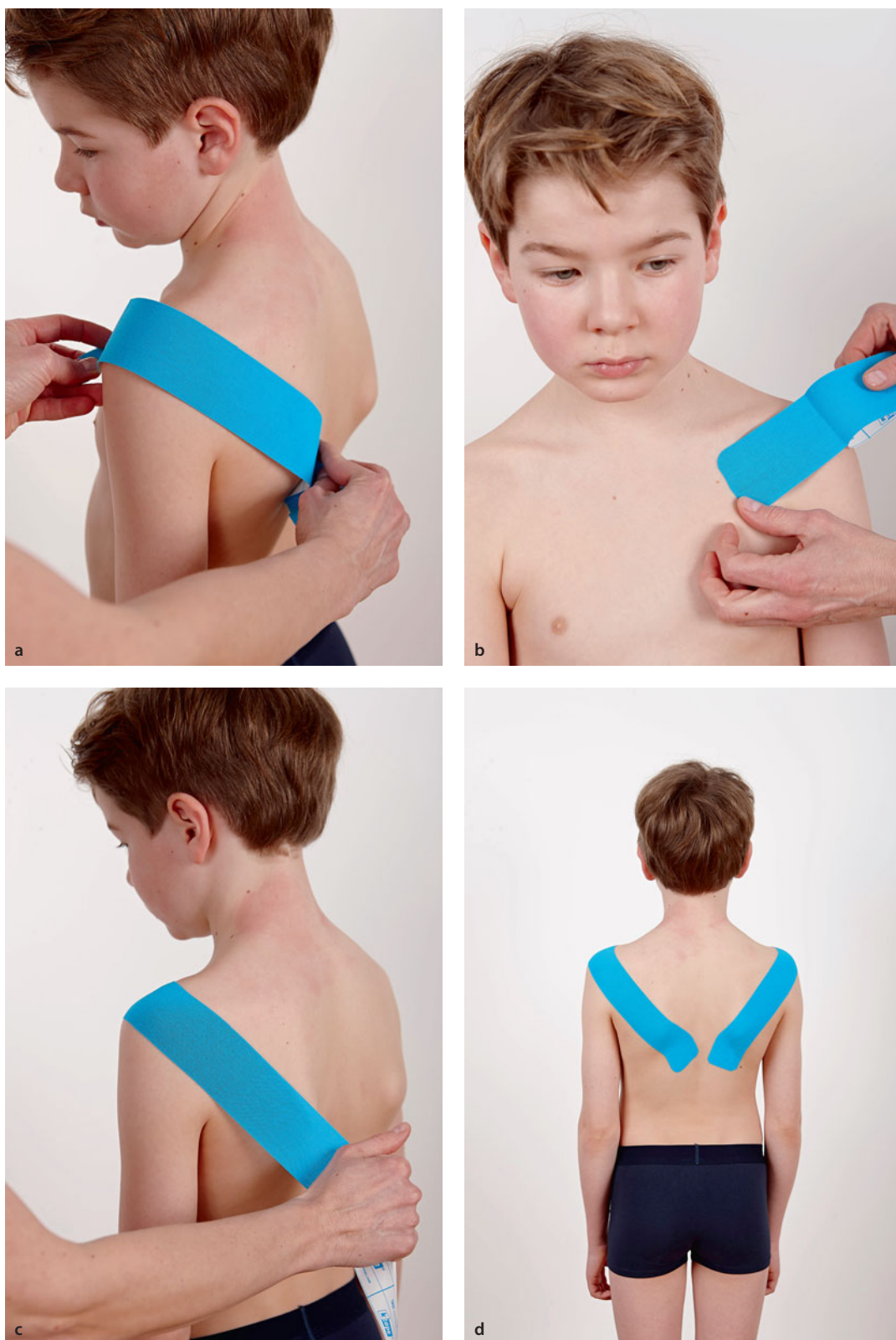


Fig. 3.6a–d Alignment of the trunk. **a** Measurement of the tape strip from the chest muscles across the acromion and scapula to T12, **b** the base is affixed over the chest muscles, **c** using a fascial technique, apply the tape rhythmically across the acromion and scapula to T12 with 50–75% tension, **d** completed bilateral application

3.1.5 Postural Disorders in Older Children

Weakness of the trunk muscles in older children may cause postural disorders and misalignment of the pelvis and the axis of the lower limbs.

Alignment of the Trunk

Weakness of the posterior muscles of the torso results in protraction of the trunk.

■ Goal

Upright alignment of the trunk with memory function.

■ Application

The tape length is measured from the chest muscles over the acromion and scapula, reaching T12 (■ Fig. 3.6a). A long, unstretched base is anchored over the chest muscles (■ Fig. 3.7b). The patient is optimally aligned in an upright posture. Using a fascial technique, the tape is affixed with rhythmic motion over the acromion and scapula in the direction of T12 with 50% tape tension (■ Fig. 3.6c). The tape ends are attached unstretched alongside the spine. The application is made bilaterally. ■ Fig. 3.6d illustrates the completed application.

Memo

Application: Fascial technique

Cutting technique: I-tape



Blue I-tape



Fig. 3.7a–e Leg axis correction. **a** Measurement of the tape strip in two spirals around the thigh, from the medial tibia head to the trochanter major, **b** the base is affixed medially below the popliteal crease, **c–d** tape affixed using a fascial technique, with 50% tension to the medial thigh and with 20% tension to the lateral thigh, **e** completed bilateral application

Leg Axis Correction

Weak trunk muscles in older children result in pelvic flexion and internal rotation gait.

■ Goal

Correction of the leg axis.

■ Application

The tape length is measured in two spirals around the thigh, from the medial tibia head to the trochanter major (■ Fig. 3.7a). In a resting position, the base is affixed below the medial popliteal crease (■ Fig. 3.7b). The leg is placed in lateral rotation. With varying tension, the tape is applied around the leg in spiral form: It is affixed with 50% tension to the medial thigh, and with 20% tension to the lateral thigh (■ Fig. 3.7c,d). The ends are affixed unstretched across the trochanter major. The application is made bilaterally. ■ Fig. 3.7e illustrates the completed application, shown in combination with the application for upright alignment of the trunk.

Memo

Application: Fascial technique

Cutting technique: I-tape



Blue I-tape



Fig. 3.8a–c Ligament application. **a** The tape is two to three boxes in length, **b** affix the tape en bloc with maximum tension, **c** completed ligament application

3.1.6 Hyperextension of the Knee (Genu Recurvatum)

Hyperextension of the knee may be caused by connective tissue laxity, compensation due to uneven deformities of the foot, or shortness of the contralateral extremity, for example, or result from posttraumatic or neurological damage.

■ Goal

- A ligament technique restricts hyperextension of the knee and increases dorsal stability.
- An additional tonus-stimulating muscle application to the popliteal muscle inhibits extension of the knee.
- The applications can be used separately or in combination, depending on the severity of the hyperextension.

Ligament Application

The tape strip measures two to three boxes in length (■ Fig. 3.8a), depending on the height of the child.

The patient's knee is slightly flexed. The tape is affixed en bloc with maximum tape tension (■ Fig. 3.8b). The tape should be rubbed thoroughly, and the tape ends attached unstretched. ■ Fig. 3.8c illustrates the completed application.

Memo

Application: Ligament technique

Cutting technique: I-tape



Red I-tape

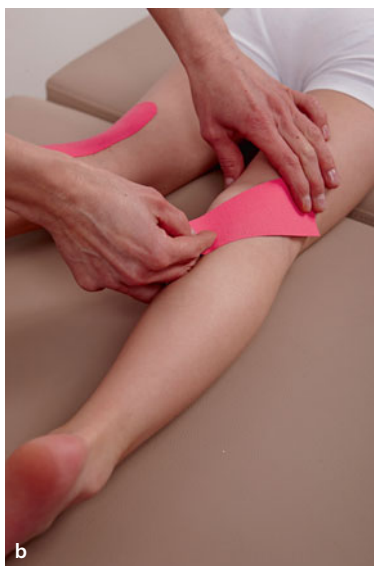
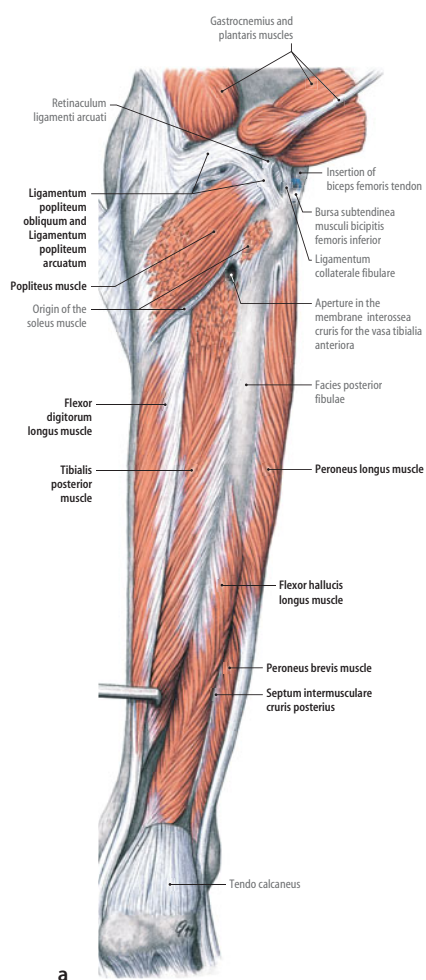


Fig. 3.9a–e Application to the popliteal muscle. **a** *M. popliteus*. (From Tillmann 2010). **b** Measure the tape strip from the epicondylus lateralis femoris to the posterior tibial fascia, **c** base affixed to the origin at the epicondylus lateralis femoris, **d** anchor the base with skin displacement and affix over the muscle belly to the insertion, using 10% tape tension, **e** completed tonus-stimulating muscle application to the right knee

Application to the Popliteal Muscle (■ Fig. 3.9a)

Origin

Epicondylus lateralis femoris

Insertion

Facies posterior tibiae

Function

Knee flexion and medial rotation of the tibia

Innervation

Tibial nerve (L4–S1)

■ Application

The tape is measured with the knee extended, from the epicondylus lateralis femoris to the posterior tibial fascia (■ Fig. 3.9b). The width of the tape may be reduced by one quarter or one half, depending on the size of the child.

With the patient in a resting position, the base is affixed to the origin at the epicondylus lateralis femoris (■ Fig. 3.9c). The muscle is pre-stretched and the base anchored with skin displacement. The tape is then affixed with 10% tension, over the muscle belly to the insertion (■ Fig. 3.9d). Rub the tape while pre-stretched. ■ Fig. 3.9e illustrates the completed tonus-stimulating muscle application to the popliteus of the right knee, in combination with the ligament application to the left knee.

Memo

Application: Muscle technique

Cutting technique: I-tape



Red I-tape

! Tip

When combining both taping techniques, it is useful to complete the muscle application prior to the ligament application.



Fig. 3.10a–d Ligament technique for the collateral ligaments. **a** Measure the tape length from insertion to insertion, **b** affix the first tape strip en bloc over the medial collateral ligament with maximum tape tension, **c** affix the second tape strip en bloc over the lateral collateral ligament with maximum tape tension, **d** completed bilateral application

3.1.7 Misalignment of the Knee Axis

Congenital misalignments of the knee axis may result from connective tissue weakness or misalignment of the feet.

■ Goal

A bilateral ligament application to the collateral ligaments is used to stabilize and guide movement of the knee joint.

■ Application

The tape length is measured from insertion to insertion of the ligamentum collaterale tibiale and the ligamentum collaterale fibulare (■ Fig. 3.10a). The width of the tape may be reduced by one quarter or one half, depending on the size of the child. The knee is in the anatomical zero-degree position. Stretch the tape maximally and affix the stretched area en bloc, rubbing the tape thoroughly (■ Fig. 3.10b). Place the knee in full flexion and attach the tape ends unstretched.

The same technique is used for the application to the collateral ligament (■ Fig. 3.10c).

■ Fig. 3.10d illustrates the completed bilateral application to the collateral ligaments.

Memo

Application: Ligament technique

Cutting technique: I-tape



Red I-tape

! Tip

If the axial misalignment is extreme, a corrective application may be affixed to only one of the collateral ligaments. In case of genu valgum, for example, a unilateral application to the ligamentum collaterale tibiale is recommended. If a misalignment of the foot axis is also present, this should be corrected.

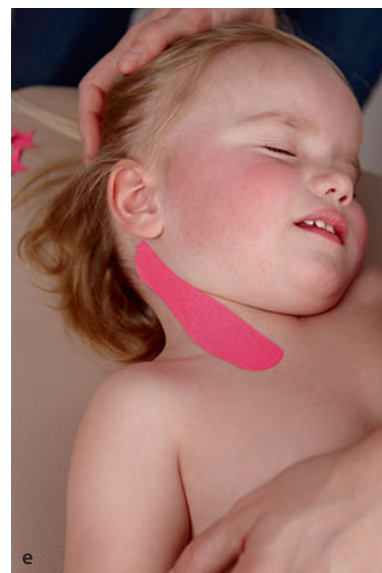
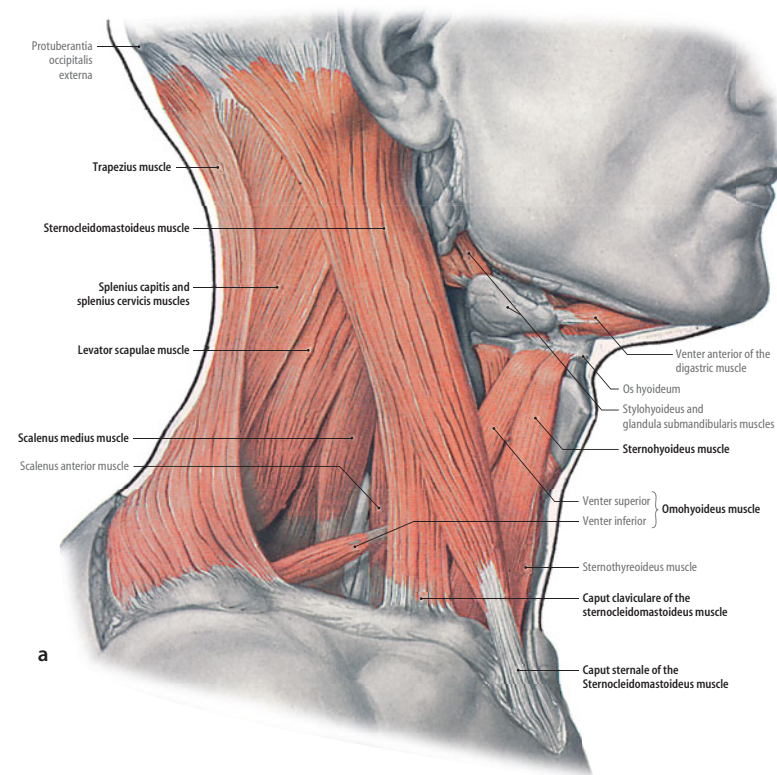


Fig. 3.11a–e Application to the sternocleidomastoid muscle. **a** M. sternocleidomastoideus. (From Tillmann 2010). **b** Measure the tape strip from the processus mastoideus to the sternum, **c** anchor the base to the origin at the sternoclavicular joint, **d** affix the tape strip over the muscle belly to the insertion on the processus mastoideus using 10% tape tension, **e** completed muscle application

3.1.8 Asymmetry of the Cervical Spine

Congenital muscular torticollis (torticollis muscularis) typically presents with connective tissue changes such as shortening of the sternocleidomastoid muscle. The causes remain unclear, but may include intrauterine malposition or birth trauma. The muscular asymmetry frequently occurs in combination with other congenital abnormalities such as club foot (talipes) and hip dysplasia.

➤ **It is important to eliminate alternative causes of cervical misalignment, such as osseous malformation.**

■ Goal

Mobility of the cervical spine is improved using a tonus-stimulating muscle application to the sternocleidomastoid muscle on the lengthened side of the neck and a Crosstape application to the shortened side or the hematoma in the sternocleidomastoid muscle.

Tonus-Stimulating Application to the Sternocleidomastoid Muscle (▣ Fig. 3.2a) on the »Lengthened Side«

Origin

Medial head at the sternum and lateral head at the clavicle

Insertion

Processus mastoideus and linea nuchae superior

Function

- ▬ Unilateral contraction: rotation to the contralateral side and lateral flexion to the ipsilateral side
- ▬ Bilateral contraction: cervical flexion and extension of the head

Innervation

Accessory nerve and fibers of the cervical plexus at C1–C2

■ Application

The muscle is pre-stretched in lateral flexion to the affected side and rotation to the same side, and the tape length measured from the processus mastoideus to the sternum (▣ Fig. 3.11b). The tape can be halved depending on the size of the neck. A second therapist is usually required for the application, to immobilize the head.

In the optimal resting position, the base is affixed to the origin at the sternoclavicular joint (▣ Fig. 3.11c). The muscle is pre-stretched as much as possible. Anchor the base with skin displacement, then affix the tape with 10% tension over the muscle belly to the processus mastoideus (▣ Fig. 3.11d). Rub the tape while pre-stretched. ▣ Fig. 3.11e illustrates the completed tonus-stimulating muscle application to the sternocleidomastoid muscle.

Memo

Application: Muscle technique

Cutting technique: I-tape



Red I-tape



Fig. 3.12a,b Crosstape application. **a** Completed Crosstape application to the scalene muscles, **b** completed bilateral combined application using muscle technique and Crosstape

Crosstape Application to the »Short Side«

Laterally flex away from the shortened side and rotate the child's head in the direction of the affected side as much as possible to pre-stretch, then affix the Crosstape to the sternocleidomastoid muscle, the scalene muscles, or the hematoma (■ Fig. 3.12a).

■ Fig. 3.12b illustrates the completed muscle application to the sternocleidomastoid muscle and the Crosstape application to the scalene muscles.

