

For Dancers



Dance Medicine The Dancer's Workplace

An introduction for performing artists

Publishing History:

Publisher:

© Unfallkasse Berlin
www.unfallkasse-berlin.de

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Produced by:

Schwintowski | Communications, Berlin
www.schwintowski.com

Photo credits:

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With many thanks for their support:

The German Opera Berlin
The German State Opera Berlin
The Comic Opera Berlin
Joerg Reichhardt
Friedrichstadtpalast Berlin
The State Ballet School Berlin
The Palucca School Dresden – Conservatory for Dance





A word of thanks

I am truly grateful to all the dancers and former dancers, all the dance medicine specialists and dance journalists, who carefully read the rough drafts and thus contributed to the development of this brochure with their comments and suggestions.

My special thanks go to Dr. Elisabeth Exner-Grave for the concept of major portions of the chapter on "External Circumstances". I also wish to thank Dr. Eileen M. Wanke for her work on the chapters "Stamina", "Building up - Detraining", "Regeneration and Relaxation", as well as "Planning for Classes and Rehearsals".

My sincere thanks go to Mrs. Wagner-Bergelt of the Bavarian State Ballet, Munich, Mr. Jan Adamiak from Ballett-Theater, Munich, Mr. Charles Tandy, Ballet Photographer, and Mrs. Ida Zenna for the permission to use photos. A further word of gratitude goes to the members of the BallettTheater, Munich, who agreed to be photographed for this publication.

Preface

Dance and Medicine - a valuable combination

To list the number and types of injuries I have had would be inappropriate at this point. However, just as in my case, many dancers may face the problem of injuries during the course of their careers when performance demands can be extreme.

Learning to dance and working on the cutting edge as a professional dancer can be painful.

But we dancers can receive support. On the one hand, we can get help from doctors specializing in understanding the strains of dancing and dancers' injuries. On the other hand, we can practice preventive medicine by being aware of our bodies and the way they work.

My long-term contact with my doctor helped me both physically and emotionally. He helped me to trust dance medicine. Thus, I could overcome the depressive phases of injuries and always begin again to pursue my professional career with renewed motivation.

Take the contents and the goals of dance medicine seriously. They can help you build a successful career as a dancer, with a minimum of injuries and pains. I wish the dance medicine specialists continued energy and enthusiasm in their very special field, so that they can ease the lives of dancers with their new knowledge.

Gregor Seyffert

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Further information on the subject of dance medicine can be found in the following brochures:

- Schüler und Studenten
- Pädagogen
- Ärzte und Therapeuten
- Theater Directors and Ballettdirektors

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It's your health, take care of it!

Unfortunately, dancers often suffer from diseases caused by their profession and even have to give up their calling for that reason. However, it is often difficult to confirm that the resulting incapacitation has been caused by the profession.

Premiere of Les Sylphides, Ballet Russes 1909

The conditions for dancers have changed dramatically in the last 100 years. Unfortunately, with the improved technique and variety of dance styles, stress and injuries have also increased.

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In addition, even relatively minimal discomforts can seriously limit your dancing or even make it impossible. Frequently dancers try to improve their abilities and their movement quality through more intensive training. This approach often fails to bring the desired results. It can even make the disease more intense - or cause irreparable damage.

Already in the middle of the 18th century, the French ballet reformer, Jean Georges Noverre wrote in his book, *Letters on the Art of Dancing and on Ballet*, about the dance profession causing strain on the body. Yet it was only since the beginning of the 1980s that scientific studies in Europe and in USA began to systematically examine the diseases of dancers. As a result, we have recommendations for prevention, methods of treatment, and rehabilitation techniques. Many diseases can be avoided or lessened either through prophylactic measures or, if diagnosed soon enough, skilled treatment.

With sufficient knowledge about the influencing factors (demands and strains) and their effects on the health and ability to perform, a dancer can prevent injuries and respond correctly to diseases. Another necessary element is looking for appropriate help. For this, we need the cooperation of doctors, therapists, psychologists, and dieticians who are specialized in dance medicine.

Strains

Physical strains
Mental and psychological factors
Flooring
Temperature
Lighting
Dangerous materials
Working strains
Work with partners
Unusual choreographies

Demands

Muscular and skeletal systems
Sensory organs
Nervous system
Skin
Psyche
Heart and circulatory system
Breathing apparatus

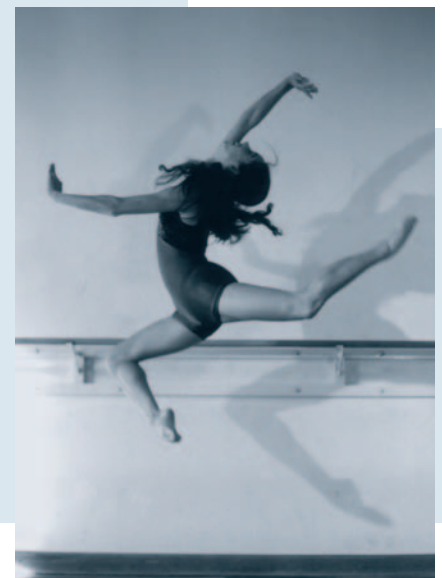
What can influence the ability to perform:

- *State of health;*
- *Physical condition;*
- *Training and experience;*
- *Motivation;*
- *Age and gender;*
- *Facility and disposition;*
- *Phases of relaxation and regeneration;*
- *Working conditions.*

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Various strains affect every dancer during schooling and professional work. Several organs and systems are placed under particular strain. Whether or not they will be excessively strained depends to a large extent upon a dancer's personal abilities. And these can be influenced.

