

Appendix

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Glossary

- Active structures** Body tissue that is able to contract, such as muscles
- Active starting position** Muscle engagement prior to movement, achieved by means of attention, breathing and basic tension created through axial elongation, or dynamic tension
- Alignment** Orientation of the movement axis in the plane of motion
- Articulation of the spine** Evenly distributed segmental motion
- Axial elongation** Active reinforcement of the alignment of the spine
- C-Curve of the spine** Image describing an evenly curved spine in flexion
- Closed chain** The distal joint part of a movement is connected to a stable surface
- Compliance** Internal agreement
- Crosslinks** Disorganized healed tissue, with adhesions
- Diaphragmatic breathing** Three-dimensional activation of the diaphragm to utilize the respiratory space
- Dynamic tension** Functional co-activation of agonist and antagonist
- End position** Actively maintained body position at the end of an exercise
- Feed-forward mechanism** Pre-contraction/pre-programming mechanism, controlled by the central nervous system. The contraction of local stabilizers prior to activation of global movement muscles. Recurrent pain, lack of exercise, poor posture or surgery, can lead to inhibition of this pre-contraction and therefore of intersegmental motor control. Pre-contraction of the local stabilizers can be reactivated and relearned through targeted training, e.g., in the lumbopelvic-hip region, through specific training of the pelvic floor, M. transversus abdominis and Mm. multifidii. It is not power that counts, but timing and coordination (Hodges 1996; Hamilton 2009)
- Functional group** Functionally linked regions of the body
- Homeostasis** A state of balance, both in both healthy (physiological) and unhealthy states (pathophysiological)
- Imprint** Traditional term for an active posterior pelvic tilt, with strongly flattened lumbar spine pressed into the mat
- Movement category** Didactic classification of Pilates exercises
- Mid-position** The target body position in the movement path of an exercise
- Neutral Zone** Active stabilized movement range in a joint or spine segment. The control of the neutral zone is an interaction between muscles and structures. "The feed-forward mechanism of the local muscles restricts the neutral zone, without a loss of efficiency of movement. Cocontractions of the global muscles protect against this by rigidity but at the cost of efficiency of movement" (Hamilton 2009)
- Open chain** The distal joint part of a movement is not connected to a stable surface
- Passive structures** Noncontractile body tissue, such as tendons, ligaments, fascia, joint capsules and bones
- Pelvic floor tension** Physiological, reactive activation of the pelvic floor
- Pelvis-ribs connection** Active dynamically stabilized trunk organization (neutral, flexion, extension, lateral flexion)
- Power cylinder** Structures that contribute to the stabilization of the center of the body. Active: cylinder muscles (muscles that work together functionally, i. e., the diaphragm, transversus abdominis, the deepest parts of the multifidus, pelvic floor). Passive: spine, disc, vertebrae, ligaments
- Powerhouse** Group of synergistic trunk muscles (active)
- Progression** Increase in challenge (c.f. regression)
- Proprioception** Internal perception of joint positions and body position
- Push and Pull** Traditional term for active tension
- Regression** Simplification, decrease in challenge (c.f. progression)
- Stabilization, global** 1. Trunk stabilization, 2. eccentric deceleration, 3. phasic activity
- Stabilization, local** 1. Segmental stabilization, 2. little movement, 3. tonic activity
- Starting position** Position at the beginning of an exercise
- Stenosis** Narrowing of the intervertebral space
- Table Top Position** Supine body position, hips and knees flexed at 90°
- Tensegrity** "Tensional integrity means tensioned unit." The term was coined by designer R. Buckminster Fuller from "tension" and "integrity." "The stability of a tensegrity structure, compared to a continuous compression structure, has less stiffness and more elasticity", and is of "maximum efficiency" (Myers 2010)
- Transition** Conscious passage or link from one exercise into the next
- Transverse system** Local stabilizers that run almost transversely. Cervical spine: Obliquus Capitis. Shoulder: Serratus (according to Vleeming), Infraspinatus, Teres Minor, Subscapularis. Lumbar spine: TA, sections of the Multifidus. Hips: Piriformis, Gemelli, Obturatorii. Knee: Vastus Medialis et Lateralis at 90° flexion

Description of Anatomical Positions and Directions

(From Wottke D (2004) Die große orthopädische Rückenschule. Theorie, Praxis, Didaktik. Springer Berlin Heidelberg)

■ Axes and Planes

The following descriptions apply to the body in a standing position.