Memo

Application: Crosstape

Cutting technique: Crosstape



Red I-tape

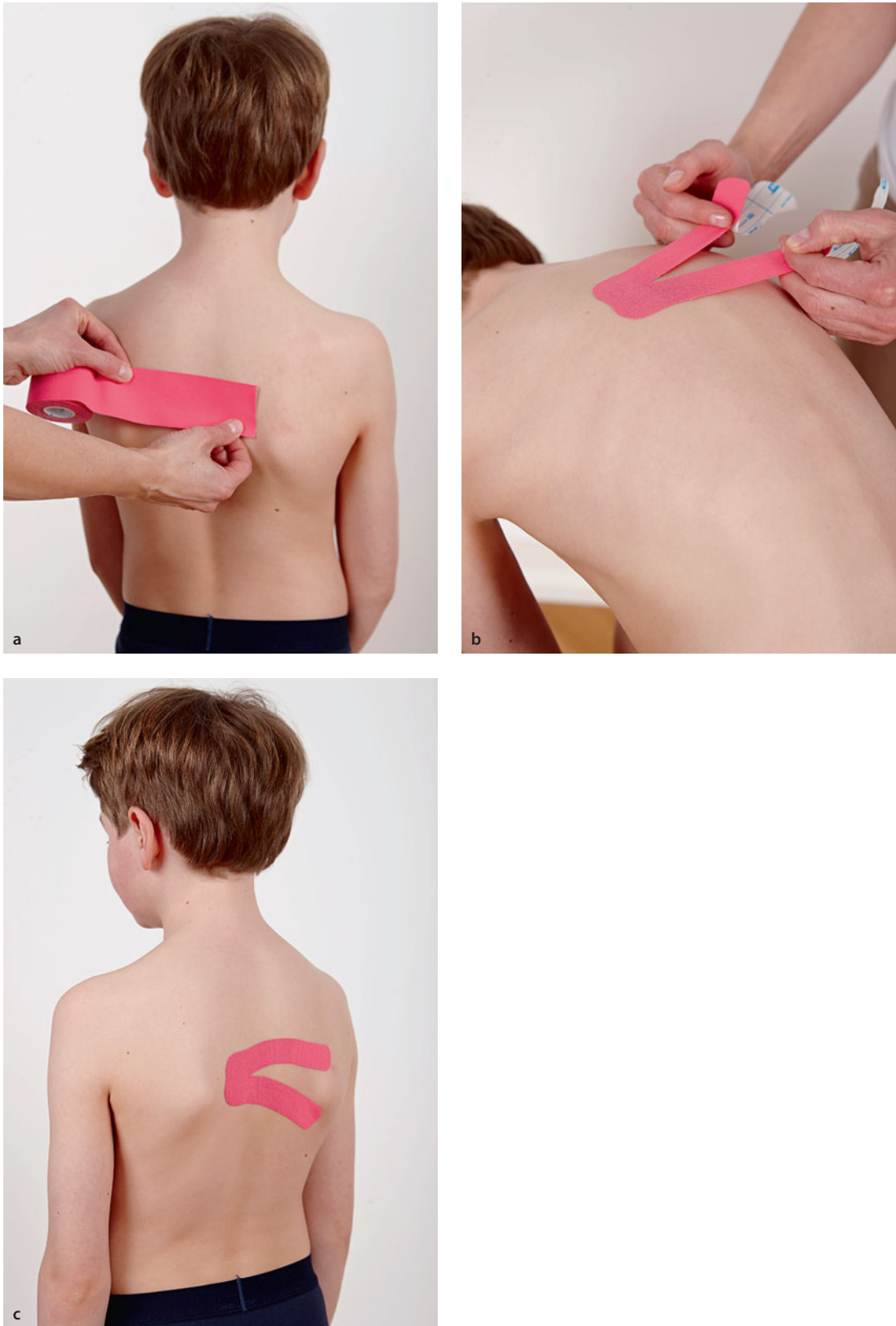


Fig. 3.13a–c Thoracic fascial application. **a** The tape is approximately three boxes long, **b** the base is affixed paravertebrally at the apex, the tape is attached across the spine using 75% tension and pulsing motion, **c** completed fascial technique

3.1.9 Scoliosis

In 90% of cases, the causes of scoliosis are unknown (idiopathic scoliosis). However, it is classified according to age of onset as follows:

- Infantile idiopathic scoliosis (IIS): onset prior to 3 years of age
- Juvenile idiopathic scoliosis (JIS): onset between 4 and 10 years of age
- Idiopathic adolescent scoliosis (AIS): onset after 11 years of age

In the remaining 10% of cases, the causes of scoliosis are known, e.g., spinal deformities or neural or muscular disorders. Such cases are referred to as secondary or symptomatic scoliosis.

■ Goal

Muscle applications and fascial corrective techniques are used to improve muscle imbalances and spinal curvature.

Thoracic Fascial Application

The thoracic spine is convex to the left in the example given.

The tape strip is three boxes in length (■ Fig. 3.13a). The tape is cut into Y-tape form.

The base is affixed paravertebrally at the apex, on the left side of the trunk with the trunk slightly flexed. The trunk is subsequently placed in full flexion, and the tape tails affixed to the skin crossing the spine with 75% tension and rhythmic motion (■ Fig. 3.13b). The tape ends are attached unstretched. ■ Fig. 3.13c illustrates the completed fascia-correcting application to the thoracic spine.

Memo

Application: Fascial technique

Cutting technique: Y-tape



Red Y-tape



Fig. 3.14a–f Lumbar muscle application. **a** Autochthonous back musculature. (From Tillmann 2010). **b** Affix the base of the tonus-reducing application to the sacrum, **c** anchor the base with skin displacement and affix the tape over the musculature using 10% tape tension, **d** affix the base of the tonus-stimulating tape strips paravertebrally at the level of T12, **e** anchor the base with skin displacement and affix the tape over the musculature using 10% tape tension, **f** completed bilateral muscle application

Lumbar Muscle Application to the Autochthonous Musculature (■ Fig. 3.14a)

Origin/Insertion

- Lateral tract (superficial):
Extends from pelvis to skull, long muscles, subdivided into intertransversal and spinotransversal muscle groups
- Medial tract (deep):
Straight system: interspinal and intertransversal
Diagonal system: transversospinal

Function

Extension of the trunk

Innervation

Rami dorsales of the spinal nerves

■ Application

In this example, the lumbar spine is convex to the right. A tonus-reducing application is affixed to the lumbar region on the left side of the trunk, and a tonus-stimulating muscle application on the right.

Both tape lengths are measured from the sacrum to T12, with the trunk in maximum flexion.

With the trunk in slight flexion, the base of the **tonus-reducing application** is affixed to the sacrum (■ Fig. 3.14b). The muscle is maximally pre-stretched, the base anchored with skin displacement. The tape is then affixed paravertebrally to the level of T12, using 10% tape tension (■ Fig. 3.14c). Rub the tape while in the pre-stretched position.

The base of the **tonus-stimulating application** to the right side is also affixed with the trunk in slight flexion, paravertebrally at the level of T12 (■ Fig. 3.14d). The muscle is pre-stretched maximally and the base anchored with skin displacement. The tape is then affixed paravertebrally as far as the sacrum, using 10% tape tension (■ Fig. 3.14e). Rub the tape while in the pre-stretched position.

■ Fig. 3.14f illustrates the completed lumbar muscle application, combined with the thoracic fascial application.

Memo

Application: Muscle technique

Cutting technique: I-tape



Blue I-tape

! Tip

A combination of muscle technique and fascial technique is possible in both the lumbar and thoracic regions.

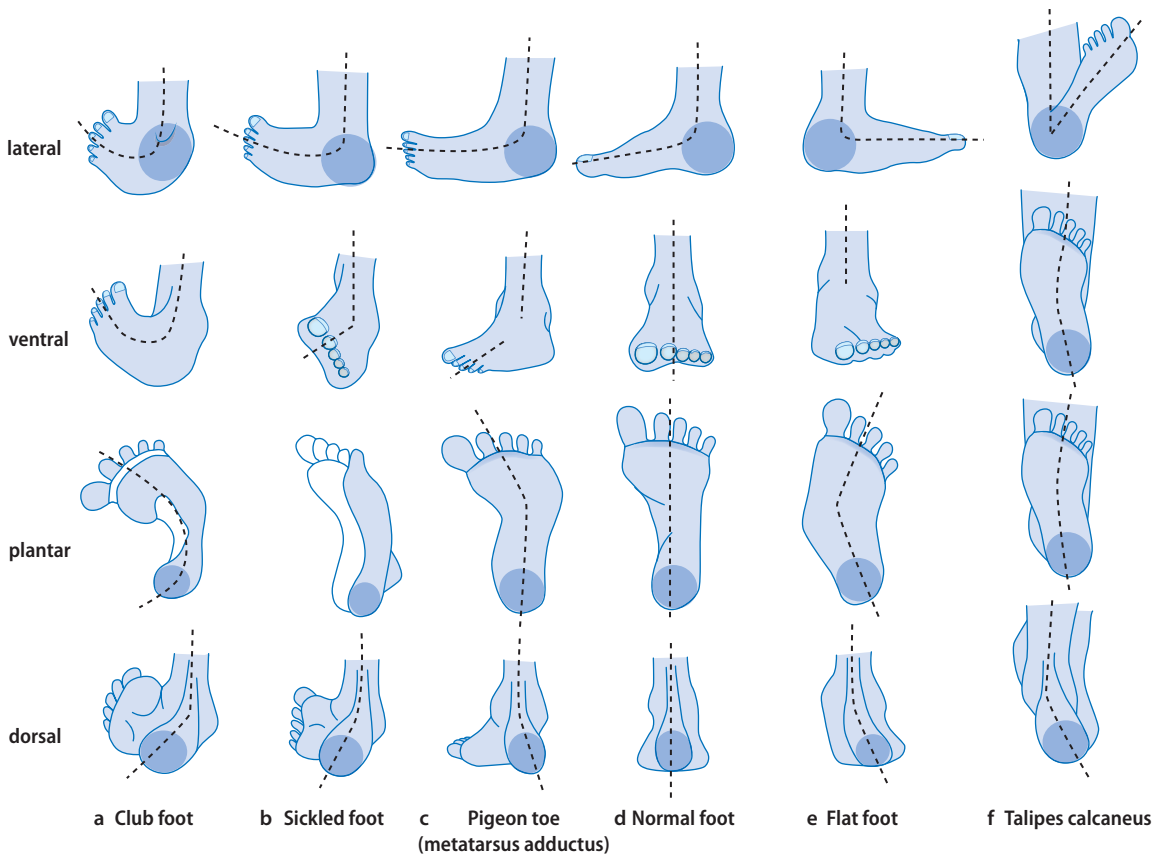


Fig. 3.15a–f Foot deformities in detail. **a** Club foot; dorsal: supination of the calcaneus, plantar: sickled forefoot, hollow foot, ventral: greater supination of the rearfoot in relation to the forefoot, lateral: adducted forefoot, **b** sickled foot (talipes supinatus); dorsal: supination of the calcaneus, plantar/ventral/lateral: supination of both rearfoot and midfoot, **c** pigeon toe (metatarsus adductus); dorsal: calcaneus pronated, plantar/ventral/lateral: adduction of the midfoot and toes, **d** normal foot for comparison, **e** flat foot; dorsal: pronation of the calcaneus, plantar: dropped medial margin of the foot, ventral: forefoot in abduction, lateral: dropped medial margin of the foot, **f** talipes calcaneus; dorsal: pronation of the calcaneus, plantar/ventral: base of the foot pronated, lateral: dorsal extension of the foot

3.2 Deformities of the Foot

The following foot deformities can be distinguished from each other in terms of their appearance:

- Pigeon toes (metatarsus adductus)
- Flat foot (talipes valgus)
- Spastic sickled foot
- Club foot (talipes equinovarus, excavatus et adductus)
- Club foot (talipes calcaneus)
- Club foot (talipes equinus)
- Sickled foot (talipes supinatus)

These deformities may occur individually or in combination. They are often linked to other conditions, such as hammer or claw toes and hallux valgus.

A proportion of these deformities are present at birth, others manifest later in life. ■ Fig. 3.15 illustrates the different deformities of the foot in detail.

3.2.1 Metatarsus Adductus

The term *metatarsus adductus* (*pigeon toes*) is used to describe an excessive adduction of the midfoot and toes. The rearfoot is in a valgus position and usually mobile.

■ Goal

A variety of application techniques are used to elongate the medial margin and correct inversion of the foot.

The foot can be corrected using the following three techniques:

1. Combined tonus-reducing muscle application to the abductor hallucis and a fascial correction around the foot
2. Combined functional and fascial correction
3. Fascial correction

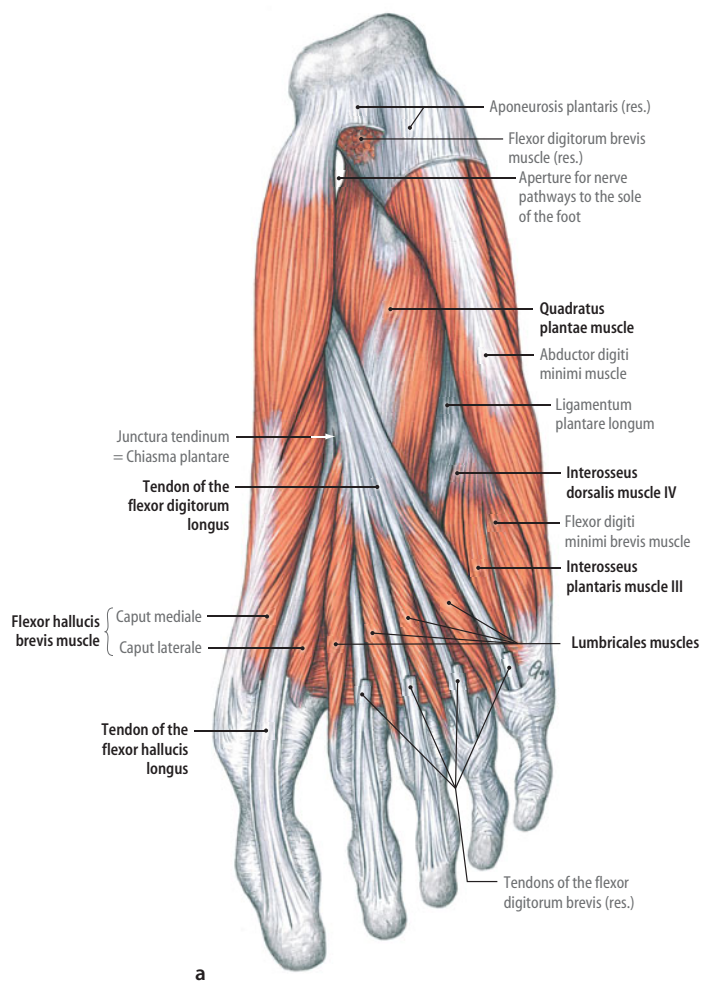


Fig. 3.16a–e Tonus-reducing application to the m. abductor hallucis. **a** M. abductor hallucis. (From Tillmann 2010). **b** Measure the tape length from the MTP joint of the big toe to the tuber calcanei, **c** affix the base at the MTP joint of the big toe, **d** anchor the base with skin displacement and affix the tape over the muscle belly to the tuber calcanei with 10% tape tension, **e** completed muscle application

Combined Tonus-Reducing Muscle Application to the Abductor Hallucis and Fascial Correction Around the Foot

Tonus-Reducing Muscle Application to the M. Abductor Hallucis (■ Fig. 3.16a)

Origin

Processus medialis of the tuber calcanei, the retinaculum of the flexor muscle and the plantar aponeurosis

Insertion

At the medial sesamoid bone and the base of the proximal phalanx

Function

Abduction and slight flexion of the big toe, supports the medial arch of the foot

Innervation

N. plantaris medialis (L5–S1)

■ Application

The tape length is measured from the metatarsophalangeal (MTP) joint of the big toe to the tuber calcanei (■ Fig. 3.16b), and the tape is halved lengthwise. The base is affixed at the origin of the MTP joint of the big toe (■ Fig. 3.16c). The medial margin of the foot is elongated manually in order to stretch the muscle, for which the assistance of a second therapist may be helpful. The base is anchored with skin displacement, and the tape affixed over the muscle belly to the tuber calcanei, with 10% tape tension (■ Fig. 3.16d). Rub the tape while in the pre-stretched position. ■ Fig. 3.16e illustrates the completed muscle application to the abductor hallucis.

Memo

Application: Muscle technique

Cutting technique: I-tape



Blue I-tape

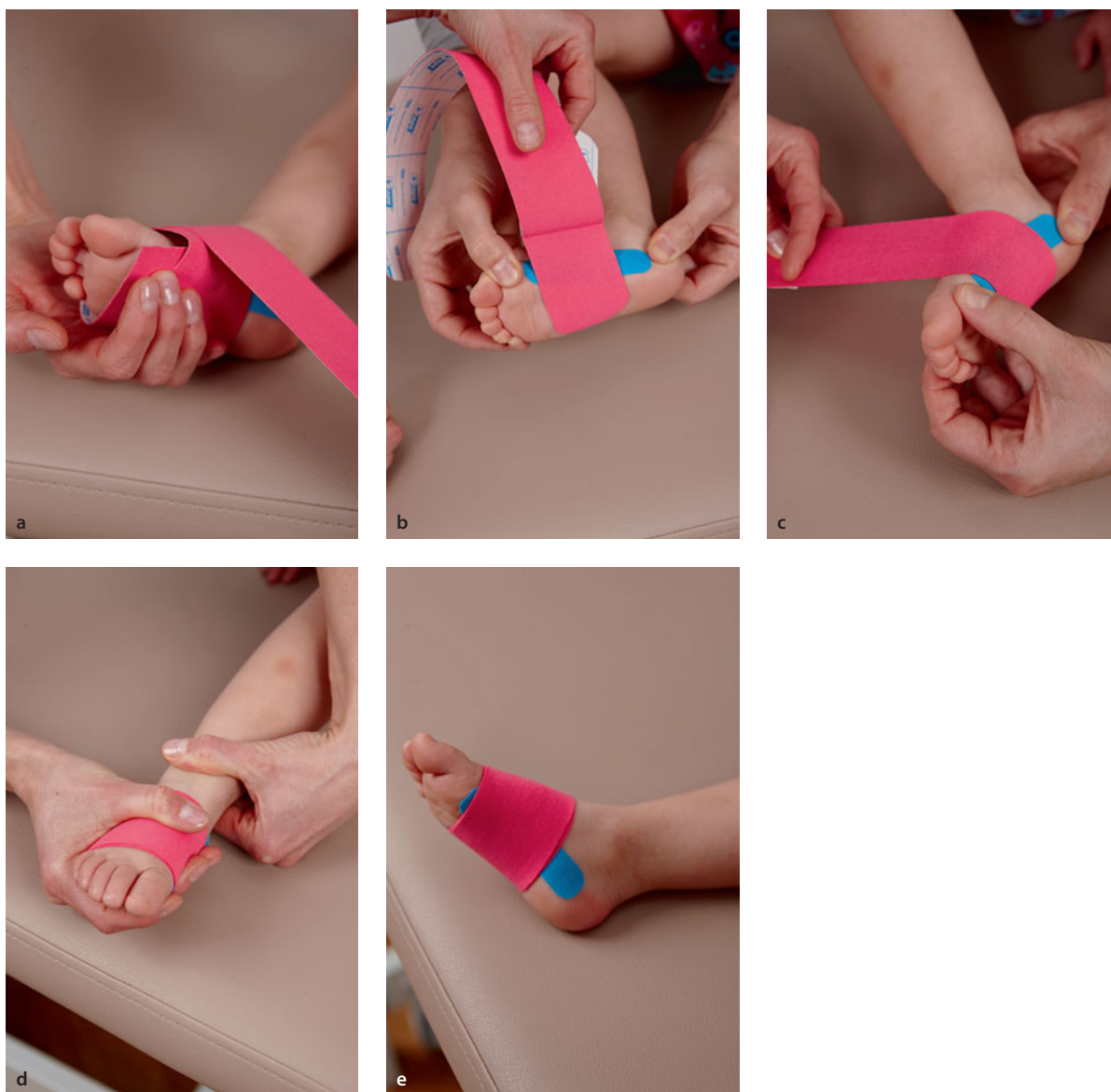


Fig. 3.17a–e Fascia-correcting application around the foot. **a** Measurement of the tape length twice around the foot, from the lateral margin to the instep, **b** affix the base to the sole at the lateral margin of the foot, **c** affix the tape with 10% tension across the sole of the foot, 50% tension across the instep, **d** release any wrinkles in the taped skin around the ankle by plantar flexing the foot and smoothing the skin upward with the hand, **e** completed application combining muscle technique and fascial correction

Fascia-Correcting Application Around the Foot

The tape length is measured twice around the foot, from the lateral margin to the instep (■ Fig. 3.17a).