This booklet is intended to help you to know your body better, and to recognize your own limitations. If you pay attention to what you learn here, you will be able to enjoy your career as a dancer for a longer time with fewer limitations.



Extreme physical performance

Physical Prerequisites



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In order to execute the technique of dancing cleanly, correctly, and in a healthy manner, dancers must have certain physical prerequisites. Some of these can be developed through intensive, solidly based early training. Others depend upon the genetic potential of the dancer which cannot be influenced.

In this brochure we will deal with those areas which are essential for the most frequent styles of stage dance (classical ballet, modern, and jazz). For these, the primary concern is the movement apparatus. The bones, muscles, tendons and ligaments are what either restrict motion or make dance movements possible.



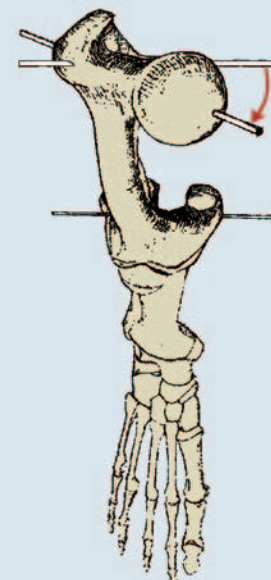
The Hip - the "en dehors"

Dancers need an extreme amount of mobility in the hip joint. Whether for high extension or for a good "en dehors", the flexibility of this joint must be far beyond the normal range of movement. The "en dehors" - the turn-out of the legs - is found in almost all styles of dance. In classical ballet, you need sufficient turn-out to be able to carry out movements cleanly.

The external rotation of the legs is determined by both the turn-out in the hips and the rotation of the calf. The second of these is located in the bone itself. It is genetically determined and varies from one individual to another. It is not possible to change it through working. As opposed to that, the turn-out in the hip depends upon several factors:

- The **bone structure** determines the maximal limits of mobility. The position and depth of the hip socket, as well as the position of the head of the femur are decisive factors. The antitorsion angle (the angle in the horizontal plane between the neck of the thigh bone and the body of this bone) is a decisive factor for the extent of the turn-out. On the average, this angle is 13° . The smaller this angle, the more natural turn-out is in the hip joint.
- Numerous **ligaments** not only stabilize and protect the hip joint but also limit its mobility. The strongest ligament in the body, the so-called Y-ligament, is located on the front of the hip joint. A part of this ligament is under tension during external rotation and thus limits the "en dehors". By beginning with classes at an early age, one can gain elasticity in this ligament. Thus, the "en dehors" can easily be improved. By the end of puberty, however, the Y-ligament can only be stretched to a small extent. Then you can not expect to lengthen it permanently.
- Many **muscles** are involved in the movements of the hip. What can aid a dancer is the correct usage of the external rotators while relaxing the opposing muscles, which perform the internal rotation. In this way a dancer can train the "en dehors" to achieve the limits set by the bone structure. After puberty, this is the most important mechanism for improving the turn-out.

What determines the turn-out

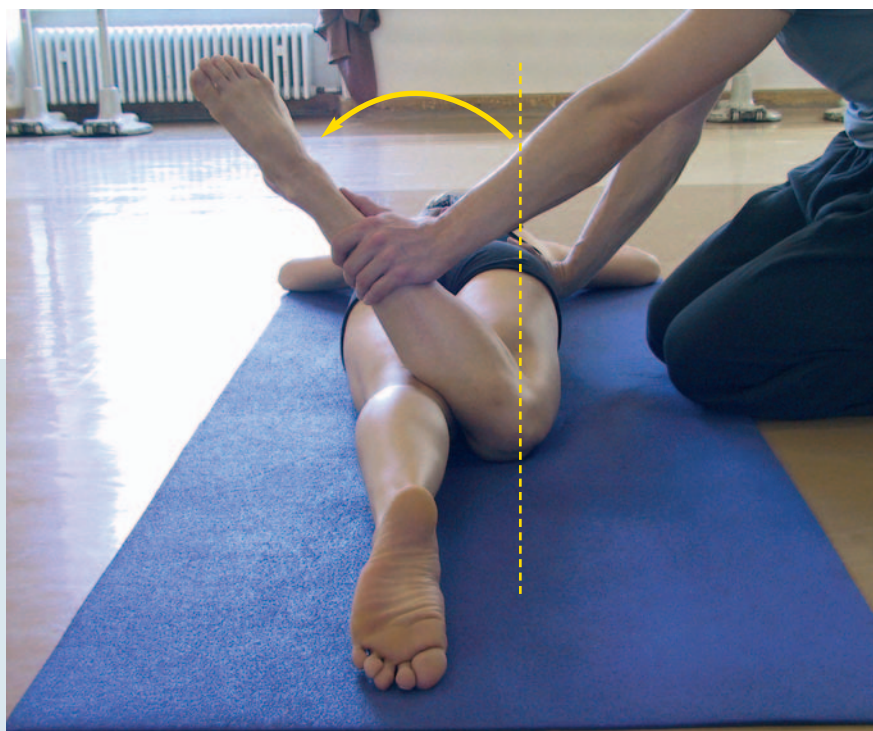


The Antitorsion angle in the Hip

How to judge the "en dehors"

The bone structure is the basis for the turn-out in the hip. Only a doctor can determine precisely the extent of this "en dehors" angle. But for an approximation in the ballet studio, you can measure it as follows:

The dancer lies on the stomach and stretches both legs. The knees are parallel. On the side to be tested, the knee is bent to ninety degrees, the calf serves as a measuring device. Now someone else presses the calf inward towards the floor - this corresponds to external rotation in the hip. While testing, the pelvis on the side being measured may not be lifted off the floor and you must not rotate the knee. The angle between the calf and the vertical axis shows the turn-out in the hip.