Sagittal Axis Axis that passes through the body from front to back, perpendicular to the horizon.

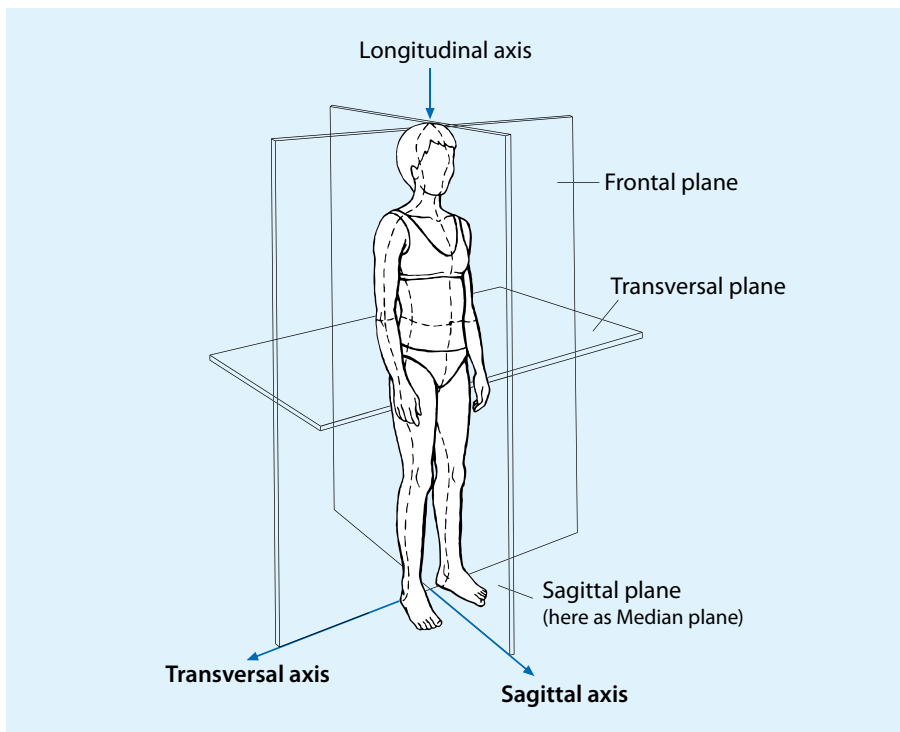
Transverse Axis Axis that passes from right to left, parallel to the horizon (Frontal axis)

Longitudinal Axis Axis that passes from the head to the feet

Sagittal Plane The plane that is vertical to the transverse axis and divides the body into left side and right side. It is formed by the longitudinal axis and the sagittal axis (mid sagittal plane = medial plane = plane of symmetry).

Frontal Plane This plane is vertical to the sagittal axis, parallel to the forehead and divides the body into front and back parts. It is formed by the longitudinal axis and transverse axis.

Transverse Plane This plane is vertical to the longitudinal axis and divides the body into upper and lower parts (horizontal plane). It is formed by the sagittal axis and transverse axis.