! Tip

Measure the width of the foot using your fingers, then wind the tape around the fingers to determine the required length of tape.

The base is affixed at the lateral margin of the foot (■ Fig. 3.17b). The foot is then manually corrected in inversion by means of the calcaneus and sesamoid bones, and preferably stabilized in this position by a second person. Affix the tape with 10% tension across the sole of the foot, 50% tension from the medial margin of the foot across the instep (■ Fig. 3.17c), and once more around the foot using the same tension. Finally, attach the tape halfway around the foot to the instep without tension. Rub the tape thoroughly.

➤ **Release any wrinkles in the taped skin around the ankle joint, by extending the foot into plantar flexion and smoothing the skin upward manually (■ Fig. 3.17d).**

■ Fig. 3.17e illustrates the completed combined muscle- and fascia-correcting applications.

Memo

Application: Fascial technique

Cutting technique: I-tape



Red I-tape



Fig. 3.18a–f Combined functional and fascial correction. **a** Measurement of the tape strip from the tuber calcanei, laterally across the MTP joints to the MTP joint of the big toe, **b** tear the backing paper in the middle, affix the base laterally at the MTP joint of the 5th toe, **c** affix the Y-tape end to provide functional correction, anchor the base with skin displacement, correct the foot manually; affix lower tape tail across the sole of the 5th toe MTP joint to the big toe MTP joint using 75% tape tension, **d** affix the upper tape tail to the instep of the foot across the MTP joints, to the joint of the big toe, attach both ends unstretched, **e** affix the I-tape using a fascial technique; correct the foot and apply the tape to the lateral margin of the foot using 75% tension, **f** completed combined application for functional and fascial correction

Combined Functional and Fascia-Correcting Application

The tape is measured from the tuber calcanei laterally across the MTP joints to the MTP joint of the big toe (■ Fig. 3.18a). Half of the tape is cut into Y-tape form.

The backing paper is torn in the middle, the base affixed laterally to the MTP joint of the 5th toe (■ Fig. 3.18b). The purpose of the **Y-tape end** is **functional correction**. The base is therefore anchored with skin displacement and the foot manually corrected. The lower tape tail is affixed across the sole of the 5th toe MTP joint to the big toe MTP joint, with 75% tape tension (■ Fig. 3.18c). The upper tape tail is affixed over the instep of the foot across the MTP joints, to the MTP joint of the big toe (■ Fig. 3.18d). Both ends are attached unstretched.

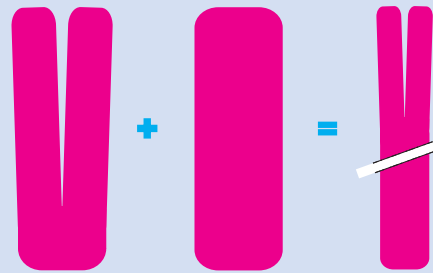
The **I-tape end** is now affixed using a **fascial technique**. Correct the foot and apply the tape to the lateral margin of the foot using 75% tension (■ Fig. 3.18e).

■ Fig. 3.9f illustrates the completed combined application for functional and fascial correction.

Memo

Application: Fascial technique, corrective technique

Cutting technique: I-tape with transition into Y-tape



Red combined Y-/I-tape

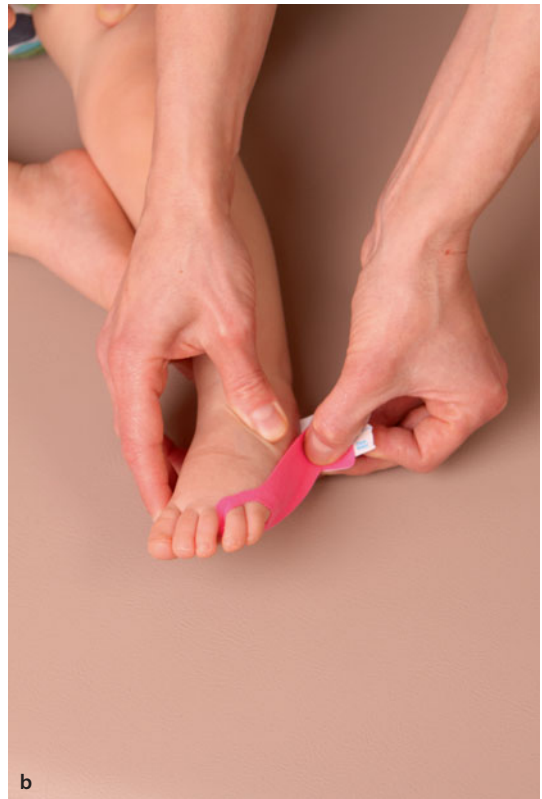


Fig. 3.19a–c Fascial technique. **a** Place the cut-out hole over the 4th and 5th toes, **b** place foot in the corrected position and apply tape using a fascial technique to the lateral margin of the foot, using 75% tape tension, **c** completed fascial technique

Fascial Correction

The tape length is measured from the lateral tuber calcanei along the lateral margin of the foot to the 4th toe.

The tape is folded at one end, and a triangle cut out of the closed end (► Sect. 3.1.1). The hole created is then placed over the 4th and 5th toes (■ Fig. 3.19a) and the tape affixed to the lateral margin of the foot with 75% tape tension (■ Fig. 3.19b).

The tape ends are attached unstretched. ■ Fig. 3.19c illustrates the completed fascial technique.

Memo

Application: Fascial technique

Cutting technique: I-tape with hole at one end



Red I-tape with hole at one end

! Tip

Holes are frequently made too large, as the tape is subsequently stretched. Therefore keep the hole small initially, and enlarge later if necessary.



Fig. 3.20a–f Fascial correction to the foot. **a** The tape strip is measured twice around the foot, from the lateral malleolus to medial malleolus, **b** affix the base at the lateral malleolus, **c** affix the tape with 50% tension across the sole and medial margin of the foot and with 10% tension over the instep, **d** increase effectiveness by affixing tape with 75% tension from the medial margin of the foot to the medial malleolus, **e** release any skin wrinkles beneath the tape by plantar flexing the foot and stroking the skin upward, **f** completed corrective application

3.2.2 Flat Foot (Talipes Valgus)

Flat foot is a static deformity. The talus is misaligned medially and inferiorly, the calcaneus is in a pronated position.

■ Goal

The foot is lifted medially using fascial correction.

■ Application

The length of the tape is measured twice around the foot, from the lateral malleolus to the medial malleolus (■ Fig. 3.20a).

The base is affixed at the lateral malleolus (■ Fig. 3.20b). The foot is supinated and plantar flexed, to correct the position of the talus, then manually corrected in inversion by means of the calcaneus and sesamoid bone. It is preferable for a second person to stabilize the foot. Affix the tape with 50% tension across the sole and medial margin of the foot, and with 10% tension over the instep (■ Fig. 3.20c); wrap the tape around the foot a second time using the same tape tension. Finally, to increase the corrective effect, affix the tape using 75% tension from the sole over the medial margin of the foot to the medial malleolus (■ Fig. 3.20d). Attach the tape ends unstretched.

➤ **Release any wrinkles in the taped skin around the ankle joint by extending the foot into plantar flexion and smoothing the skin upward manually (■ Fig. 3.11 e).**

■ Fig. 3.20f illustrates the completed corrective application.

Memo

Application: Fascial technique

Cutting technique: I-tape



Red I-tape



Fig. 3.21a–d 1. Corrective tension around the foot. **a** The base lies on the instep, at the lateral margin of the foot, **b** pull the tape further across the instep to the sole of the foot using 50% tension, **c** affix the tape obliquely from the lateral margin of the foot, across the ankle to the lower leg with 80% tape tension, **d** completed application

3.2.3 Spastic Sickled Foot

In cases of spastic sickled foot, increased adduction of the forefoot is caused by imbalances in the foot musculature.

■ Goal

A fascial correction and a ligament technique are used in combination, to correct inversion and elongate the medial margin of the foot.

Fascial Technique (1. Corrective Tension)

From the lateral margin of the foot, the tape length is measured over the instep and around the sole of the foot to the ankle.

The base of the tape lies on the instep, at the lateral margin of the foot (■ Fig. 3.21a). Using 50% tension, pull the tape across the rest of the instep and around the sole of the foot (■ Fig. 3.21b). Then use 80% tension to affix the tape obliquely, from the lateral margin over the ankle joint to the lower leg (■ Fig. 3.21c). Attach the remaining tape unstretched. ■ Fig. 3.21d illustrates the completed application.

Memo

Application: Fascial technique

Cutting technique: I-tape



Red I-tape



Fig. 3.22a–e 2. Corrective tension around the foot. **a** Measure the tape from the lateral malleolus under the sole of the foot to the center of the ankle, **b** affix the base centrally to the sole of the foot, **c** affix the lateral tape tail with 75% tension, from the lateral margin to the ankle joint, **d** affix the medial tape tail with 50% tension, from the medial margin to the ankle joint, **e** completed combined application

Ligament Technique (2. Corrective Tension)

The tape length is measured from the lateral malleolus across the sole of the foot to the middle of the ankle joint (■ Fig. 3.22a). To create the base, cut through the backing paper in the center and affix the middle of the tape to the sole of the foot midway (■ Fig. 3.22b). Manually correct the supination of the foot and stabilize in the zero position. The lateral tape tail is affixed over the lateral margin of the foot to the middle of the ankle, with 75% tension (■ Fig. 3.22c). Attach the tape end unstretched. Affix the medial tape tail over the medial margin of the foot to the middle of the ankle with 50% tension (■ Fig. 3.22d). Attach the tape ends unstretched. ■ Fig. 3.22e illustrates the completed tape combination.

Memo

Application: Ligament technique

Cutting technique: I-tape



Red I-tape

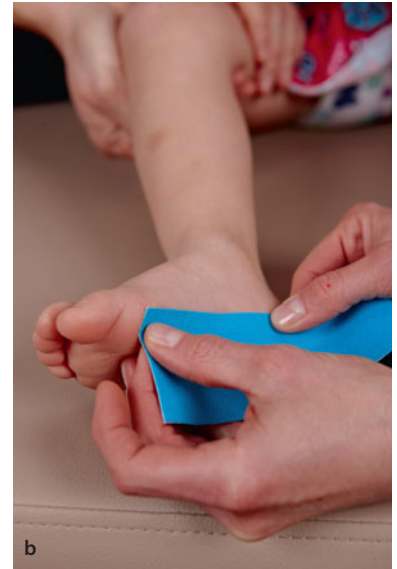
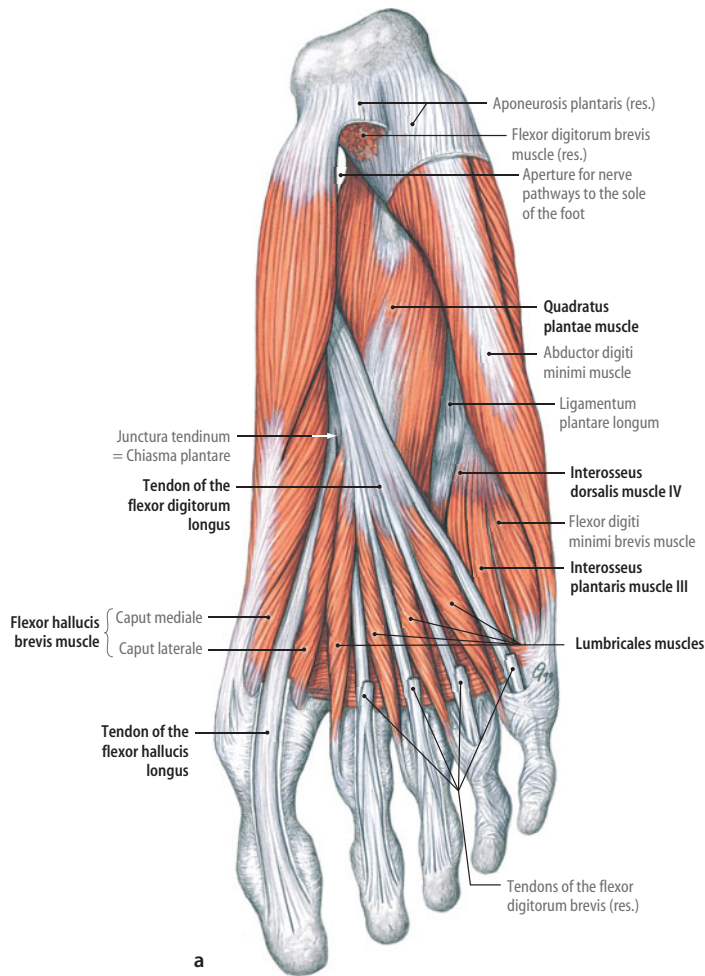


Fig. 3.23a–e Tonus-reducing muscle application to the m. abductor hallucis. **a** M. abductor hallucis. (From Tillmann 2010). **b** Measure the tape length from MTP joint of the big toe to the tuber calcanei, **c** affix the base to the big toe at the MTP joint, **d** anchor the base with skin displacement and affix the tape with 10% tension over the muscle belly to the tuber calcanei, **e** completed muscle application

3.2.4 Club Foot

The term *club foot* refers to a variety of deformities. It is possible to differentiate between congenital and acquired (neuromuscular) club foot.

Congenital club foot is the most common form and the term covers several defects:

- Rearfoot supination (varus deformity)
- Plantar declination (talipes equinus)
- Sickled foot (talipes supinatus)
- Hollow foot (talipes excavatus)

Shortening of the Achilles tendon usually occurs in conjunction with the deformity.

■ Goal

A muscle application and a corrective application are combined to elongate the medial margin of the foot and correct the os cuboideum medially.

Tonus-Reducing Muscle Application to the M. Abductor Hallucis (■ Fig. 3.23a)

Origin

Processus medialis of the tuber calcanei, from the flexor retinaculum and the plantar aponeurosis

Insertion

The medial sesamoid bone and the base of the proximal phalanx

Function

Abduction and slight flexion of the big toe, supports the medial arch of the foot

Innervation

N. plantaris medialis (L5–S1)

■ Application

The tape length is measured from the metatarsophalangeal (MTP) joint of the big toe to the tuber calcanei (■ Fig. 3.23b), and the tape halved lengthways. The base is affixed at the MTP joint of the big toe (■ Fig. 3.23c). The medial margin of the foot is stretched manually in order to stretch the muscle, for which the assistance of a second therapist may be helpful. The base is anchored with skin displacement, and the tape affixed over the muscle belly to the tuber calcanei, using 10% tape tension (■ Fig. 3.23d). Rub the tape while in the pre-stretched position. (■ Fig. 3.23e illustrates the completed muscle application to the abductor hallucis.

Memo

Application: Muscle technique

Cutting technique: I-tape



Blue I-tape



Fig. 3.24a–f Fascia-correcting application around the foot. **a** Measurement of the tape length twice around the foot, from the lateral margin to the instep, **b** affix the base to the sole at the lateral margin of the foot, **c** affix the tape with 10% tension across the sole of the foot, 50% tension across the instep, **d** second time around the foot with the same tension, 10% across the sole of the foot, 50% across the instep, **e** release any wrinkles in the taped skin around the ankle by plantar flexing the foot and smoothing the skin upward with the hand, **f** completed application combining muscle technique and fascial correction

Fascia-Correcting Application Around the Foot

■ Application

The tape length is measured twice around the foot, from the lateral margin to the instep (■ Fig. 3.24a).

! Tip

Measure the width of the foot using your fingers, then wind the tape around the fingers to determine the required length of tape.

The base is affixed at the lateral margin of the foot at the sole (■ Fig. 3.24b). The foot is then manually corrected in inversion by means of the calcaneus and sesamoid bones, and preferably stabilized in this position by a second person. Affix the tape with 10% tension across the sole of the foot, 50% tension from the medial margin of the foot to the instep (■ Fig. 3.24c). Once more around the foot with the same tape tension; 10% tension on the sole of the foot and 50% on the instep (■ Fig. 3.24d). Finally, attach the tape halfway around the foot to the instep with no tension.

Rub the tape thoroughly.

- **Release any wrinkles in the taped skin around the ankle joint, by extending the foot into plantar flexion and smoothing the skin upward manually (■ Fig. 3.24e).**

■ Fig. 3.24f illustrates the completed combined muscle application and fascial correction.