Measurement of the external rotation in the hip

Sixty degrees or more external rotation in the hip is an amount which is suitable for classical dance.

Knees - hyperextended legs

Knees capable of being stretched beyond the straight line are referred to in dance as being hyperextended. This form of leg is hereditary. Often they indicate a general hypermobility. This is often one of the typical criteria for being selected for classical dance. A knee that can be stretched beyond the straight line gives the desired esthetic line.

This must be differentiated from other common malformations of the legs: knocked-knees and bowed legs. In these, the knee varies to the side from the straight line if one is standing in a parallel position. For the desired line in ballet, the legs should be straight when viewed from the front in this position. Hyperextension is only visible from the side.

An ideal compromise between a stable axis of the leg and an esthetic line is a slight hyperflexibility of ten degrees in the standing leg. "En l'air" you can use the full hyperextension in the working leg, here there is no problem with a classical axis in the leg.

Hyperextended legs can pose problems

The more hyperextended the legs,

- *The more mobility is necessary in the feet*
- *The higher the risk of a swayed back*
- *The less stability is in the axis of the leg*
- *The higher the risk of injury to the knee*

A hyperextension of 15 degrees or more in the standing leg can lead to instability and overworking the knee. Not only do the menisci and cruciate ligaments take too much strain, but also do the muscles and the tendons on the back side of the knee. The balance of forces of the muscles that stabilize the knee is lost. In this case, the dancers often "hang" in their knees. The muscles do not get enough work and the excessive strain is increased.

Thus, the classical positions can not be cleanly executed. The first and fifth positions can only be done with bent knees. Stability and ability to balance are lost. Extremely hyperextended legs often lead to placing the weight further back. The heels take the main weight of the body. Numerous overwork strains in the whole leg come from this.

Don't hang passively into your hyperextension! It is necessary to develop a new sensitivity for the line of the leg. If you have more than 15 degrees of hyperextension, you must work against it during your class.

While standing, aim for a straight line in the legs. All the muscles around the knee should be engaged in stabilizing the leg. You should not pull the kneecaps up while stretching the legs! Only in this manner will the muscles in front and in back work in balance with each other. Often the dancer has the feeling of not being able to stretch the knee correctly. It is necessary to develop a new sensitivity for the axis of the legs.

What can happen

What you can do



Flexibility of a dancer's foot

Feet - the arch

An elegant line of the foot is highly prized in various styles of dance. As the extension of the esthetic line of the leg, it is especially crucial in classical ballet that the foot has a maximum of mobility in all of its joints to achieve the classical arch.

Only with maximum flexibility can the heads of the metatarsals, the talus, and the bones of the calf be in one line in "relevé" and on full pointe, and have the best relation to gravity. In this way, the strain of the body weight is applied to the axis of the foot bones. This insures the best biomechanical stability. Hence, the ideal foot for dancers is not only esthetic, but also is important for preventive medicine.

As opposed to that, the form of foot with a very high arch, often preferred in dance for esthetic reasons, is not so suitable for dance because of its lack of stability and its tendency to lose mobility early on. In this case, you must make sure you have sufficient strength in the small muscles of the foot and maintain mobility in the metatarsal and ankle joints.

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What determines the Arch

In order to carry out the technique of dance correctly, a lot of mobility is necessary in the following joints:

- **The upper ankle joint:**
needs at least 70 degrees of active stretching (in the Pointe position);
- **The tarsal joints:**
need 15 to 20 degrees in active stretching;
- **The bunion joint:**
needs a passive stretch of 80 degrees when flexed (when the big toe is pulled up).

Mobility and form of the foot are mostly genetically determined. But they can be improved through early and correct training. Working for increased mobility should never be done without additional stability training because only a foot that is both flexible and strong can be prepared for the demands of dancing.

- The mobility of the **upper ankle joint** can only be increased a small amount through coordination training.
- The mobility in the **tarsal joints** can be improved through appropriate mobilizations, whether on your own or through someone else's assistance (attention: the intensively advertised Foot-Stretch-Machines are not suitable for this!).
- The flexibility of the **bunion joint** of the big toe is determined by the bony structures and can not easily be improved through training.

How to judge the Arch

The test of mobility in the foot should be differentiated into individual joints (as mentioned above). There should also be a differentiation between passive and active mobility.

The active test is done while standing on "relevé" or "on pointe". The foot should be able to be stabilized in a straight line with the shin. Pay attention to deviations to the sides. The foot should neither sickle out or in.

The Vertebral Column - flexibility

Dancers need good mobility of the entire vertebral column as a basis for numerous movements. This may be obvious for "arabesque" or "cambré". But with a stiff back it is also not possible to perfect "grand battements" or big jumps. Every movement of the pelvis extends to the vertebral column. One usually compensates for these movements in the lumbar vertebrae. Therefore, under special strain, sufficient flexibility and stability of the whole vertebral column are particularly important.

The following prerequisites are important for a healthy dancer's back:

- A balanced distribution of the movements in the vertebral column;
- A normal curvature of the lumbar spine;
- Balanced positioning of the pelvis (no forced swayed back in the turned out position);
- Good mobility in all the sections of the vertebral column;
- Stability in the small muscles of the back;
- Strength in the deep muscles of the abdomen.



Extreme mobility of the back

The small joints between the vertebrae determine the directions of movement that are possible in the different sections of the column. This can not be changed through working. However, the extent of mobility of the individual sections can be improved through specific exercises.

What determines Mobility



It is important to have a balanced amount of mobility in all of the vertebral column. You can best judge this in a standing position.