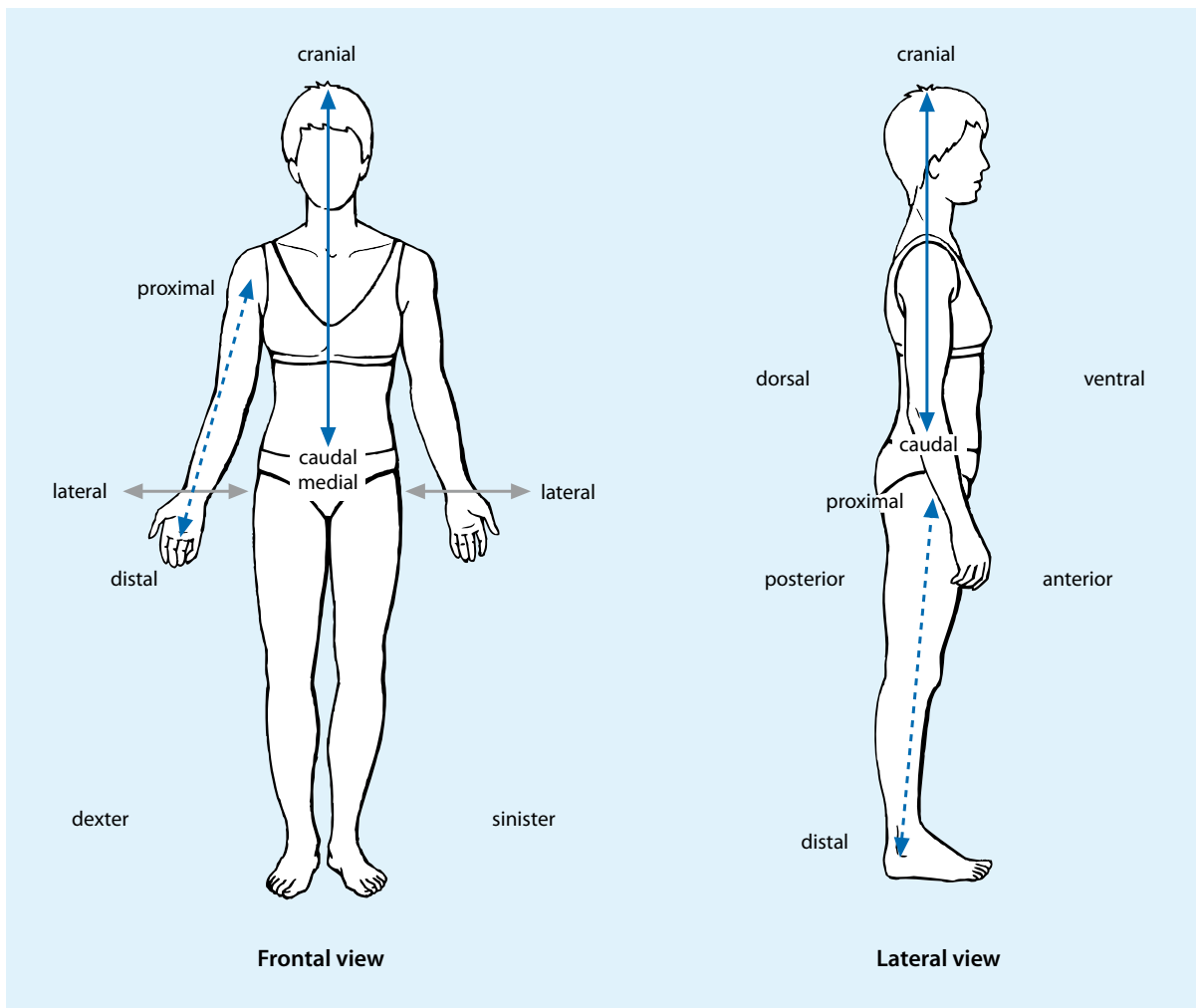
■ **Fig. A.1** Position of the anatomical axes and planes of the human body. Each plane runs along 2 axes, and is perpendicular to the third axis. Thus each axis is at a right angle to the remaining two axes

■ **Description of Positions and Directions**

Description of body positions and directions from the frontal and lateral viewpoint.

Anterior	front, to the front
Caudal	toward the feet
Central	toward the center of the body
Cranial	toward the head
Dexter	on the right side (of the patient)
Distal	distant from the center of the body
Dorsal	at the back
Externus	outside, outer, external
Inferior	below, lower
Internus	inside, inner, internal
Lateral	toward the side
Medial	toward the middle

Palmar	toward the direction of the palm
Peripheral	at the edge of the body
Plantar	toward the sole of the foot
Posterior	back, to the back
Profundus	deep
Proximal	part of the extremity that is closer to the center of the body
Radial	toward the thumb side
Sinister	on the left side (of the patient)
Superficial	shallow
Superior	above
Ulnar	toward the little finger side
Ventral	toward the front of the body
Volar	toward the direction of the palm