Memo

Application: Fascial technique

Cutting technique:



Red I-tape



Fig. 3.25a–d Fascial correction for talipes calcaneus. **a** Base lies on the sole at the lateral margin of the foot, **b** affix the tape with 10% tension over the sole and 50% tension from the medial margin of the foot across the instep, **c** release any wrinkles in the skin at the ankle by plantar flexing the foot and smoothing the skin upward manually, **d** completed corrective application

3.2.5 Talipes Calcaneus

Talipes calcaneus is a relatively common deformity in newborns. The ankle joint is in excessive dorsiflexion and plantar flexion is limited. The sole of the foot is pronated. The cause is generally weakness or lack of development of the calf muscles.

■ Goal

A fascial technique is used to correct the foot in supination and plantar flexion.

■ Application

The same application is used as for club foot; however, the taping is more proximal to the ankle joint.

The tape length is measured twice around the foot, from the lateral margin to the instep.

! Tip

Measure the width of the foot using your fingers, then wind the tape around the fingers to determine the required length of tape.

The base lies at the lateral margin of the sole of the foot (■ Fig. 3.25a). The foot is then manually corrected into plantar flexion with additional inversion, by means of the calcaneus and sesamoid bones. It is preferable to have a second person stabilize the correction. The tape is then affixed with 10% tension over the sole and 50% tension from the medial margin of the foot across the instep (■ Fig. 3.25b). Affix the tape a second time around the foot with the tape tension used previously. Finally, attach the tape halfway around the foot to the instep with no tension.

➤ **Release any wrinkles in the taped skin around the ankle joint, by extending the foot into plantar flexion and smoothing the skin upward manually (■ Fig. 3.25c).**

■ Fig. 3.25d illustrates the completed corrective application.

Memo

Application: Fascial technique

Cutting technique: I-tape



Red I-tape

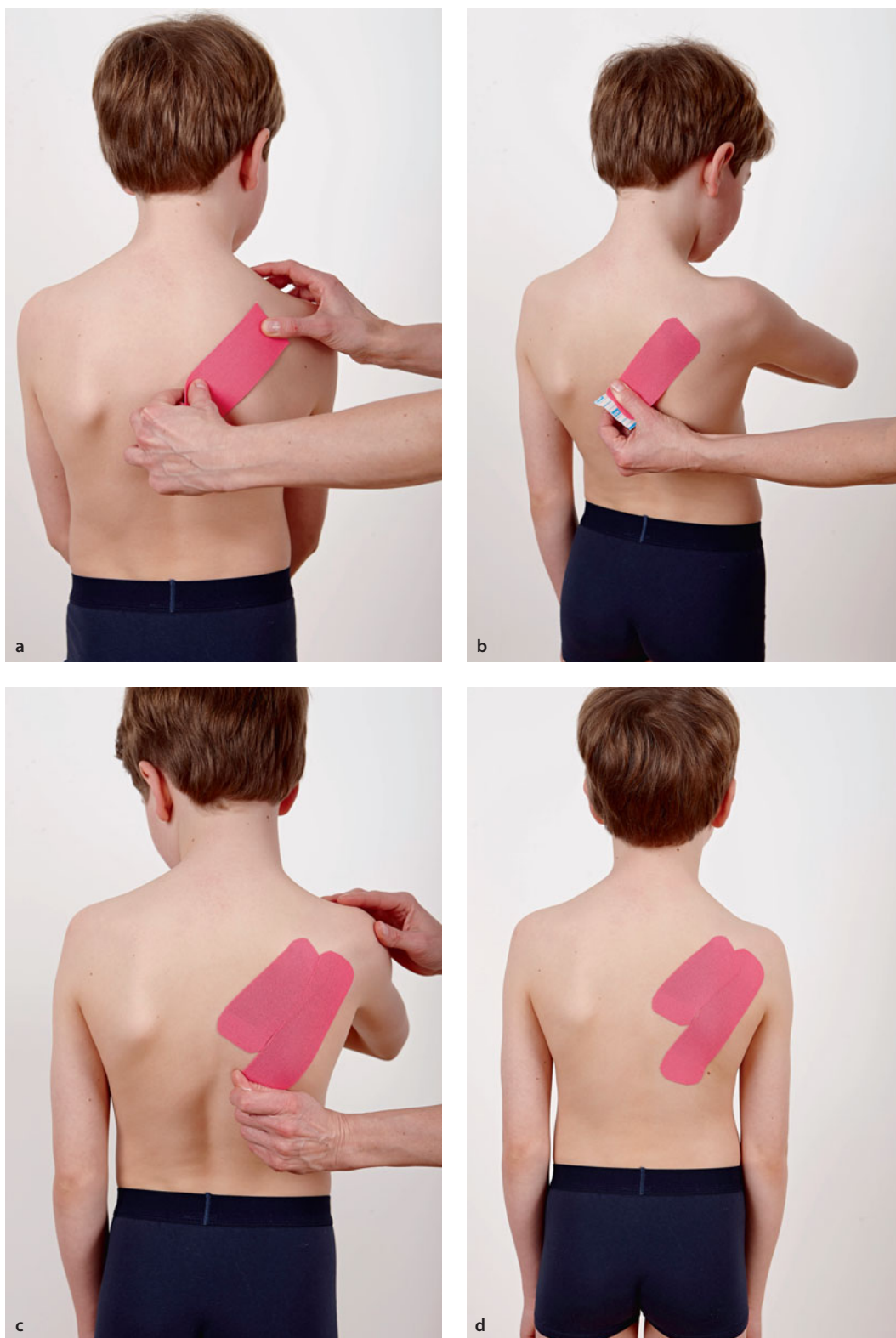


Fig. 3.26a–d Scapula integration. **a** Measurement of the tape from the spina scapulae to the mid-thoracic spine, **b** the first base lies on the medial spina scapulae, affix the tape with 50–75% tension over the scapula to the mid-thoracic spine, **c** the second tape strip lies laterally to the first, affix the tape with the same tension over the scapula to the lower thoracic spine, **d** completed fascial correction

3.3 Brachial Plexus Palsy

Brachial plexus palsy in children, sometimes known as obstetric brachial plexus palsy, is caused by damage to the brachial plexus during the birthing process. The trauma may result in motor deficits, loss of movement, or sensitivity, depending on the severity of the injury.

Of the five nerve roots of the brachial plexus, the top-most roots at C5–C6 are damaged most frequently. Weakness or paralysis resulting from damage to these nerves is known as Erb's palsy. Primarily the muscles of the shoulder and elbow joint are affected.

3.3.1 Scapula Alata

Paralysis of the musculature surrounding the scapula causes scapula alata (winged shoulder blade).

■ Goal

A fascial correction is applied to facilitate integration of the scapula on the thorax.

■ Application

Two tape strips are required for the application. The first tape is measured from the spina scapulae to the middle of the thoracic spine (■ Fig. 3.26a), the second from the spina scapulae to the lower thoracic spine.

The first base is placed medially on the spina scapulae, with the arm positioned in 90-degree flexion and adduction. The tape is affixed across the scapula to the thoracic spine with 50–70% tape tension (■ Fig. 3.26b). The tape ends are attached unstretched.

The second base is positioned laterally to the first, on the spina scapulae. The arm is once more in 90-degree flexion and adduction, the tape is affixed with 50–70% tension over the scapula to the lower thoracic spine (■ Fig. 3.26c). Attach the ends unstretched.

■ Fig. 3.26d illustrates the completed fascial correction.

Memo

Application: Fascial technique

Cutting technique: I-tape



Red I-tape

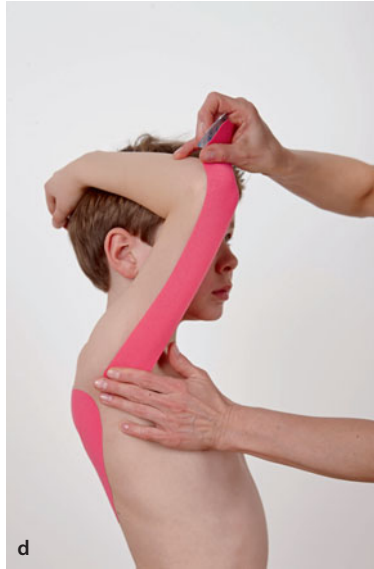
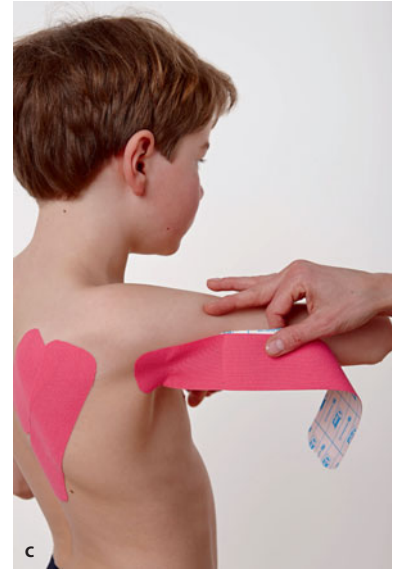
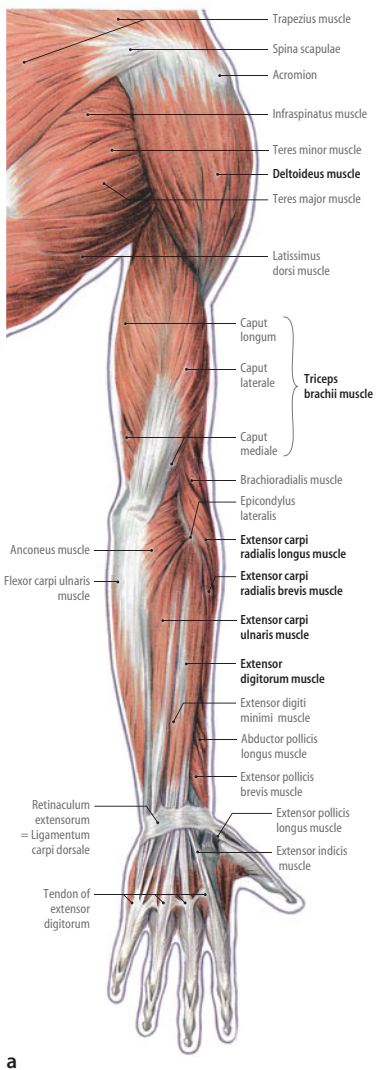


Fig. 3.27a–e Elbow extension. **a** Triceps brachii. (From Tillmann 2010). **b** Tape is measured from the olecranon to the upper shoulder blade, **c** the base is placed at the origin on the shoulder blade, **d** anchor the base with skin displacement, then affix the tape strip with 10% tension over the muscle to the insertion on the olecranon, **e** completed application

3.3.2 Elbow Extension Deficit

Insufficient activity of the m. triceps brachii limits elbow extension.

■ Goal

A tonus-stimulating muscle application to the **m. triceps brachii** (■ Fig. 3.27a) improves extension of the elbow joint.

Origin

- Caput longum: tuberculum infraglenoidale scapulae
- Caput mediale: distal from the radial sulcus, dorsal surface of the humerus, medial and lateral intermuscular septa
- Caput laterale: lateral and proximal from the radial sulcus, dorsal surface of the humerus, proximal from just below the tuberculum majus and ending distally at the septum intermusculare laterale

Insertion

Olecranon ulnae and posteriorly on the joint capsule

Function

Extension of the elbow joint, retroversion and adduction of the arm

Innervation

Radial nerve (C6–C8)

■ Application

The tape length is measured from the olecranon to the upper shoulder blade (■ Fig. 3.27b) with the arm in shoulder and elbow flexion. In a resting position, the base is placed at the origin on the shoulder blade (■ Fig. 3.27c). The muscle is pre-stretched and the base affixed with skin displacement. Then affix the tape over the muscle belly to the insertion on the olecranon with 10% tape tension (■ Fig. 3.27d). Rub the tape while in the pre-stretched position. ■ Fig. 3.27e illustrates the completed tonus-stimulating muscle application to the triceps brachii, combined with the application for scapula integration.

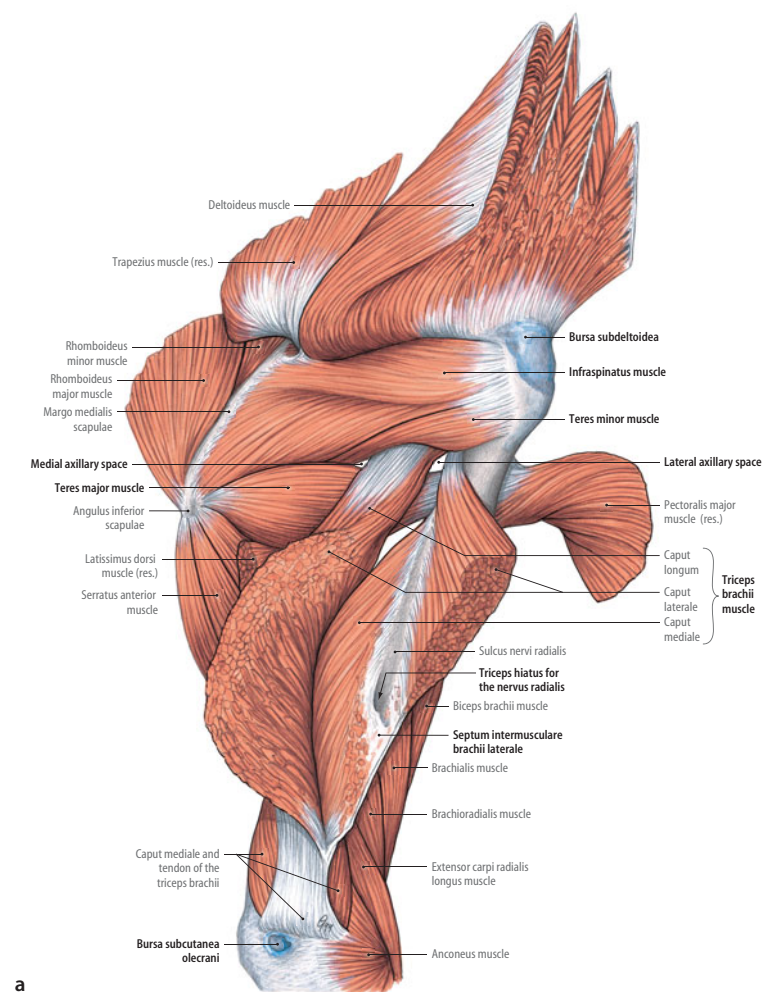
Memo

Application: Muscle technique

Cutting technique: I-tape



Red I-tape



a



b



c



d



e

Fig. 3.28a–e Tonus-stimulating muscle application to the m. infraspinatus. **a** M. infraspinatus. (From Tillmann 2010). **b** Measure the tape in the pre-stretched position, from the margo medialis scapulae to the tuberculum majus, **c** the base lies at the origin at the fossa infraspinata, **d** affix the tape strip with 10% tension over the muscle belly to the insertion on the tuberculum majus, **e** completed application

3.3.3 Shoulder Internal Rotation

Insufficient activity of the infraspinous muscles causes internal rotation at the shoulder joint.

■ Goal

A tonus-stimulating muscle application to the **m. infraspinatus** (■ Fig. 3.28a) is used to improve external rotation at the shoulder joint.

Origin

Fossa infraspinata, caudal border of the spina scapulae

Insertion

Middle facet of the tuberculum majus

Function

External rotation and abduction at the glenohumeral joint, tenses and reinforces the joint capsule

Innervation

Suprascapularis (plexus brachialis, pars supraclavicularis)

■ Application

With the arm adducted and internally rotated, the tape length is measured from the margo medialis scapulae to the tuberculum majus (■ Fig. 3.28b).

While in the resting position, the base is attached to the origin at the fossa infraspinata (■ Fig. 3.28c). The muscle is then pre-stretched and the base anchored with skin displacement. Affix the tape with 10% tension over the muscle belly to the insertion on the tuberculum majus (■ Fig. 3.28d). Rub the tape while in the pre-stretched position. ■ Fig. 3.28e illustrates the completed muscle application to the m. infraspinatus.

Memo

Application: Muscle technique

Cutting technique: I-tape



Red I-tape



Fig. 3.29a–d Fascial correction to the forearm. **a** The tape length is measured in two spirals around the forearm, from the center of the wrist to the elbow, **b** the base lies on the volar wrist crease, **c** affix the tape strip with 50% tension on the volar aspect and 20% tension on the dorsal aspect of the forearm, **d** completed fascial correction

3.3.4 Forearm Pronation

Insufficient activity of the supination muscles causes an internally rotated position of the forearm.

- **Goal**

A fascial correction to the forearm increases supination of the forearm.

- **Application**

The tape length is measured in one or two spirals (depending on arm length) around the forearm, from the center of the wrist to the elbow joint (■ Fig. 3.29a).

The base is attached to the crease on the volar aspect of the wrist, thereafter the arm is corrected into supination (■ Fig. 3.29b). The tape is affixed in a spiraling action around the forearm, with varying tension: 50% tension is used on the volar aspect of the arm, 20% tension on the dorsal aspect (■ Fig. 3.29c) to avoid pinching the arm. The tape end is attached unstretched over the elbow (■ Fig. 3.29d illustrates the completed fascial application for supination of the forearm.

Memo

Application: Fascial technique

Cutting technique: I-tape



Red I-tape



Fig. 3.30a–f Wrist correction using combined functional and fascial corrective applications. **a** The tape length is measured from the palm of the hand to halfway up the forearm, **b** the base lies slightly distal to the dorsal wrist crease, **c** affix the Y-tape strip using functional correction with 50% tension between thumb and forefinger, **d** 20% tape tension on the outside margin of the hand, **e** affix the I-tape strip over the forearm using a fascial technique to correct the hand position, **f** completed combined application

3.3.5 Palmar Flexion Posture

Insufficient activity of the forearm extensors causes palmar flexion posture of the hand.

■ Goal

A variety of corrective techniques may be used to improve dorsal extension of the hand. Two options for tape applications will be described.