- In bending to the side the whole vertebral column should make a harmonious curve. This movement should include all the segments of the back.
- In bending to the back the movement should also be well distributed among the different sections. Look for a potentially increased movement in the lumbar vertebrae. In the long run, this can lead to overstraining this area.

How to judge Mobility

As long as you have harmonious mobility in the vertebral column you can still dance even you have a mild scoliosis (a sideways curve of the column). In the case of a strong scoliosis, a doctor with experience in dance medicine should be consulted.

Flexibility versus Hypermobility

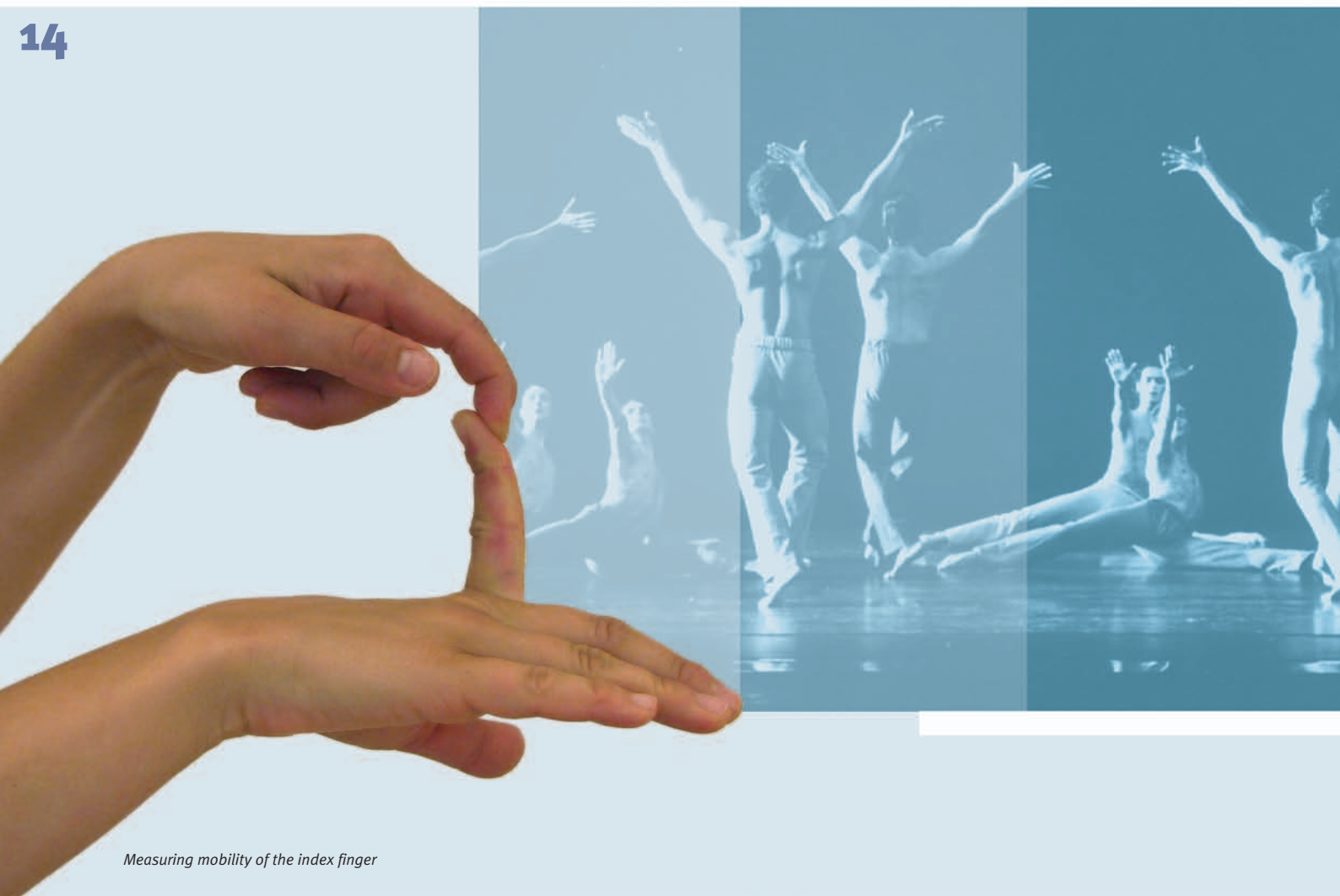
Dance demands exceptional mobility in various joints of the body. Basically it depends upon the following

- The bony structures of the joints;
- The flexibility of ligaments, tendons and the capsule of the joints;
- The flexibility of the muscles.

General flexibility is defined as that amount of mobility which is natural to your constitution. This is inborn, but can be increased, to some extent, through work.

Specific flexibility is the flexibility in certain joints. In dance, you need above average mobility in the vertebral column, the hips, and the feet.

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Measuring mobility of the index finger



One speaks of **hypermobility** if someone has more than a normal amount of mobility, either generally or in specific joints. If you are too flexible in certain joints, they are exposed to an increased strain and thus are susceptible to premature wear and tear.

The absence of mobility in the vertebral column, hips, and feet makes it difficult to execute technique cleanly, and therefore leads to injury and **premature wear and tear**.

What can happen

Hypermobility can lead to general and specific **instability**. It is difficult to control the middle of the body, and becomes more difficult to hold a balance. Local hypermobility is often the result of decreased mobility in neighboring joints.

Uncontrolled movements can lead to **injuries** in the hypermobile joints.

As we get older, our general mobility decreases. Regular stretching helps to slow down this process (see the chapter "Warm Up - Cool Down", starting on page 51).

What you can do

Dancers should be flexible, but not hypermobile. If you have a general or local hypermobility, then you should not stretch even more in this area. Don't train for excessive mobility! In this case it is much more important to stabilize than to force more flexibility.