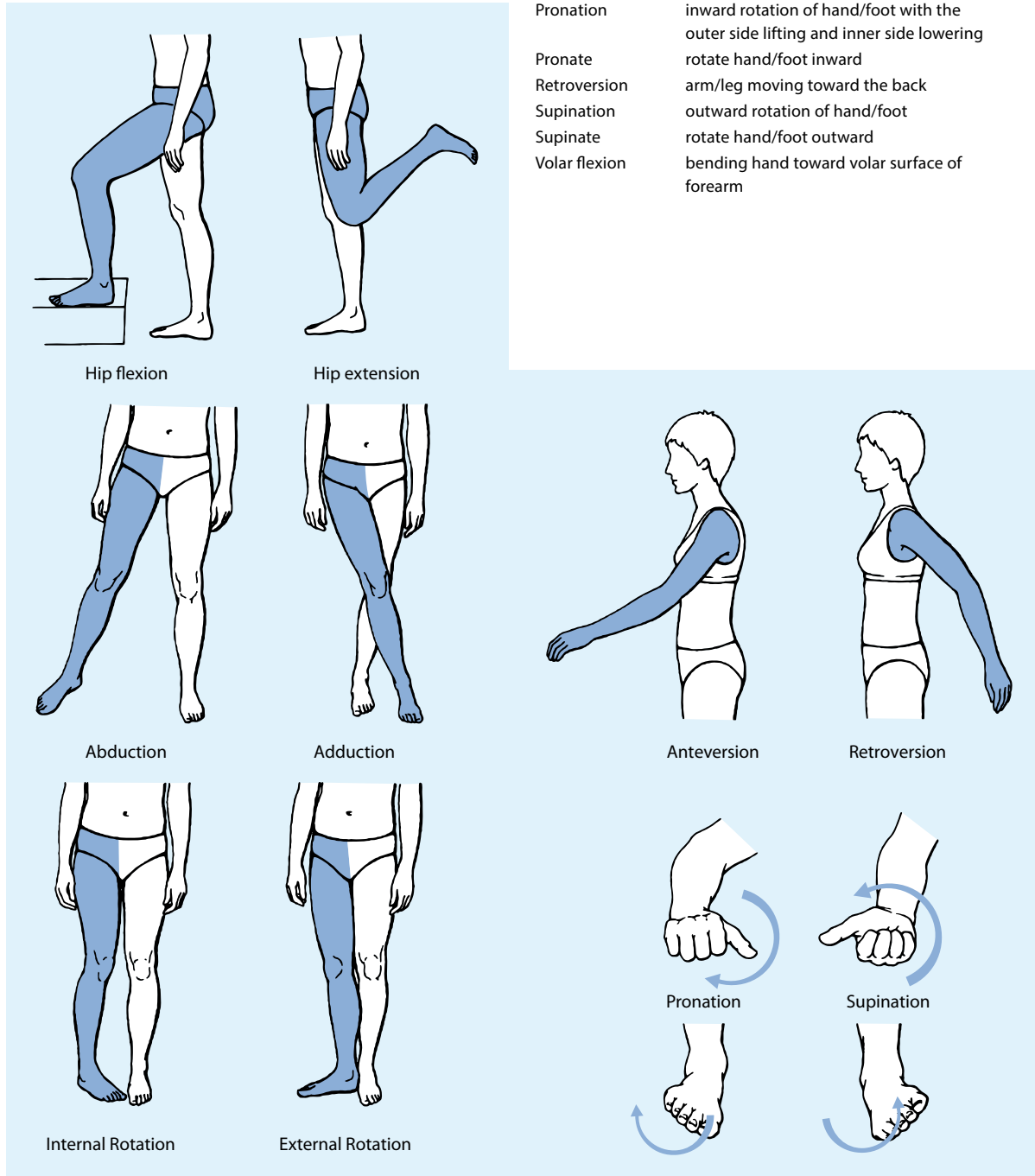


■ **Fig. A.2** Designation of body positions and directions from the frontal and lateral viewpoint

■ Directions of Movement

Abduction	arm or leg moving outward
Abduct	moving away from the midline of the body
Adduction	moving arm or leg toward the center of the body
Adduct	bring back toward the midline of the body
Anteversion	Moving arm/leg forward

Dorsiflexion	lifting foot/hand
Elevation	lifting horizontally
Extend	straighten
Extension	straightening of a joint
Flex	bend
Flexion	bending at a joint
Lateral flexion	side bending
Palmar flexion	lowering of the hand (= volar flexion)
Plantar flexion	lowering the toes
Pronation	inward rotation of hand/foot with the outer side lifting and inner side lowering
Pronate	rotate hand/foot inward
Retroversion	arm/leg moving toward the back
Supination	outward rotation of hand/foot
Supinate	rotate hand/foot outward
Volar flexion	bending hand toward volar surface of forearm



■ Fig. A.3 Movement terms for the joints of the extremities

Research Literature

Research activity

Is the Polestar Pilates™ concept an effective continuation therapy for pelvic floor dysfunction after initial physiotherapy to maintain the success of therapy?