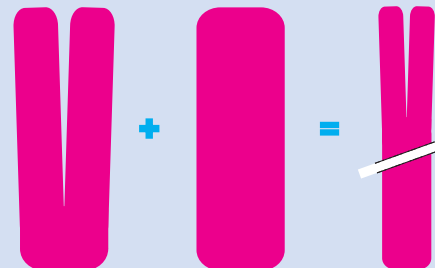
Combined Functional and Fascial Correcting Applications

The tape length is measured from the palm of the hand to halfway up the forearm (■ Fig. 3.30a), with the hand in palmar flexion. After measuring, narrow the tape by a quarter width and cut one end into Y-tape form. Tear the backing paper at the divided end, which will form the base. The base is then attached slightly distal to the dorsal wrist crease (■ Fig. 3.30b). The two Y-tape tails are used to effect a functional correction of the hand. The base is anchored with skin displacement and the hand positioned in dorsal extension. To reinforce radial abduction, the inner tape tail can be affixed with 50% tension between the thumb and forefinger (■ Fig. 3.30c). The second tape tail is affixed laterally with only 20% tension (■ Fig. 3.30d). Following the functional correction, a fascial technique is used to correct the entire hand dorsally with 50% tape tension (■ Fig. 3.30e). The end of the tape is attached unstretched. ■ Fig. 3.30f illustrates the completed application.

Memo

Application: Functional correction and fascial technique

Cutting technique: I-tape with transition to Y-tape



Red combined Y/I-tape



Fig. 3.31a–g Wrist correction using fascial correction and ligament application. **a** The base lies slightly distal to the dorsal wrist crease, **b** affix Y-tape strips unstretched to the palm of the hand to form the base, **c** the I-tape strip is attached using a fascial technique over the forearm, with a correction of the hand position, **d** measurement of the tape strip in a loop from the dorsal wrist crease around the hand and back, **e** the base is at the middle of the tape and is affixed to the center of the palm, the lateral tape strip is affixed with 20% tension over the edge of the hand to the wrist, **f** the medial tape strip is affixed with 50% tension between thumb and forefinger, and to the wrist, **g** completed combined application

Combined Fascial Technique and Ligament Technique

Fascial Technique (1. Corrective Tension)

The first tape is measured from the palm of the hand to halfway up the forearm, with the hand in palmar flexion. After measuring, narrow the tape by a quarter width and cut one end into Y-tape form. The backing paper is torn at the divided end to create the base, which is then attached slightly distal to the dorsal wrist crease (■ Fig. 3.31a). The two Y-tape tails are affixed to the palm to create the base (■ Fig. 3.31b). The hand is corrected in dorsal extension, and the tape affixed with 50% tension over the dorsal aspect of the forearm (■ Fig. 3.31c).

Ligament Technique (2. Corrective Tension)

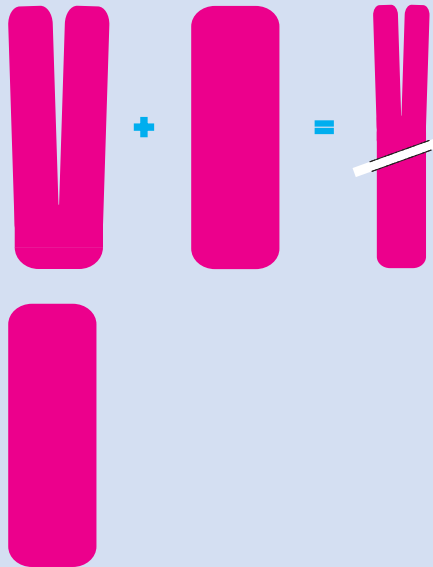
To strengthen the effect, a second tape strip is affixed using a ligament technique. The tape is measured in a loop around the hand to the center of the wrist (■ Fig. 3.31d). The backing tape is torn in the middle and the base lies at the center of the palm. The lateral tape strip is affixed over the side and onto the back of the hand using 20% tension (■ Fig. 3.31e). To reinforce radial abduction, the medial tape strip is affixed with 50% tension between the thumb and forefinger, to the back of the hand (■ Fig. 3.31f). The end of the tape is attached unstretched.

■ Fig. 3.31g illustrates the completed combined fascial correction and ligament technique for the hand.

Memo

Application: Fascial technique and ligament technique

Cutting technique: I-tape with transition into a Y-tape, and I-tape



Red combined Y/I-tape and I-tape



Fig. 3.32a–d Fascial correction for the thumb. **a** Measure the tape strip from the palm of the hand to mid-forearm, **b** place the pre-cut hole over the thumb, **c** correct the thumb and affix the tape with 75% tension over the back of the hand and dorsal forearm, **d** completed fascial technique

3.4 Infantile Cerebral Palsy

Brain damage in early childhood results in nervous system dysfunction and muscle disorders. Although spasticity and muscle hypertonus are the most common symptoms, atetotic or atactic forms also occur.

The causes may be congenital anomalies, prenatal infection, perinatal complications, inflammation, or trauma. Forms include hemiparesis, diparesis, and tetraparesis.

3.4.1 Spastic Thumb-in-Palm Deformity

Spasticity of the hand musculature causes flexion–adduction of the thumb.

■ Goal

A fascial correction is used to correct the position of the thumb.

■ Application

The tape length is measured from the palm to the middle of the forearm (■ Fig. 3.32a). One tape end is folded across, and a triangle is cut from the folded side (► Sect. 3.1.1). The hole created is then placed over the thumb (■ Fig. 3.32b) and the assistance of a second therapist is usually required for the correction of the thumb position. The tape is then affixed with 75% tension over the back of the hand and the dorsal aspect of the forearm (■ Fig. 3.32c). The tape end is attached unstretched. ■ Fig. 3.32d illustrates the completed fascial technique.

Memo

Application: Fascial technique

Cutting technique: I-tape with hole at one end



Red I-tape with hole at one end

! Tip

Holes are frequently made too large, as the tape is subsequently stretched. Therefore keep the hole small initially, and enlarge later if necessary.



Fig. 3.33a–e Fascial correction of the hand in dorsal extension. **a** Measure the tape length from the palm of the hand to mid-forearm, **b** place the pre-cut holes over the 3rd and 4th fingers, **c** affix the tape with 75% tension over the back of the hand and dorsal forearm, **d,e** completed fascial technique

3.4.2 Spastic Hand Deformity

Spasticity of the forearm musculature causes palmar flexion of the hand.

■ Goal

A fascial correction is used to correct the hand in dorsal extension.

■ Application

The tape length is measured from the palm of the hand to the middle of the forearm (■ Fig. 3.33a). The hand is placed in palmar flexion. One tape end is folded across, and two triangles are cut out of the folded side (► Sect. 3.1.1).

The holes created are then placed over the 3rd and 4th fingers (■ Fig. 3.33b), and the assistance of a second therapist is usually required for the correction of the fingers. Following the correction, the tape is affixed with 75% tension over the back of the hand and the dorsal aspect of the forearm (■ Fig. 3.33c). The tape end is attached unstretched. ■ Fig. 3.33d and ■ Fig. 3.33e illustrate the completed fascial technique.

Memo

Application: Fascial technique

Cutting technique: I-tape with two holes



Red I-tape with two holes

! Tip

Holes are frequently made too large, as the tape is subsequently stretched. Therefore keep the hole small initially, and enlarge later if necessary.

! Tip

It is possible to combine the corrective applications for the hand and thumb.



Fig. 3.34a–e Spastic talipes equinus, combination of muscle and ligament technique. **a** Affix the individual tape tails around the muscle belly with 10% tape tension, **b** completed muscle application, **c** affix the tape strip over the Achilles tendon with 75% tape tension; attach the tape end unstretched across the muscle, **d** using 75% tension, affix the tape en bloc beneath the heel and over the two malleoli, then attach the tape ends unstretched, **e** completed combined application

3.4.3 Spastic Talipes Equinus

■ Goal

A tonus-reducing muscle application to the gastrocnemius is combined with a ligament application to the Achilles tendon and ankle, to relax the calf musculature and correct the position of the foot.

Tonus-Decreasing Muscle Application to the M. Gastrocnemius

With the maximum possible dorsiflexion of the foot, the tape length is measured from beneath the heel to the femoral condyles. The tape is cut into a long Y-tape. Important: the base must be longer than two finger widths, as it should be affixed around the calcaneus. In the resting position, the base is affixed beneath the heel and up to the insertion of the Achilles tendon. Pre-stretch the muscle, then anchor the base with skin displacement and affix the individual calf strips with 10% tension around the muscle belly (■ Fig. 3.34a). Attach the tape ends to the femoral condyles unstretched. ■ Fig. 3.34b illustrates the completed muscle application.

Memo

Application: Muscle technique
Cutting technique: Y-tape



Blue Y-tape

Ligament Application to the Achilles Tendon

With maximum available dorsiflexion of the foot, the tape length is measured from beneath the heel to the musculotendinous junction of the gastrocnemius. The base lies over the first application under the heel, and extends to the insertion of the Achilles tendon. Maximally pre-stretch the muscle and anchor the base with skin displacement, then affix the tape with 75% tension over the Achilles tendon to the musculotendinous junction (■ Fig. 3.34c). Attach the tape end over the muscle unstretched.

Memo

Application: Ligament technique
Cutting technique: I-tape



Red I-tape

Ligament Application Around the Malleoli

Measured with the foot in the maximum available dorsiflexion, the tape is long enough to cover the two malleoli and the sole of the foot beneath the heel. Using 75% tension, the tape is affixed en bloc beneath the heel and over the malleoli (■ Fig. 3.34d). Attach the ends unstretched. ■ Fig. 3.34e illustrates the completed application for spastic talipes equinus.

Memo

Application: Ligament technique
Cutting technique: I-tape



Red I-tape

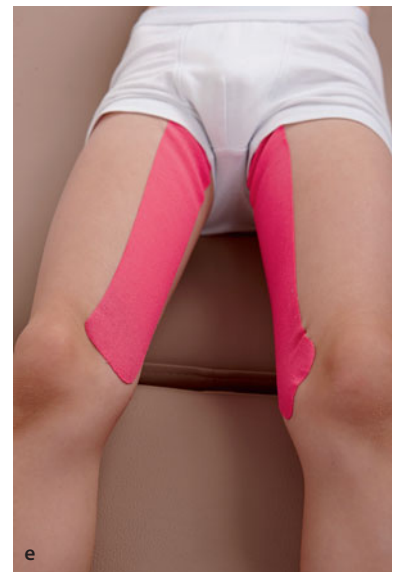
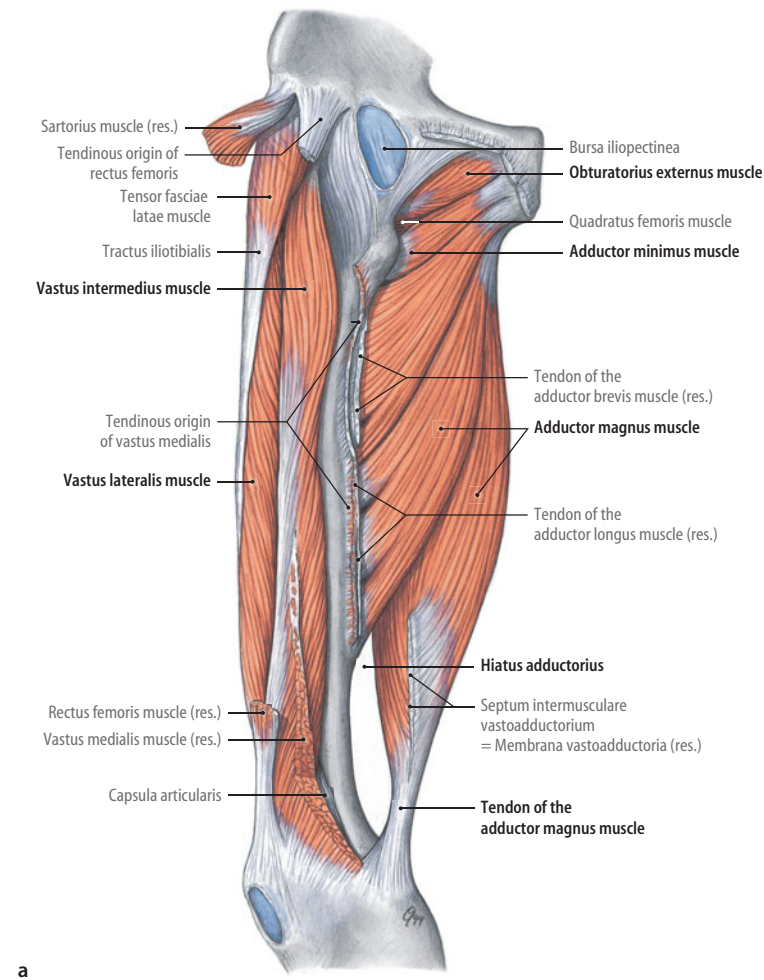


Fig. 3.35a–e Muscle application to the m. adductor magnus. **a** M. adductor magnus. (From Tillmann 2010). **b** Measure the tape strip from the ramus inferior ossis pubis to the epicondylus medialis, **c** the base lies at the ramus inferior ossis pubis, **d** affix the tape strip over the muscle belly to the insertion at the epicondylus medialis, using 10% tension, **e** completed bilateral muscle application

3.5 Spina Bifida

The term *spina bifida* refers to a congenital disorder caused by malformation of the embryonic neural tube. We can differentiate between two forms:

- Spina bifida occulta (hidden)
- Spina bifida aperta (visible)

The physical impairments experienced may vary greatly, depending on the severity of the damage to the spinal cord.

The following K-Taping applications are used to treat spina bifida:

- For inactive musculature: tonus-increasing muscle application
- For joint malformations: corrective technique
- For scar tissue: ligament technique

Memo

Application: Muscle technique

Cutting technique: I-tape



Red I-tape

3.5.1 Inactive Musculature

■ Goal

Muscle activation is stimulated using a bilateral muscle application to the **adductor magnus** (■ Fig. 3.35a).

Origin

Anterior surface of the ramus inferior ossis pubis, the ramus ossis ischii to the tuber ischiadicum

Insertion

One part attaches to the medial lip of the linea aspera, the other forms a tendinous attachment to the tuberculum adductorium of the epicondylus medialis femoris

Function

Powerful adductor, active in hip extension

Innervation

Obturator and tibial nerves (L3–L5)

■ Application

The tape length is measured from the epicondylus medialis to the ramus inferior ossis pubis, with the leg abducted (■ Fig. 3.35b). The base lies at the ramus inferior ossis pubis (■ Fig. 3.35c). The tape is affixed with skin displacement and 10% tape tension, over the muscle belly to the epicondylus medialis (■ Fig. 3.35d). Rub the tape while pre-stretched. Repeat the application to the other leg. ■ Fig. 3.35e illustrates the completed muscle application.



Fig. 3.36a–d Spacetape. **a** The tape is 1.5–2 boxes in length, depending on the size of the child, **b** affix the first tape strip en bloc, horizontally across the scar with 75% tape tension, **c** affix the second tape strip at a 90-degree angle to the first, **d** completed Spacetape application with four tape strips

3.5.2 Scar Tissue

■ Goal

A Spacetape application is made to the scar tissue in the lumbar region, to mobilize the tissue and improve blood flow.

■ Application

The tape strip is 1.5–2 boxes in length, depending on the size of the child (■ Fig. 3.36a). A total of four tape strips are cut. The trunk is in maximum flexion. The tape strips are affixed en bloc over the scar, with 75% tape tension (■ Fig. 3.36b).

The first tape strip is affixed horizontally across the lumbar spine, and the tape ends are attached unstretched. The second tape is attached at a 90-degree angle to the first (■ Fig. 3.36c). The application technique is repeated for the diagonal tape strips. ■ Fig. 3.36d illustrates the completed Spacetape application.

Memo

Application: Ligament technique

Cutting technique: I-tape



Red I-tape

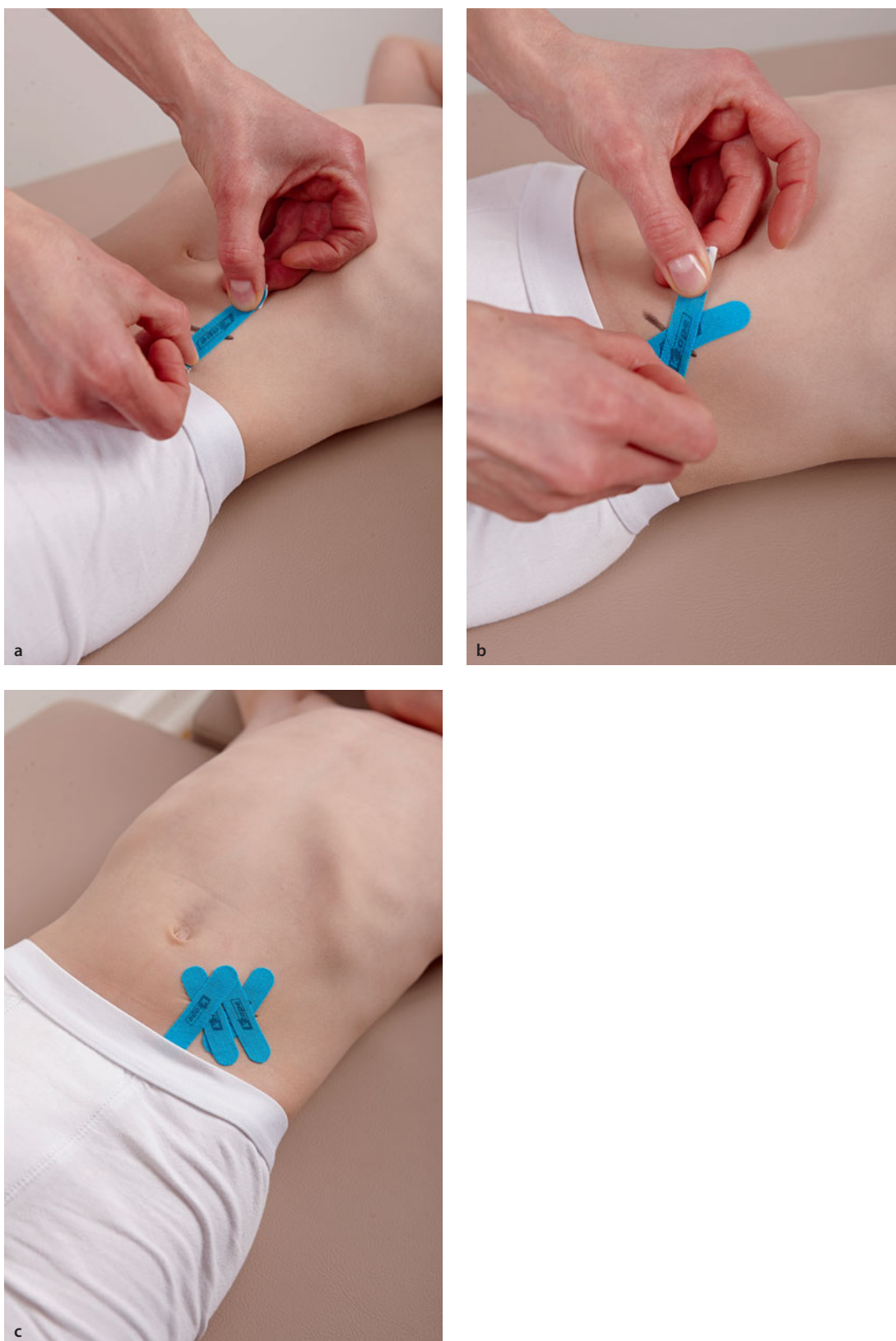


Fig. 3.37a–c Ligament technique. **a** Affix the first narrow tape strip en bloc at a 45-degree angle to the scar using maximum tension, **b** affix the second strip using the same technique to form a cross, **c** completed application

3.6 Scar Treatment

A build-up of fibrous tissue or scarring may be a result of surgery, burns, or accidental injury.