Coordination helps in achieving stability and balance. Training the coordination improves the way the muscles work and at the same time increases the range of motion.



Physical Strain



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Dance is high level "sport", from the point of view of the physical strain. Unfortunately, this also applies as far as injuries are concerned. On the average, dancers work in their profession from ten to fifteen years. In addition, there are six to eight years of training: a long period of high performance. Physical discomforts and pains are often a part of everyday life. Only a third of these discomforts lead to an interruption of training. The rest are tolerated or ignored. Dance and pain often seem to be synonymous.

Frequently, dancers have to give up professional dancing because of injuries. Relatively seldom is this caused by acute injuries. The chronic injuries, excessive strains which have many causes, are the more prominent reasons for early retirement. Among these one must include: exhaustion, nervousness, performance stress, poor stamina, inadequate nutrition, and/or technical mistakes. Poor training and an inadequate planning of rehearsals and choreography can also lead to an incongruity between your burden and how much your body can take. Added to that are insufficient phases of regeneration and relaxation. Thus, chronic illnesses are often the logical result.

What you should know about your Physical Strain



Practicing dance medicine in the ballet studio

Regularly taking anti-inflammatory medicines to counteract the pains and to improve performance is surely not an appropriate answer. When using such medicines, the "controlling mechanism" of pain is artificially shut off and the strain which is causing the damage to the body is forced beyond appropriate limits. The injured tissues can not sufficiently recover and can be damaged permanently. In addition, through long-term use of anti-inflammatory medicines, numerous uncomfortable side-effects can appear. These include: nausea, stomach ulcers, circulatory problems or dizziness, and these again may increase the risk of injury!

For each dance medicine rehabilitation, after sufficient rest and therapy, it is necessary to have a precise analysis of the causes. Only in this way can you prevent a reappearance of the injury and its chronic course. It is of primary importance to make a detailed examination of the dance technique and the external circumstances.

Most injuries affect the feet, knees, hips and the lower back. The more acrobatic the dancing is, the more injuries occur to the upper back, shoulders and arms.

What you can do

Regular check-ups with a doctor or therapist who is trained in dance medicine can help to test the dance technique and the body. Thus, excessive strain can be recognized early and injuries may be avoided. It makes good sense to do follow-up examinations every six to twelve months.

Take your pains seriously! Look for doctors and therapists whom you can see regularly and whom you can trust to know about specific dance health issues.

You can cause problems through the regular use of anti-inflammatory medication. Even if you only take such pills for a short time, be aware that you are cutting off the important "control mechanism of pain".

Injuries can have numerous causes. Check all of the possibilities you know. Try to get a clear picture of the whole situation. The causes of the injury can only really be eliminated in this way.

Together with your doctor and/or therapist, try to find out what are the connections between injuries and dance technique. Integrate the necessary changes into your daily routine of class and rehearsals. Do not allow yourself to be put under pressure by your teachers, choreographers, or ballet director. In this situation, look for an open discussion. If necessary, work with your doctor/therapist in order to find solutions and to eliminate the causes. This is the basis of prevention and rehabilitation of your dance injuries.

Make sure you allow your injuries to heal completely! If you begin to increase the load too soon after an injury, then it can reappear and become chronic. If you favor the weaker side and do movements to compensate, whether consciously or unconsciously, you also increase the danger of injury.

The following is a discussion of the most frequent dance injuries with a description of their causes. The recommendations at the end of each chapter should help you to react promptly to your discomforts and to avoid more serious injuries.

Feet

There is no other type of "sport" which puts as much strain on the foot as dance does. Half of all the days missed in dance are because of foot injuries. Among the numerous causes of foot injuries we find: the need for maximum flexibility even in the smallest articulation of the foot, lack of stabilization and protection through shoes and often hard, unsuitable floors. Repeated chronic discomforts in the feet accompany many dancers throughout their entire schooling and careers. In this case, a strong and muscularly well stabilized foot is the best prevention and therapy.



Maximal flexibility of the foot

Twisted ankles (supination trauma):

Twisting the ankle is the most frequent dance injury. The foot can tip towards the outside during a landing from a jump or even when you lose your balance on "relevé" or on "pointe". If the muscles can not respond quickly enough, the capsule and external ligaments of the upper ankle joint can be stretched or torn. According to how it happens, one or more ligaments can be affected. Recovery time depends upon both the manner and the extent of the injury.

Fractured fifth metatarsal: This injury can also result from a twisted ankle. Dancers frequently get spiral fractures in this bone. Therefore this injury is also referred to as a "dancers fracture".

Acute injuries

Broken toes: A relatively frequent injury. It can occur while dancing in bare feet through direct hits or if the fifth toe gets caught on something.

Cuboid subluxation: This blockage in the back of the foot occurs through a displacement of one of the bones, the cuboid. The acute or chronic limitation of movement leads to pains on the outer edge of the foot, weakness for the jump and a limitation of the ability to stretch the foot.

Torn Achilles tendon: This seldom occurs in younger dancers. Instead, it is more typical in older male dancers. It is not unusual for the acute injury to be preceded by a chronic inflammation of the tendon. What has shown to be long term strains for these tendons are: hard muscles, insufficient "warm-up" and "cool-down", as well as rehearsals and performances on unsuitable floors.

Chronic Injuries

Chronic injuries are best subdivided according to the areas of the foot where they occur.

1. The Forefoot

Dancers repeatedly stand on half-pointe during class. The forefoot acts as an important shock absorber for every jump. It should not come as a surprise that this part of the foot is especially often a problem zone for dancers!