Can isolated activation of M. transversus abdominis be more effectively triggered by Pilates training than by training with other equipment, and does this represent a link to the relief of nonspecific low back pain?

Effects of the Polestar method of Pilates training on the activity of the transversus abdominis, external oblique, internal oblique and pelvic floor muscles

Summary

The case study investigated whether women with pelvic floor dysfunction could maintain or even increase the success of previous physical therapy with 8-weeks of Polestar Pilates training.

Comparative electromyography measurements before and after Pilates training showed improved neuromuscular control of the pelvic muscles in the majority of the subjects following Pilates training.

The **results** show that Pilates was effective as a follow-up to initial physiotherapy, for the subjects of this study.

This study compared the effect of Pilates training with that of un-specified equipment training, for the relief of nonspecific low back pain.

Using before and after measurements, the isolated activation of local abdominal muscles, pain levels and functional ability were examined for both groups.

Result: The machine-training group achieved a significant improvement in everyday functioning. A correlation with the isolated activation of the transversus abdominis could not be established, however.

Comparison of neuromuscular triggering of the pelvic floor muscles and the deep abdominal muscles during the execution of Pilates exercises. One group of subjects had previously taken part in Pilates training, the other group had no experience.

Electromyographic activity of the pelvic floor muscles, lower abdominal muscles and accessory muscles were measured, firstly during Multi-activity tests and secondly during selected Pilates mat exercises.

Results: The multiactivity tests showed that Pilates trained subjects' pelvic floor muscles had a higher level of endurance. They were able to activate the muscles more strongly during mat exercises, and could perform the exercises with more control than the untrained subjects.

This suggests that long-term Pilates training can lead to increased muscular endurance of the pelvic floor muscles, improved activation of the deep abdominal muscles, and strengthening of core control.

Author

S.F. Stein, H. Wagner
(2011)

K. Auer, E. Reineck
(2010)

C. Kunkelmann
(2010)

Research activity

Pilates exercise as a therapeutic movement technique for depression – an intervention comparison with endurance training

Analysis of the effects of 8-week Pilates training on movement quality, using running as an example

Summary

Two movement therapy methods – Pilates and aerobic exercise (walking/jogging) – were analyzed for their impact on hospitalized, depressed patients. Research followed a controlled, two-group design with 60 subjects recruited, and randomly assigned to one of two intervention groups. Each subject took part in a 5-week therapeutic exercise program (3x/week 60 minutes of Pilates or walking), the design of which reflected a specific methodological approach, with a focus on the manifestation of depressive disorders. To define training parameters, subjects completed initial, continuing and concluding diagnoses as well as catamnesis. Parallel to the movement program, all subjects received identical multimodal depression therapy in a clinic. The antidepressant effect of endurance training has already been established in numerous studies. **The aim of this study** therefore was to investigate the suitability of Pilates in this field, and clarify to what extent if any, the methods differed in their effects on patients. The following parameters thus provided the focus of study during the intervention period: changes in depression, body image, competence and control conviction, coordination and submaximal endurance over the 5-week period. Changes in mood and body image were tested during the course of each therapy session. The catamnesis after 16 weeks encompassed the current level of physical activity and motivation, in addition to the level of depression. Although the evaluation of data demonstrated some significant differences in the investigated patient samples, these differences were not specific enough to be extrapolated to the reference population

Result: In summary, the Pilates method may be considered a suitable movement therapy for the treatment of depressive patients. However this study was not able to demonstrate significant differences in comparison to the endurance method.

The study analyzed whether Pilates can help runners improve their quality of movement. Female volunteers aged 20–40 years, were selected, with prior experience in running. The changing running motion of the subjects was illustrated and discussed, using a comprehensive analysis of movement before and after 8-weeks of Pilates training. The **results** of the study will be available in 1–2 months.