There are two application options for the treatment of scarring:

- Ligament technique
- Crosstape

■ Goal

A ligament technique and a Crosstape application are used to avoid alterations to tissue and the formation of scars.

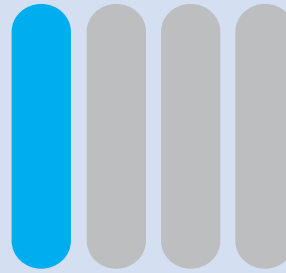
■ Application 1: Ligament Technique

The tape length is measured by placing the tape over the scar, allowing an extra finger width (the child's) in length at either end. The tape is then quartered lengthwise. Two of the narrow tape strips are affixed en bloc with maximum tape tension, at a 45-degree angle to the scar creating an X shape (■ Fig. 3.37a,b). The application is repeated at short intervals along the full length of the scar, with the scar site pre-stretched. ■ Fig. 3.37c illustrates the completed application.

Memo

Application: Ligament technique

Cutting technique: Quartered I-tape



Blue I-tape, quartered

! Tip

For better durability or to increase effectiveness, an additional ligament technique can be affixed over the application (I-tape, not quartered). The covering is placed across the scar, either with maximum tension or simply without tension. If it is not possible to cover the scar completely with one tape strip, two or more strips can be affixed alongside each other.



All stitches should be removed and the scar completely healed before the K-Tape treatment begins.



■ Fig. 3.38a–c Crosstape application. a First Crosstape applied to the scar, b second Crosstape application, c completed application

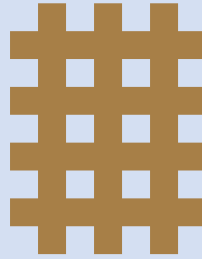
■ Application 2: Crosstape

The Crosstape is removed from the backing paper and held above the scar in different directions and at minimal distance from the skin, until it is drawn toward the skin optimally and can then be affixed (■ Fig. 3.38a). If the scar is larger than the tape, the application is repeated with additional Crosstapes spaced at intervals, until the scar is completely covered (■ Fig. 3.38b). ■ Fig. 3.38c illustrates the completed Crosstape application.

Memo

Application: Crosstape

Cutting technique: Crosstape



Crosstape



Fig. 3.39a–d Ligament application to the patellar tendon. **a** Measure the tape strip from tibial tuberosity to just above the patella, with the knee in maximum flexion, **b** the base lies at the tibial tuberosity, **c** anchor the base with skin displacement and affix the tape with 75% tension over the patellar tendon to the apex, attaching the tape end unstretched over the patella, **d** completed ligament application

3.7 Disorders of the Knee

3.7.1 Osgood–Schlatter Disease

Osgood–Schlatter disease typically occurs during the pre-pubescent growth period, most frequently affecting boys, particularly those who participate heavily in sporting activities that stress the knee joint.

Overstressing the patellar tendon causes micro-injuries at the insertion on the tibia. In some cases flakes of bone may become detached and die off (aseptic necrosis). The symptoms are pain during activity and tenderness of the patellar tendon insertion during palpation.

■ Goal

A ligament application to the patellar tendon provides relief and reduces pain at the knee joint.

■ Application

The tape length is measured from the tuberositas tibiae to just above the patella, with the knee in maximum flexion (■ Fig. 3.39a). Affix the base to the tuberositas tibiae with the knee extended, then bend the knee fully (■ Fig. 3.39b). Anchor the base well with skin displacement and affix the tape with 75% tension over the patellar tendon to the apex (■ Fig. 3.39c). Attach the tape ends unstretched over the patella. Rub the tape thoroughly. ■ Fig. 3.39d illustrates the completed application.

Memo

Application: Ligament technique

Cutting technique: I-tape



Red I-tape



Fig. 3.40a–f Functional correction of the patella. **a** Measure the two tape strips from the medial femoral condyle, over the patella to the lateral border, **b** the base lies medial and proximal to the vastus medialis, **c** affix the upper tape tail with 75% tension over the patella to the lateral border, while flexing the knee, **d** affix the lower tape tail slightly transposed over the patella, using the same technique, **e** with the base affixed at the pes anserinus, apply the tape with 75% tension over the patella to the lateral border, while flexing the knee, **f** completed functional correction of the patella

3.7.2 Patellar Misalignment

Retropatellar pain in children, particularly girls, may be caused by patellar misalignment. The misalignment itself may be due to a genetic predisposition or a result of muscle imbalances.

■ Goal

A functional correction is applied, to bring the patella into the correct physiological position. When combined with targeted physiotherapy to support the affected muscles, imbalances can be rectified.

■ Application

Two tape strips are required for the application. Both tape lengths are measured from the medial femoral condyle over the patella to the lateral border, with the knee extended (■ Fig. 3.40a).

The knee is placed in the zero-degree position for the **application of the first Y-tape**, and the base is affixed medial and proximal to the vastus medialis (■ Fig. 3.40b). With the backing paper still attached, both tape tails are placed on the skin in the direction of the correction. The base is then anchored with maximal skin displacement, while the patient moves the knee slowly from the zero position into flexion (■ Fig. 3.40c). During this movement, the upper tape tail is affixed with 75% tension over the patella to the lateral border. With the knee in maximum flexion, attach the tape end without stretch. Return the knee joint to the zero position, then affix the lower tape tail slightly transposed over the patella, using the same technique (■ Fig. 3.40d).

The knee is once again placed in the zero position for the **application of the second Y-tape**. Affix the base medial and distal to the pes anserinus. The upper tape tail is then affixed during movement of the joint in the same way as the first Y-tape, over the patella to the lateral border, with maximum tape tension (■ Fig. 3.31e). The lower tape strip is affixed unstretched, with the knee in maximum flexion.

■ Fig. 3.40f illustrates the completed application.

Memo

Application: Functional correction

Cutting technique: Y-tape



Red Y-tape

! Tip

The skin should be shifted strongly in the direction of pull from the thigh, to ensure maximum freedom of movement for the knee joint.

! Tip

It may be useful to combine the functional correction with a further muscle application, to provide an additional stimulus to the vastus medialis.



Fig. 3.41a–e Ligament application to the lower ribcage. **a** Measure the first tape strip from armpit to armpit, **b** the base lies centrally at the processus xiphoideus, **c** affix the tape strips over the costal arch to the right and left simultaneously, with 75% tension, **d** affix the base of the second strip centrally at T12, **e** completed ligament application

3.8 Pulmonary Disease

Bronchial asthma and chronic bronchitis are among the most common chronic lung conditions in childhood and adolescence.

In both bronchial asthma and chronic bronchitis, a variety of triggers such as allergens, respiratory infection, and passive smoke inhalation lead to increased mucus production and muscle spasms restricting the airway. The symptoms include coughing, increased phlegm, and shortness of breath when under physical stress. In both conditions, primarily expiration is impaired.

■ Goal

A ligament application to the lower ribcage provides relief and facilitates exhalation.

■ Application

Two tape strips are required for the application. The first tape strip is measured from the right to the left armpit, at the height of the costal arch (■ Fig. 3.41a); the second strip is measured across the back of the thorax, from the right to the left armpit at the same level as the first.

The base of the **first tape strip** lies centrally at the processus xiphoideus (■ Fig. 3.41b). The arm is in flexion and the patient inhales deeply during the application. The tape is simultaneously affixed over the costal arch to the right and left, with 75% tape tension (■ Fig. 3.41c). Attach the tape ends unstretched.

The base of the **second tape strip** is affixed centrally at T12. The arm is in maximum flexion and the patient inhales once more. The tape is affixed to the posterior inferior ribcage, repeating the process used previously (■ Fig. 3.41d). Attach the tape ends unstretched.

■ Fig. 3.41e illustrates the completed ligament application.

Memo

Application: Ligament technique

Cutting technique: I-tape



Red I-tape

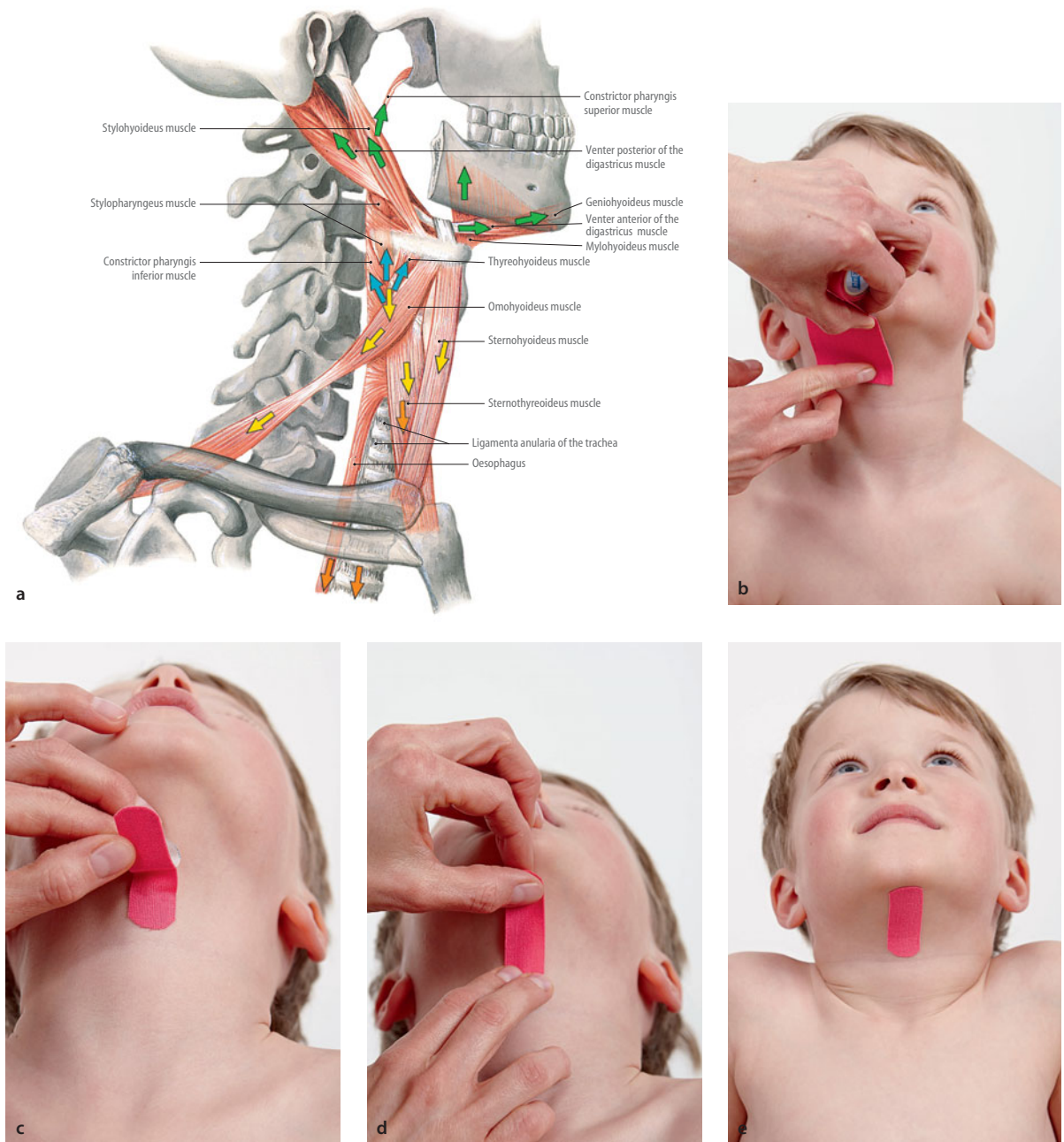


Fig. 3.42a–e Tonus-stimulating muscle application to the m. geniohyoideus. **a** M. geniohyoideus. (From Tillmann 2010). **b** Measure the tape length from the hyoid bone to the mandible with the cervical spine in extension, **c** the base lies at the mandible, **d** anchor the base with skin displacement and affix the tape over the muscle belly to the hyoid bone using 10% tape tension, **e** completed muscle application

3.9 Dysphagia

Dysphagia is a disorder of the swallowing mechanism, and refers to difficulties ingesting and transporting food as well as the act of swallowing itself.

Motor control of the mouth as well as awareness or sensitivity of the face, mouth cavity, and throat can all be affected by dysphagia. Possible causes include: premature birth; congenital swallowing dysfunction; an unphysiological position of the head or posture; permanent mouth breathing; enlarged tonsils or polyps; thumb sucking; perceptual disorders; congenital or acquired brain damage; tumors in the mouth cavity or throat. Symptoms such as hypersalivation and hyper-/hypotonus of the mouth region may occur. Applications can be combined, depending on the specific symptoms.

Memo

Application: Muscle application

Cutting technique: I-tape



Red I-tape, quartered

3.9.1 Swallowing Disorders

■ Goal

A tonus-stimulating application to the **m. geniohyoideus** (■ Fig. 3.42a) aids swallowing (base at the lower jaw).

Origin

Mandible at the symphysis menti

Insertion

Os hyoideum

Innervation

N. hypoglossus (C1–C2)

Function

If the hyoid bone is fixed:

- Bilateral: depression and retraction of the mandible
- Unilateral: ipsilateral lateral movement of the mandible

If the mandible is fixed:

- Moves the hyoid bone forward and upward

■ Application

With the cervical spine extended, the tape length is measured from the hyoid bone to the mandible (■ Fig. 3.42b). The tape is quartered lengthwise, and only one strip is required for the application. The base of the strip is affixed to the mandible, with the patient in a resting position (■ Fig. 3.42c). Anchor the base with skin displacement and pre-stretch the muscle, then affix the tape over the muscle belly using 10% tape tension (■ Fig. 3.42d). ■ Fig. 3.42e illustrates the completed muscle application to the geniohyoideus.



Fig. 3.43a–c Ligament application to the floor of the mouth. **a** Tape width corresponds to the width of the base of the tongue when the cervical spine is slightly extended, **b** affix tape strip en bloc over the base of the tongue, **c** completed application

3.9.2 Hypersalivation

The term *hypersalivation* describes an excessive production of saliva. This may be symptomatic of a number of conditions, including dysphagia and myofunctional disorder (► Sect. 3.10).

■ Goal

A ligament application to the floor of the mouth stimulates tone in the tongue, thereby improving the swallowing process.

■ Application

The tape width corresponds to the width of the base of the tongue when the cervical spine is slightly extended (■ Fig. 3.43a). The tape is halved in length, and only one half is required for the application. Affix the tape strip en bloc laterally across the base of the tongue (■ Fig. 3.43b). ■ Fig. 3.43c illustrates the completed ligament technique.

Memo

Application: Ligament technique

Cutting technique: I-tape



Red I-tape

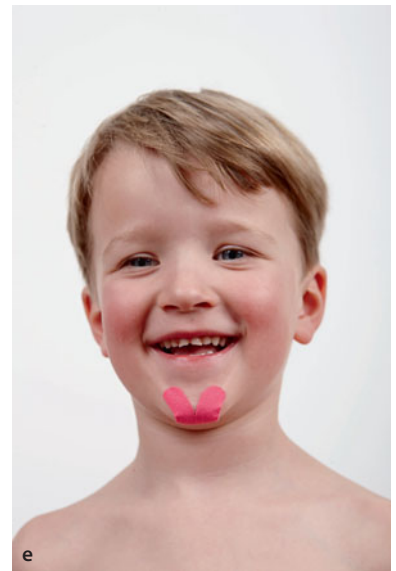
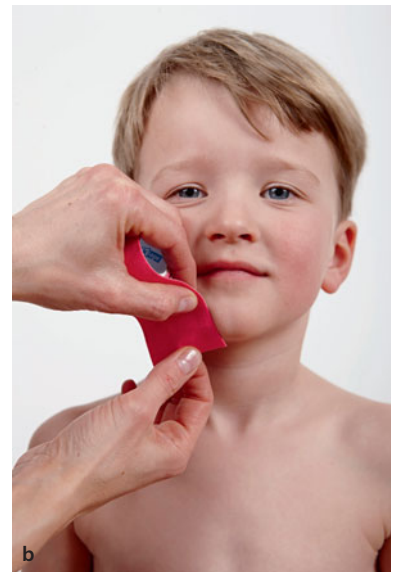
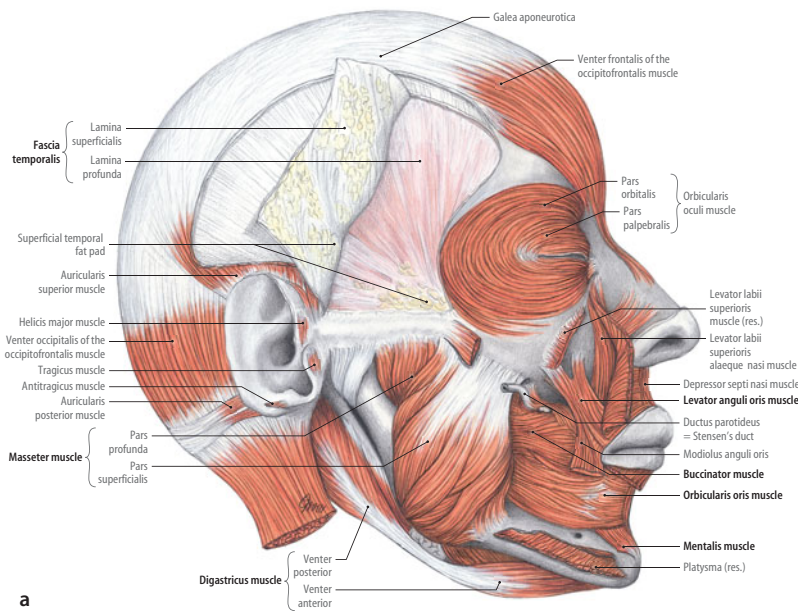


Fig. 3.44a–e Tonus-stimulating muscle application to the m. mentalis. **a** M. mentalis. (From Tillmann 2010). **b** Measure the tape length from the point of the chin to the furrow beneath the lip, **c** the base lies at the lip furrow, **d** anchor the base with skin displacement, and affix the Y-tape over the muscle belly with 10% tension, **e** completed tonus-stimulating muscle application

3.9.3 Hypotonus/Hypertonus of the Mouth Region

Hypotonus/hypertonus of the mouth region interferes with the act of swallowing.