Bunions (hallux valgus): This refers to the big toe which points towards the little toe. It is often associated with an increase in size of the ball of the foot. Usually this also involves a loss of the transverse arch of the foot, which is called a splayed foot. Up to ninety percent of all dancers suffer from a splayed foot. The tendency to get a hallux valgus is usually inherited. But dance promotes the development of a splayed foot, and this increases the probability of getting a bunion. Other contributing factors are weak foot muscles, rolling in, and starting to dance on pointe too early. Often a bunion only causes a visual disturbance. But if the malformation gets bigger, then both dance shoes and street shoes press against the base joint of the big toe. The ball of the foot gets inflamed, typically a bursitis develops. In advanced stages, the hallux valgus leads to an alteration of the static in the foot. Arthritis, with restricted mobility in the base joint of the big toe is the result.



Hallux valgus

Arthritis in the base joint of the big toe: This can develop if you repeatedly force the toe to move beyond its natural range of movement. Dancers who do not naturally have the necessary

80 degrees of mobility in this joint are most often affected. They can only achieve a high relevé by putting an extreme strain on this joint.

Sesamoiditis: This is the inflammation of the small sesamoid bone directly under the base joint of the big toe. Every relevé places a large part of the body weight on this small bone. Weak foot muscles, the loss of the transverse arch, poor distribution of weight during the demi-pointe, or rolling in can lead to a higher strain on this area. Jumping on a hard floor or rehearsing on high heels can also cause inflammations.

Blisters and corns: These are a matter of course for many dancers. They appear on places where there is a lot of pressure and friction. They cause problems when they become inflamed, which can easily happen after opening them with unsterilized sharp instruments.

2. The mid-foot

Stress fractures: These are most likely to occur in the second and third metatarsal bones. The bone can not withstand the continual strain placed upon it. Cracks develop in the bone itself. Aside from too much strain, special causes are weakness of the foot musculature and individual metatarsal bones that are too long. Because of these longer bones, the weight can not be properly distributed in "relevé". But hard floors and "thin" bones from inadequate diet can also be causes of stress fractures. The pain usually begins gradually and becomes more intense with time. It is often difficult to make this diagnosis, the therapy takes a long time.

3. The ankle joint

Inflamed tendon sheaths: A typical dancer problem is the inflammation of the tendon sheath of the long muscle which bends the big toe (*M. flexor hallucis longus*). Through gripping with the big toe or through overly straining the inside of the foot by rolling in, the tendons and tendon sheath of the muscle gets irritated and inflamed. The pains on the inner side of the ankle are often misinterpreted as Achilles tendon pains.

Impingement: This term refers to a squeezing of bone or other tissue at the end of a movement. In the ankle there are impingements in the front and in the back sides. While forcing the foot to stretch, on pointe or half-pointe, you can have a stabbing pain in the back of the ankle. The cause of this impingement is often an additional little bone or an enlarged bursa. Both can be squeezed between the talus and the calf bone during a maximal stretch of the foot. Repeated impingement leads to local irritation and inflammation. We refer to a ventral impingement if, during a plié, the bones in the front hit together and thus cause a limitation of movement.

Achilles tendon irritation: A frequent result of overwork. It can be caused by jumping on a hard floor, not putting the heels down during the landing, cramped calf muscles, rolling in and also mechanical friction from ribbons or shoe edges. The tendon tissue gets inflamed, turns red, swells and is painful during weight bearing.

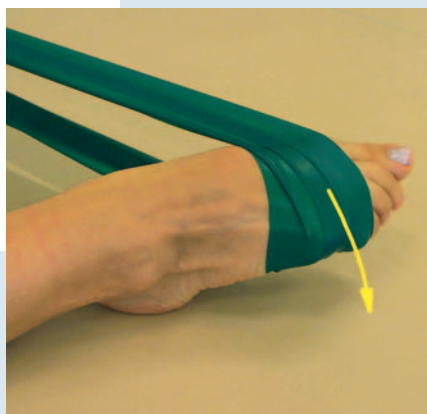
4. The Calf

Shin splints: A complex disturbance is concealed behind this term. The main symptoms are pains on the front and inner side of the shin. The diagnosis can involve muscular tenseness, irritations to the periosteum (the covering of the bones), periostitis, or even a stress fracture. The causes are to be found in the dance technique, for example, in placing the weight too far back, over-stretching the knees, or heels which are not put on the floor during a landing. But further causes for shin splints can be insufficient warm-up and cool-down, muscular imbalances, or unsuitable floors.

What you can do

There are many causes for injuries in the foot area. Not all of them are able to be altered by the dancer. Yet through appropriate training and observing several protective measures many of them can be avoided.

- Strong feet are the best prevention! Make sure you get enough exercise for the small muscles of the foot. Also the outer muscles of the calf (Mm. peronei) should get extra work. During the normal dance class, none of these muscles are worked enough, and definitely do not get built up. Yet they are of great importance for the general stability.
- Mobilize your feet before classes and rehearsals. A few minutes can be enough to raise the sensitivity of the whole foot. Soft balls with points on them are a special help for this. Just stand on them with one foot and mobilize the smaller foot joints through your own weight. But pay attention: it is not the ankle joint, but the metatarsal joints which should be mobilized.
- Do not take class in shoes that are too tight. The foot expands when bearing weight. Do not try to improve the look of the arch by putting it into shoes that are too narrow. The edge of the shoes, the ribbons and elastics should also not be too tight. The foot needs sufficient circulation if it is to work well. Frequent muscle cramps in the sole of the foot can be a sign of circulatory disturbances.
- Change your brand of shoes now and then. In the realm of dance shoes, there are often interesting and helpful new ideas. An elastic heel on the point shoes, for example, can take the pressure off the heel and is especially useful against chronic irritations of the Achilles tendon. Slippers with elastics worked into the sole of the shoe not only improve the optical impression of the foot but also stimulate the small muscles of the foot to work.
- Now and then do your class without shoes. Working in socks can improve the small muscles of the foot. But be careful in the center during turns and jumps! Frequent work in old point shoes as a replacement for slippers weakens the small foot muscles.
- Give your feet a rest. A foot bath after the performance can relax more than just the feet. Massage your painful points. Give special attention to the inside, the sole of the foot and the insertion of the Achilles into the heel bone.