Author

S.M. Opitz (2011)

H. Felder (2011)

Useful Contacts and Addresses

4.1 Manufacturers

Pilates Equipment and Supplies

- Balanced Body equipment: www.sissel.de
- Gratz Pilates – Gratz Industries: www.pilates-gratz.com
- PEAK Pilates – equipment: www.peakpilates.com
- STOTT Pilates – equipment: www.stottpilates.com

Pilates Small Apparatus and Mats

- OPTP: www.optp.com
- Sissel: www.sissel.de
- Core Band: www.kathycoreypilates.com
- TOGU: www.togu.de
- YOGISTAR: www.yogistar.com
- AIREX: www.airex.de

4.2 Recognized Teacher Training Programs

■ APPI Health group

APPI Ltd Lower Ground Floor 50 – 52 Kilburn High Road London, NW6 4HJ, UK
info@appihealthgroup.com
www.appihealthgroup.com

■ BASI® Pilates

Natascha Eyber
 Maisacher Straße 100a, 82256 Fürstfeldbruck
natascha@basipilates.net
www.basipilates.de

■ Peak® Pilates

Core Pilates by Simone Hörster
 Planufer 92d, 10967 Berlin
training@corepilates.de
www.corepilates.de

■ Essence-Pilates

Kerstin Reif
 Kohlhöckerstr. 53, 28203 Bremen
studio@essence-pilates.de
www.essence-pilates.de

■ STOTT PILATES (www.merrithew.com)

Pilatesbody by Michaela Bimbi-Dresp
 Wittelsbacherstraße 16, 80469 München
Michaela.Bimbi-Dresp@t-online.de
www.pilatesbody.de

■ PILATES Bodymotion GbR

Britta Brechtefeld und Ute Weiler
 Klutstein 22, 51467 Bergisch Gladbach
info@pilates-bodymotion.de
www.pilates-bodymotion.de

■ Pilates New York

Davorka Kulenovic-Bischoff
 Ostendstraße 72, 70188 Stuttgart
info@pilates-newyork.de
www.pilates-newyork.de

■ Pilates Polestar

Krefelder Straße 18, 50670 Köln
info@pilatespolestar.de
www.pilatespolestar.de

■ Peak Pilates®

Studio Pilates Erlangen by Susan Colijn
 Lazarettstr.4, 91054 Erlangen
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■ The Pilates Standard

Juliana Afram
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■ THE BODY IN BALANCE STUDIO U.G.

Joanna Mounitfield
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www.pilatesberlin.de

■ art of motion training in movement® – Switzerland & Australia

Karin Gurtner Zentweg 17a, 3006 Bern, Switzerland
info@art-of-motion.com
www.art-of-motion.com

4.3 Professional Organizations

- **Deutscher Pilates Verband e. V. – Association of Certified Pilates Instructors**

The DPV e. V. (founded 2006) is a nonprofit, professional association of German Pilates trainers who have completed a sound training and have a commitment to regularly attend continuing training courses.

Since its foundation, the DPV has been a working partner of the German statutory health insurers. It has been instrumental in achieving the recognition of Pilates mat training for prevention courses according to § 20 SGB V, and ensuring that participation can be subsidized.

Lobbying on behalf of dedicated Pilates trainers, the Association aims to provide the German public with information and increase awareness of the value of quality education. The DPV e. V. also represents the problems and interests of its members, helping to protect them from unfair competition and providing resources and advice. Those who have completed their professional education outside the European Union may gain access by completing an independent examination set by the DPV.

Membership of the organization is a mark of quality for Pilates trainers. The health-conscious and other interested parties can find a list of certified trainers on the Association's website on the Internet.

- ■ **Contact:**

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Tel. +49-01-51-1200-3653

www.pilates-verband.de

www.pilates-forum.de

www.pilates-trainer.de

- **Pilates Method Alliance**

The Pilates Method Alliance (PMA) is an international, nonprofit, professional association and certifying body, committed to the teachings of Joseph H. and Clara Pilates. Its mission is to support the interests of the community in all its diversity and integrity, to establish certification, to continue education standards and to spread the Pilates method.

- ■ **Contact:**

Pilates Method Alliance

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www.pilatesmethodalliance.org

References and Further Reading

Research Literature

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