■ Goal

An application to the **mentalis** muscle can assist in cases of hypo- or hypertonus of the mouth region (■ Fig. 3.44a), by either increasing or reducing muscle tension to improve swallowing.

- Hypotonus of the mouth region can be treated with a tonus-stimulating application to the mentalis muscle.
- Hypertonus of the mouth region can be treated with a tonus-reducing application to the mentalis muscle.

Origin

Incisive fossa on anterior aspect of the mandible

Insertion

Skin of the chin

Innervation

Ramus marginalis mandibulae of the n. facialis

Function

Elevates the skin of the chin, protrusion of the lower lip

Tonus-Increasing Muscle Application to the M. Mentalis

The tape is measured from the point of the chin to the furrow below the lip, with the musculature pre-stretched (■ Fig. 3.44b). The tape is halved lengthwise, and cut into Y-tape form. The bases are the two ends of the Y-tape. They are affixed to the lip furrow at the muscle origin (■ Fig. 3.44c). Anchor the base with skin displacement and attach the tape over the muscle belly to the insertion at the point of the chin, using 10% tape tension (■ Fig. 3.44d). Rub the tape thoroughly. ■ Fig. 3.44e illustrates the completed tonus-stimulating muscle application.

Memo

Anlage: Muscle technique

Cutting technique: Y-tape



Red Y-tape

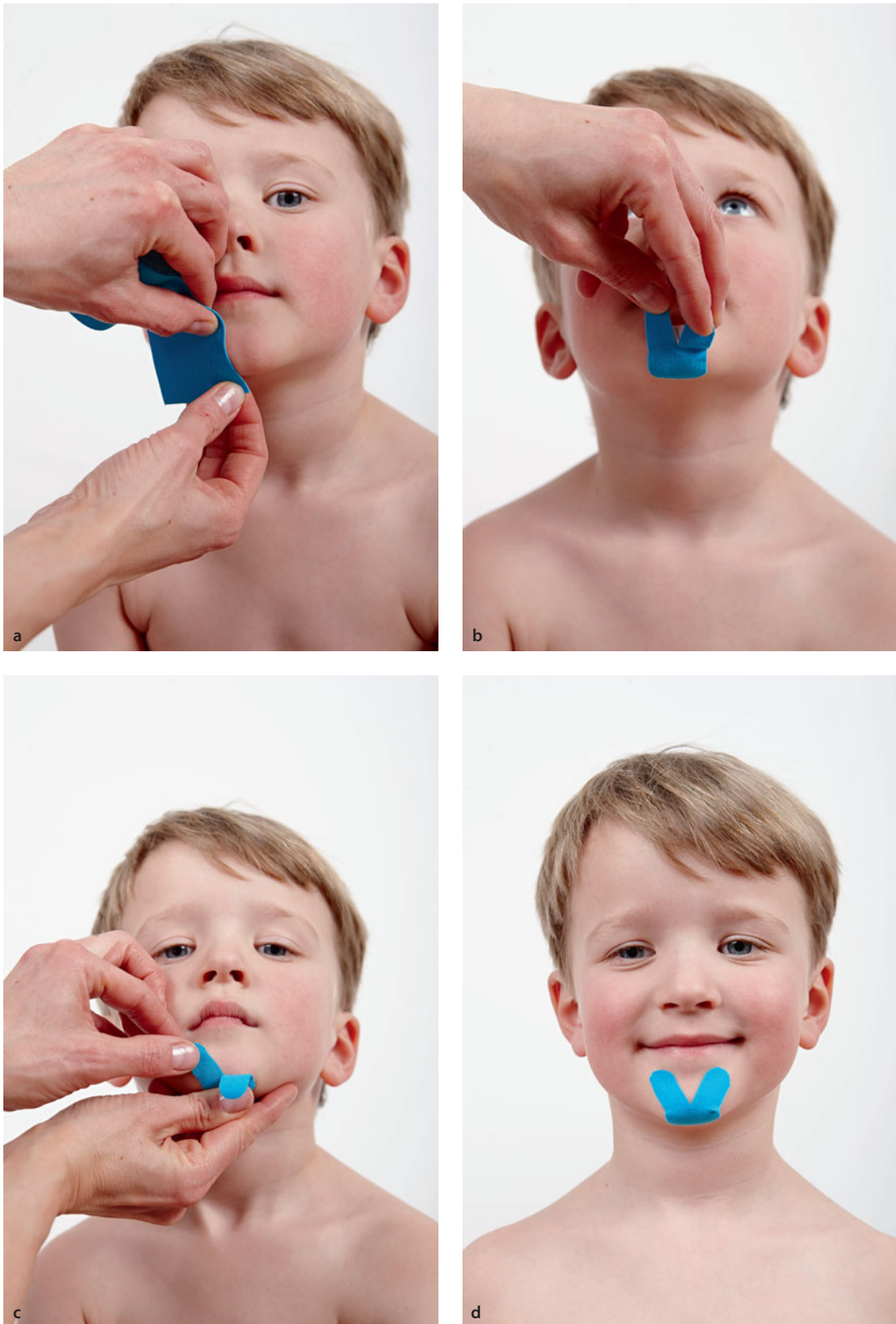


Fig. 3.45a–d Tonus-reducing muscle application to the m. mentalis. **a** Measure the tape strip from the point of the chin to the furrow below the lip, **b** the base lies at the point of the chin, **c** anchor the base with skin displacement and affix the Y-tape over the muscle belly to the lip furrow using 10% tape tension, **d** completed tonus-reducing muscle application

Tonus-Reducing Muscle Application to the M. Mentalis

The tape is measured from the point of the chin to the furrow below the lip, with the musculature pre-stretched (■ Fig. 3.45a). The tape is halved lengthwise, and cut into Y-tape form. The base lies at the point of the chin (■ Fig. 3.45b). Anchor the base with skin displacement and affix the tape over the muscle belly to the origin at the lip furrow, using 10% tape tension (■ Fig. 3.45c). Rub the tape thoroughly. ■ Fig. 3.45d illustrates the completed tonus-reducing muscle application.

Memo

Anlage: Muscle technique

Cutting technique: Y-tape



Blue Y-tape

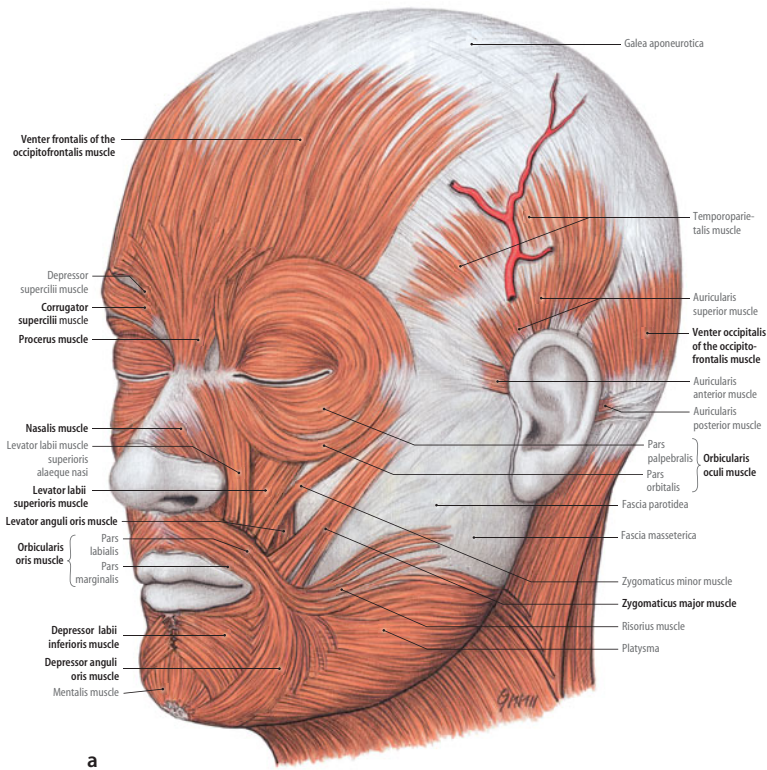


Fig. 3.46a–f Tonus-reducing muscle application to the m. orbicularis oris. **a** M. orbicularis oris. (From Tillmann 2010). **b** Measure the tape strip from the right to the left mouth corners, **c** the base of the first halved tape strip lies at the left mouth corner, **d** anchor the base with skin displacement and affix the tape above and to the center of the upper lip with 0% tension, **e** anchor the second tape strip with skin displacement and use the same technique to affix the tape to the upper lip, **f** completed tonus-reducing muscle application to the orbicularis oris of the upper lip only

3.10 Myofunctional Disorders

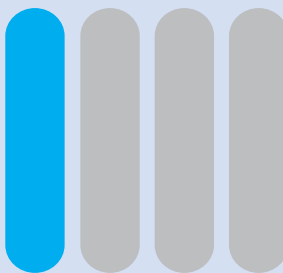
Myofunctional disorders are disorders of the internal and external mouth musculature. Movement patterns and coordinative processes are affected, in addition to the interrelationships of the muscular structures involved in swallowing.

The following symptoms may arise: open mouth posture; mouth breathing; increased saliva production (hyper-salivation, ► Sect. 3.9.2), sensory and motor deficits of the tongue; unphysiological positioning of the tongue when resting; forward displacement of the tongue when speaking and swallowing; imbalances of the musculature in general, throughout the mouth, face, and neck regions.

Memo

Application: Muscle technique

Cutting technique: Narrow I-tape



Blue I-tape, narrow

3.10.1 Shortened Upper Lip

Imbalances of the mouth musculature may cause a shortening of the upper lip.

■ Goal

A tonus-reducing application to the **m. orbicularis oris** (► Fig. 3.46a) alleviates tension in the upper lip.

Origin

Upper and lower jaw

Insertion

Skin of the lips

Innervation

N. facialis

Function

Narrows and closes the opening of the mouth, generates tension in the lips

■ Application

The tape length is measured generously, from the right to the left corner of the mouth (► Fig. 3.46b). A strip slightly less than a quarter of the initial width is cut, and this strip is then halved across. The base of the first small strip lies at the left mouth corner (► Fig. 3.46c). Anchor the base with skin displacement and attach the strip above the upper lip, with 0% tension (► Fig. 3.46d). Affix the base of the second strip at the right mouth corner and anchor with skin displacement (► Fig. 3.46e), then affix the tape over the upper lip with 0% tension. ► Fig. 3.46f illustrates the completed tonus-reducing muscle application to the orbicularis oris of the upper lip.



Fig. 3.47a–e Tonus-stimulating muscle application to the m. orbicularis oris. **a** Measure the tape length from the right to the left mouth corner, **b** the first base at the center of the tape is affixed to the middle of the upper lip, **c** anchor base with skin displacement to the right, and affix the tape end over the upper lip to the left mouth corner with 0% tension, **d** anchor the base with skin displacement to the left, then affix the other tape end over the upper lip to the right mouth corner as before, **e** completed tonus-reducing muscle application to the m. orbicularis oris

3.10.2 Open Mouth Posture

■ Goal

A tongue-stimulating application to the m. orbicularis oris improves closure of the mouth.

■ Application

The application consists of one tape above the upper lip, and a second tape beneath the lower lip. The tape length is measured generously, from the right to left mouth corners across the upper lip for the top tape (■ Fig. 3.47a), and in the same way over the lower lip for the bottom tape. A strip slightly less than a quarter of the width is cut lengthways from each tape.

The center of the tape forms the base for the **application to the upper lip**. The base is placed at the middle of the upper lip (■ Fig. 3.47b). Anchor the base first with skin displacement to the right against the direction of tape application, then affix one end of the tape above the upper lip to the left mouth corner, with 0% tension (■ Fig. 3.47c). Use the same technique to affix the other end of the tape to the right mouth corner (■ Fig. 3.47d).

The center of the tape is also the location of the base for the **application to the lower lip**. The base is placed at the middle of the lower lip. Anchor the base with skin displacement against the direction of tape application, then affix one end of the tape over the lower lip to the left mouth corner, with 0% tension, and the other tape end to the right mouth corner.

■ Fig. 3.47e illustrates the completed tonus-stimulating muscle application to the orbicularis oris.

Memo

Application: Muscle technique

Schnitttechnik: I-tape narrow



Red I-tape, quartered

! Tip

Considerable skin displacement is possible on the upper and lower lips; however, the additional tension from the tape would then be excessive.

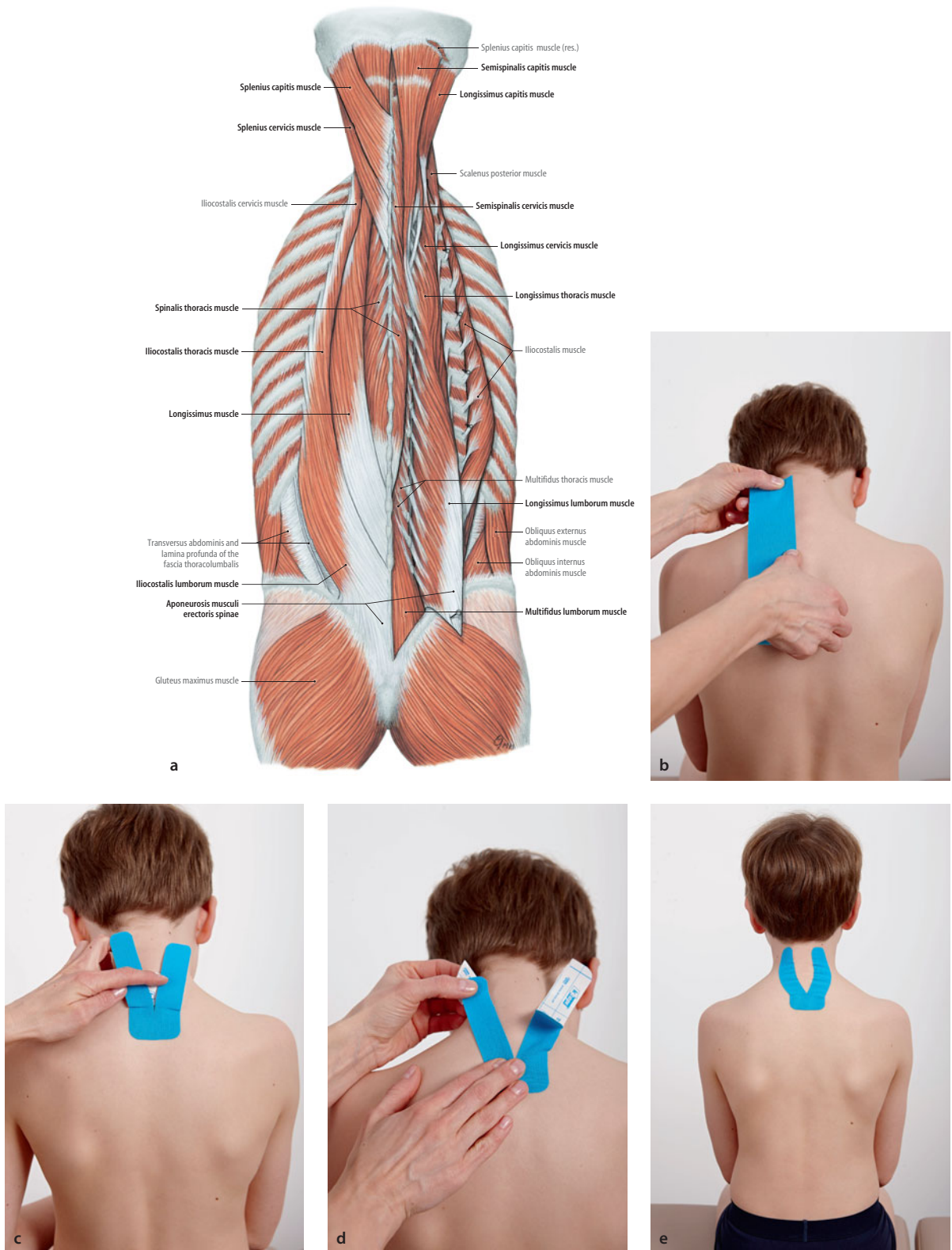


Fig. 3.48a–e Tonus-reducing muscle application to the m. semispinalis capitis. **a** M. semispinalis capitis. (From Tillmann 2010). **b** Measure the tape strip from T2 to the hairline with maximum cervical flexion, **c** the base lies at T2, **d** anchor the base with skin displacement and affix the Y-tape tails paravertebrally over the muscle belly with 0% tension, **e** completed muscle application

3.11 Headaches

Children suffer most frequently from primary headaches. Only around 10% of headaches can be linked to other diseases or conditions (secondary headaches). Primary forms include tension headaches and temporal headaches, which can be eased by means of a tape application.

3.11.1 Tension Headache

Almost two thirds of children affected by primary headaches suffer from tension headaches. The pain typically originates in the neck and spreads over the entire head and the pain is usually described as dull with a feeling of pressure.

■ Goal

Releasing tension in the shoulder and neck muscles relieves strain on the structures located in that area.

■ Application

The following muscles are treated, using a tonus-reducing muscle application:

- Semispinalis capitis
- Levator scapulae
- Trapezius descendens

A combination of muscle applications are used as follows.