Strengthening the outer muscles of the foot:
pushing the foot to the outside against a resistance

Test your dance technique for the following:

- Am I forcing the "en dehors" from the feet?
- Do I often stand on the inner or outer edge of the foot?
- Do I put pressure on the big toe during a tendu?
- Do I grip with the toes?
- Can I relax my toes in a relevé?
- Do I put my heels down on the landings from jumps?

- Treat blisters and corns carefully. Do not use sharp instruments to open them! Use a thoroughly sterilized needle to open the blister on two points to let out the fluid and reduce the painful pressure, but keep the layer of skin to prevent infection. Cover them with a bandage if they will be exposed to pressure or friction. For this you can find a special blister bandage in any drugstore with hydrocolloid wound covering (second skin) which can be a big help. The rest of the time you should let as much air as possible onto the blister.
- If you have a tendency toward getting bunions, you should be sure to do special exercises for the little muscles of the foot. In this manner, you can work against getting a splayed foot and bring the big toe back into its position. Taping the transverse arch in the front of the foot and using a so-called sixth toe between the big toe and the second toe are good ideas. But they are still no replacement for strengthening the muscles and regularly mobilizing the joint at the base of the big toe.
- Take your time when buying shoes. Not only the dance shoes should be well fitted. After a long day of rehearsals you should not strain your feet more with poorly fitted street shoes.

Knees

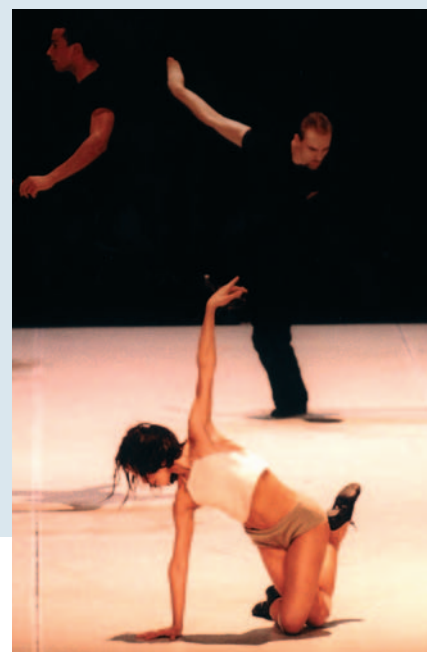
In dance, aside from the foot, the knee is one of the most frequently injured areas of the body. Knee pains are often a result of acute or continual incorrect weight bearing, often depending upon an inappropriate static in the whole leg. Causes of knee pains are deficiencies in the dance technique, compensations as a result of hip or foot pains, hard floors and/or unaccustomed shoes. The knee just shows the effects.

With the increase of contemporary dance and acrobatic elements in stage dancing, the incidence of acute knee injuries is also increasing.

Rupture of the anterior cruciate ligament: This traumatic injury can mean the end of a dance career. Acute traumas upon landing from a jump or dynamic floor work can be causes, as can uneven floors, impaired vision, lack of space, or collisions with other dancers or performers. Through a traumatic twisting of the calf with a bent knee, the anterior cruciate ligament is put under intense pressure and finally rips.

Torn meniscus: This is often combined with the rupture of the anterior cruciate ligament. But isolated injuries in the meniscus are also possible. The posterior section of the medial meniscus is most frequently affected, since the most biomechanical pressure is applied here. By trying to force the turn-out from the knee, often in combination with rolling in of the feet, this strain is intensified.

Acute Injuries



Strain on the knees

Patella luxation: During a landing or a turn on an unstable leg, the kneecap can jump out of the position where it belongs. When the turn-out is forced from the knee, the kneecap can be pulled to the side and can jump out of its natural position.

Bursitis: A bursitis can develop, especially during dynamic work on the floor with repeated traumas underneath or directly on the kneecap. Direct mechanical pressure, bruising or friction can cause bleeding in the bursa and thus lead to acute swelling, redness, and inflammation.

Chronic injuries

Meniscus degeneration: This occurs relatively often. Similar to the acute tears of the meniscus, it is especially the posterior horn of the inner meniscus which is most often affected. The extreme strain and compression on this area leads to gradual changes in the cartilage structure and reduces the stability of the meniscus.

Chondropathia patellae: This term refers to all pains behind the kneecap. Often, these pains are associated with an asymmetrical form of the patella and a slanted axis of movement in the channel where it should slide. The resulting unbalanced strain on the cartilage of the kneecap leads to irritations, to a swelling of the cartilage and to wear and tear. The results can be pains after sitting a long time, at the beginning of weight bearing and after long periods of work. If the thigh muscles are too tense, this can cause pressure on the patella and lead to worse discomfort.

Inflammations of the insertions of the ligaments: These can develop especially near the kneecap. The jumper's knee is an inflammation on the point where the patellar ligament attaches to the lower tip of the patella. The causes can be extremely hyper-extended knees, forcing the rotation from the knees if the "en dehors" of the hip is insufficient, jumping on a hard floor, an intensive increase in the work or not warming up enough. A temporary reduction of the work load is necessary.