Tonus-Reducing Muscle Application to the M. Semispinalis Capitis (■ Fig. 3.48a)

Origin

Transverse processes of the T4–T7 vertebrae and articular processes of the bottom C5 vertebrae

Insertion

Between the linea nuchae superior and inferior

Function

- Bilateral: neck extensor
- Unilateral: lateral flexion of the cervical spine

Innervation

Rami dorsales (T4–T6, C4–C6, and C1–C5)

■ Application

The tap length is measured from T2 to the hairline, with the neck in maximal flexion (■ Fig. 3.48b). The tape is cut into Y-tape form.

The base is affixed at T2, with the cervical spine slightly flexed (■ Fig. 3.48c). Anchor the base with skin displacement, then affix both tape tails with 0% tension, right and

left paravertebrally, up to the hairline (■ Fig. 3.48d). Rub the tape while pre-stretched. ■ Fig. 3.48e shows the completed muscle application to the m. semispinalis capitis.

Memo

Application: Muscle technique

Cutting technique: Y-tape



Blue Y-tape

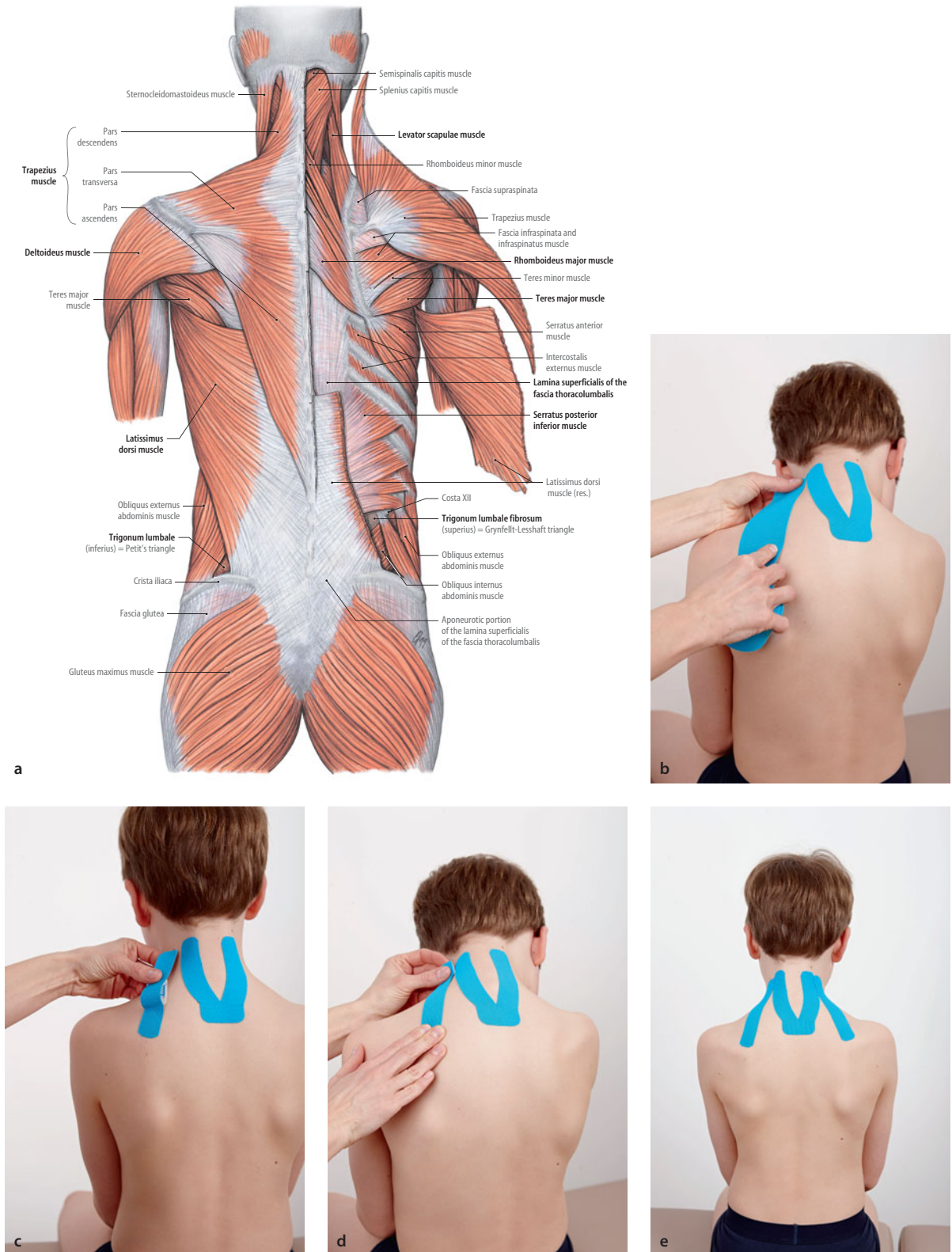


Fig. 3.49a–e Tonus-reducing muscle application to the m. levator scapulae. **a** M. levator scapulae. (From Tillmann 2010). **b** Measure the tape with the musculature pre-stretched, from the transverse process at the hairline to the angulus superior scapulae, **c** the base lies at the angulus superior scapulae, **d** anchor the base with skin displacement and affix the tape stretch over the muscle belly to the origin or hairline with 0% tape tension, **e** completed muscle application

Tonus-Reducing Muscle Application to the M. Levator Scapulae (■ Fig. 3.49a)

Origin

Transverse process of the C1–C4 vertebrae

Insertion

Angulus superior scapulae and adjoining portion of margo scapulae

Function

Scapula elevation with medial rotation of the angulus inferior

Innervation

N. dorsalis scapulae (C5–C6)

■ Application

The application consists of two tape strips (right and left). The tape is measured with cervical flexion and rotation to the contralateral side (direct the gaze to the opposite armpit), from the transverse process at the hairline to the angulus superior scapulae (■ Fig. 3.49b). Halve the tape lengthwise. The application is made to the right and left sides using the same method.

While in resting position, the base is affixed to the insertion at the angulus superior scapulae (■ Fig. 3.49c). The muscle is pre-stretched and the base anchored with skin displacement. Affix the tape over the muscle belly to the origin or hairline using 0% tape tension (■ Fig. 3.49d). Rub the tape while pre-stretched. Repeat the process on the other side. ■ Fig. 3.49e illustrates the completed application, in combination with the application to the m. semi-spinalis capitis.

Memo

Application: Muscle technique

Cutting technique: I-tape halved



Blue I-tape

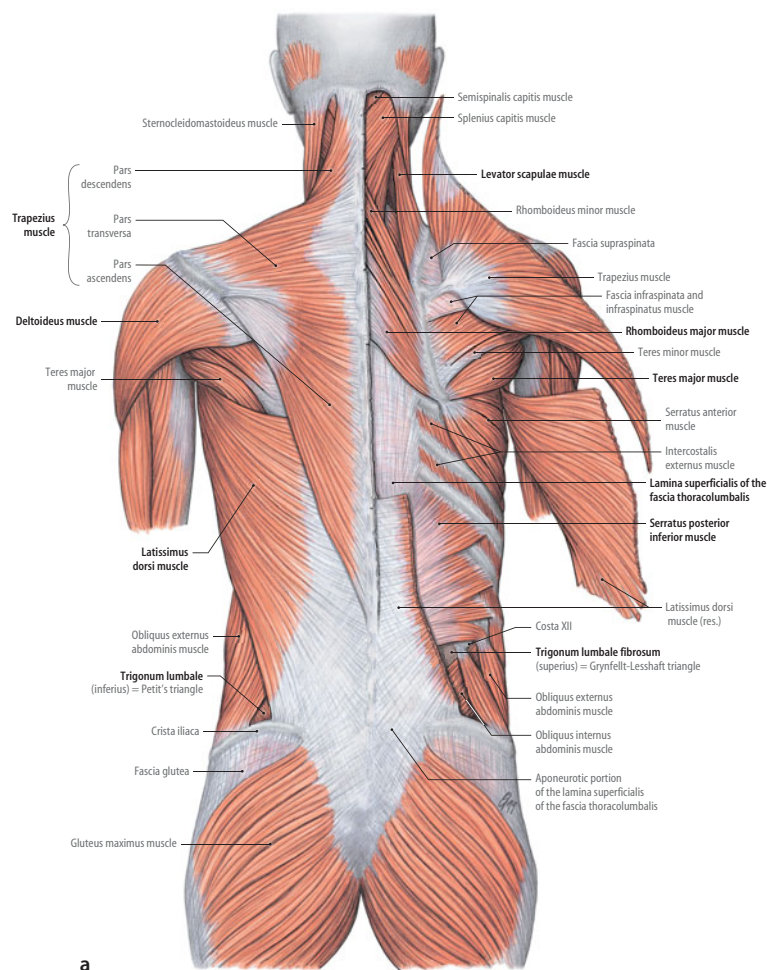


Fig. 3.50a–e Tonus-reducing application to the m. trapezius pars descendens. **a** Trapezius muscle, pars descendens. (From Tillmann 2010). **b** Measure the tape with musculature pre-stretched, from the acromion to the neck at the hairline, **c** base lies at the acromion, **d** anchor the base with skin displacement and affix the tape strip over the muscle belly to the hairline, with 0% tension, **e** completed muscle application

Tonus-Reducing Muscle Application to the M. Trapezius Pars Descendens (■ Fig. 3.50a)

Origin

Linea nuchae superior, protuberantia occipitalis externa, ligamentum nuchae

Insertion

Lateral third of the clavicle

Function

- Lateral/cranial rotation of the scapula during elevation of the arm above horizontal
- Cranial movement of the scapula
- Bilateral activation of the entire muscle: cervical extension and rotation to the contralateral side

Innervation

N. accessorius, branches of the plexus cervicalis (C2) C3–C4

■ Application

The application consists of two tape strips (right and left) and is completed on the right and left sides using the same method.

With lateral flexion to the contralateral side and flexion and rotation to the same side, the tape is measured from the center of the acromion to the hairline at the neck (■ Fig. 3.50b). In resting position, the base is affixed to the insertion at the acromion (■ Fig. 3.50c). The muscle is pre-stretched and the base anchored with skin displacement. The tape is then affixed over the muscle belly to the hairline, with 0% tension (■ Fig. 3.50d). Rub the tape while pre-stretched. Repeat the process on the opposite side. ■ Fig. 3.50e illustrates the completed tonus-reducing muscle application to the m. trapezius pars descendens, in combination with the two preceding applications.

Memo

Application: Muscle technique

Cutting technique: I-tape



Blue I-tape



Tip

Tape tension should be 0%. Any restriction to the movements of the head will tend to facilitate a headache.



Fig. 3.51 Crosstape application to the temples. **a** Crosstape application to the right temple, **b** completed bilateral application

3.11.2 Temporal Headache

The term *temporal headache* describes pain in the temporal region.

- **Goal**

A Crosstape application to the temple alleviates pain.

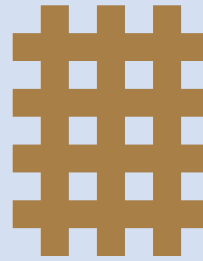
- **Application**

The exact location of the pain at the temple must first be located. Remove the Crosstape from the backing paper, holding it over the pain point at a minimal distance from the skin, and test the optimal orientation of the Crosstape, until it is drawn toward the skin. Affix the Crosstape (■ Fig. 3.51a). The application is made bilaterally (■ Fig. 3.51b).

Memo

Application: Crosstape

Cutting technique: Crosstape



Crosstape

! Tip

The Crosstape can also be cut to size if necessary. However, it is important that a cross is formed, i.e., the ends remain intact. Always cut holes from the middle, so that the ends of the lattice remain.



Fig. 3.52a–e Fascial technique for the maxillary sinus. **a** Measure the tape from nasal wing to mid-cheekbone, **b** the base lies at the nasal wing, **c** pre-stretch skin in the direction of the ear and affix the tape with 0% tension, beneath the cheekbone, **d** affix the second tape strip to the opposite side of the face using the same technique, **e** completed bilateral application

3.12 Sinusitis

Only the maxillary sinus and ethmoidal cells are already present in infants shortly after birth. The sphenoid and frontal sinuses first develop later during childhood, so that sinusitis only becomes an issue at this later stage. We can differentiate between sinusitis maxillaris and sinusitis frontalis.

3.12.1 Sinusitis Maxillaris

A dull or throbbing pain and pressure in the cheek area are typical symptoms of sinusitis maxillaris (maxillary sinusitis).

■ Goal

A fascial application to the maxillary sinus facilitates the loosening and draining of mucus secretions and aids nasal breathing.

■ Application

The application is made bilaterally. The tape length is measured from the nasal wing to the middle of the cheekbone (■ Fig. 3.52a). The tape is cut lengthwise in half or narrower. It should not reach the eye area.

The base lies at the nasal wing (■ Fig. 3.52b). Pre-stretch the skin in the direction of the ear, and affix the tape unstretched beneath the cheekbone (■ Fig. 3.52c). Repeat the application to the opposite side of the face (■ Fig. 3.52d). ■ Fig. 3.52e illustrates the completed application.

Memo

Application: Fascial technique

Cutting technique: I-tape narrow



Blue I-tape

! Tip

The tape should not be stretched when applied to the face. Pre-stretching of the facial skin is sufficient. In this way the application can be made evenly to both sides of the face.

! Tip

A Crosstape application to the location of pain in the cheek provides an effective alternative treatment.



Fig. 3.53a–d Fascial technique for the frontal sinus. **a** Measure the tape strip from over the middle of the eyebrow to the hairline, **b** the base lies above the middle of the eyebrow, **c** pre-stretch the skin toward the hairline and affix the tape with 0% tension over the forehead to the hairline, **d** completed application

3.12.2 Sinusitis Frontalis

Sinusitis frontalis first arises after 8 years of age as the frontal sinus first develops during childhood, and most frequently occurs as a consequence of an infection in the upper airway. The symptoms are pressure and pain in the area of the forehead.

■ Goal

A fascial application to the forehead facilitates the loosening and draining of mucus secretions.

■ Application

The application is made bilaterally (right and left). The tape length is measured from the eyebrow to the hairline (■ Fig. 3.53a). The tape is cut lengthwise in half or narrower. The base is placed above the middle of the eyebrow (■ Fig. 3.53b). Pre-stretch the skin in the direction of the hairline and affix the tape unstretched, moving upward (■ Fig. 3.53c). The process is repeated to the opposite side of the forehead. ■ Fig. 3.53d illustrates the completed applications for both sinusitis frontalis and maxillaris; usually only one or the other form occurs.

Memo

Application: Fascial technique

Cutting technique: I-tape narrow



Blue I-tape

! Tip

The tape should not be stretched when applied to the face. Pre-stretching of the facial skin is sufficient. In this way the application can be made evenly to both sides of the face.

! Tip

A Crosstape application to the location of pain in the forehead provides an effective alternative treatment.



Fig. 3.54a–d Ligament technique to S1 in the urogenital zone. **a** The tape strip is 1.5–2 boxes in length, depending on the size of the child, **b,c** affix the tape strips en bloc with 75% tension, over S1 in the urogenital zone, **d** completed application

3.13 Childhood Incontinence

The term *childhood incontinence* is used when a child wets the bed during the night and also experiences difficulties with urination during the day, e.g., the sudden urgent need to urinate, or excessive frequency of urination, pain, or a burning sensation when passing water. Day- and night-time incontinence affects around 15–20% of those children suffering from incontinence.

An overactive bladder is a common cause, particularly when bladder control is not fully developed. Other causes may include urinary tract infections, worms, constipation, or micturition disorders that may be partially anatomical or unconsciously acquired. Congenital neurological disorders or nerve inflammation can also lead to childhood incontinence.

■ Goal

A ligament application at S1 in the urogenital zone facilitates increased awareness and control of the bladder.

■ Application

The tape is two to 1.5–2 boxes in length (■ Fig. 3.54a), depending on the size of the child. With maximum lumbar flexion, affix the tape en bloc over S1 (■ Fig. 3.54b,c). The tape ends are attached unstretched. Rub the tape while pre-stretched. ■ Fig. 3.54d illustrates the completed application.

Memo

Application: Ligament technique

Cutting technique: I-tape



Red I-tape

! Tip

The tape can and should be effective for a longer period of time. Positive results are usually seen after the first application.

Reference

Tillmann B (2010) Atlas der Anatomie, 2. Aufl. Springer, Berlin Heidelberg

Index

A

Achilles tendon 105
atrophy 8

C

Cervical spine, asymmetrical
misalignment 59
Circulation impairments 8
Cross-Tape 6

D

Dysphagia 121

E

Edema, extracellular 29
Elbow extension deficit 91
Equinus, spastic 105

F

Foot deformities 67

G

Genu recurvatum 53

H

Hand, Palmar flexion 103
Headaches 133
High-volume insufficiency 29
Hypersalivation 123
hypertonus 7
Hypotonus 8
hypotrophy 8

K

K-Tape
– Application 10
– Colors 11
– Removal 10
K-Tape Scissors 10
K-Taping
– Contraindications 11
K-Taping Academy 6

K-Taping courses 6
K-Taping Forum 6

L

Ligament function 17
Ligamentum 16
Low-volume insufficiency 29
lumbar spine, hyperextension
43
Lymph applications 28
Lymphatic
drainage, Mechanisms of
action 31
Lymph node chain, intact 28
Lymph node chains, defective
28

M

M. abductor hallucis 69, 83
Malleoli 105
Mechanoreceptors 8
M. gastrocnemius 105
M. geniohyoideus 121
M. infraspinatus 93
M. levator scapulae 135
M. orbicularis oris 129
Mouth posture, open 131
M. popliteus 55
M. semispinalis capitis 133
M. sternocleidomastoideus 59
m. transversus abdominis 43
M. trapezius pars descendens
137
M. triceps brachii 91
Muscle activation, impaired 8
Muscle conditioning
– effect 8
– Mode of action 14
Muscle function 14
Muscle taping, s. Muscle condi-
tioning 8
myogelosis 7

N

Nociceptors 8

O

Osgood–Schlatter disease 115

P

Pain reduction 8
Pre-K Gel 10
Pre-K-Gel 5
Proprioception 8
Punctum fixum 14
Punctum mobile 14

R

Rib integration 39

S

Safety valve insufficiency 31
scalene muscles 61
Scapula alata 89
Scar Treatment 111
Shoulder, Internal rotation 93
Sinusitis 141
– frontalis 143
– maxillaris 141
Spacetape 23
– Effect 23

T

Tape, ingredients 5
Tendon function 21
Tension headache 133
tissue damage 8
Torticollis muscularis 59

U

Upper lip, shortened 129