What you can do

- Warm up your knees before the class and rehearsals. For that, it is best to move the knee without weight on it. Ideal for warming up the knees are both bicycling (for example to the theater) and bicycling movements while lying on the back. But also pay attention to the legs' axes: the knees and the tips of the toes should remain parallel, pointing forward and stay in this axis while in movement.
- Do not try to get turn-out from the knees! The external rotation must always be held by the hip rotators, so that no unnecessary rotation in the knee joints can happen under strain. The knee should always point over the second toe during the plié.
- "Rolling in" increases the strain on the inner side of the knee. Pay attention and distribute your weight evenly over the whole foot to avoid overstraining the knee on one side.

- "Grand plié" should only be done when the muscles are sufficiently warmed up! If the muscles are still cold and inflexible, then the kneecap will be pressed against the thigh bone with full force. This irritates the cartilage. It swells and causes pain. "Grand plié" in the fourth position should only be done with good muscular control and only when the knees are healthy!
- Be aware of the axes of your legs! Overly stretched knees may be the ideal for classical ballet, but if the muscular control is not sufficient this can lead to premature degeneration. The standing leg should always be stretched but not hyperextended!
- Stretch and relax all of the thigh muscles after class and rehearsals. When you have pains in this area you should pay special attention to relaxing the front of the thigh, so as to reduce pressure on the kneecap.
- Wear kneepads if you have rehearsals with a lot of contact between your knees and the floor.
- Avoid wearing high heels on a daily basis. High heels put a strain on the knees. They lead to excessive strain and pains, especially in the front of the knee.

Check your dance technique for the following:

- *Am I forcing the "en dehors" from the knees?*
- *Am I rolling onto the inside of the foot?*
- *Am I hyperextending my standing leg?*
- *Am I pulling the kneecap up as much as possible while stretching the leg?*

Hips



Extreme mobility in the hips

In dance, we often refer to the whole groin area as the hip. The hip joint itself is a well protected and stabile joint. Pains in the hip region are seldom really in the joint itself. Usually dancers have discomforts in the ligaments, tendons and muscles.

Acute injuries to the hip are quite rare; however chronic pains can be common. They become more intense if you continue working without therapy and finally they lead to acute pains.

Acute injuries



Chronic injuries

Groin pains: They are quite frequent among dancers. The cause is often too much work for the muscles which bend the hip, lifting the knee en avant. Irritations and inflammations can develop in the tendons. If the discomfort lasts longer, a bursa can also be affected.



Clicking hip: One possible cause of this can be the development of suction within the joint capsule during big movements of the hip. Then a loud noise can occur within the joint while you lower the leg. Noises in the groin while doing an "à la seconde" usually come from over-tensed muscles that bend the hip (M. iliopsoas). The tendon of this muscle jumps over the anterior part of the hip joint and causes a loud clicking. Snapping on the outside of the thigh indicates a shortening of the external tendinous plate (tractus iliotibialis, or "IT-band"). Here again, the tightened tendon jumps over a bony ridge and leads to an often uncomfortable noise.

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Extreme stretching of the hip joint

Piriformis syndrome: This expresses itself through pains which radiate into the back of the thigh. Because of tension and thickening of the small butt muscles, which are especially important for the external rotation of the hip, irritations of the sciatic nerve can result.

Arthritis: This is a sign of a one-sided strain on the joint. A possible cause is a poor fit between the socket and the ball of the joint (hip displasia). An absence of balance in the hip musculature, insufficient shock absorption from too little plié, weak feet, poor floors, and genetic disposition can also be causes of arthritis. If the arthritis is in an advanced state, the dance career should soon be terminated.

What you can do

Check your dance technique for the following:

- Am I tipping the pelvis to force the turn-out?
- Am I sitting on the standing leg?
- Am I also tensing the muscles for stretching the hip (glutaeus maximus, hamstrings) in the "en avant" positions?

- Warm up your hips before the class and rehearsals. The best would be to lie on your back and pull your knee to your body with your hand and move the leg passively in small rhythmic circles.
- Regularly stretch the turn-out muscles and the muscles which bend the hips after class and rehearsals. Especially if you have a clicking hip, stretch frequently to relax the affected tissues and reduce the risk of irritating the snapping tendon.



The Vertebral Column

In dance, a lot of mobility is required of the vertebral column. The most mobile sections of the column, the neck and the lumbar vertebrae, are put under the most strain. Often they need to compensate for a lack of mobility elsewhere. A deficiency in flexibility in the thoracic vertebrae (the chest) or the pelvis and hip area can frequently lead to excessive strain in the lumbar spine. For example, this is visible if the "grand battement" causes the lumbar area to move because the hip is too stiff. Dancers who do a lot of lifting of partners are especially susceptible to excessive strain in the lower back. This is particularly true the more mobile and unstable one is in this area.

Acute blockage of the joint: Dancers frequently can suffer from this malady. The more mobile a joint is, the more its full range of mobility is used, the more liable it is to have an acute blockage. The natural play of the joint is disturbed. The movements are severely limited and pain is the result. The sacro-iliac joint in the pelvis area, the lumbar vertebrae and the neck area are particularly susceptible to this, as are also the rib joints. Often there are also radiating pains, which are difficult to differentiate from nerve irritations.

Prolapsed discus: An acute injury which usually is preceded by a long period of degeneration of the tissue. In areas which are typically overly mobile, local strain leads to the destruction of the discus tissue. Then often one wrong movement can be enough for the core of the discus to push outwards. In doing so, it applies pressure against the spinal cord or spinal nerves. Pains which radiate into the whole leg, lack of both feeling and strength are typical signals of a slipped disk.



Strain on the back

Chronic lumbago: This is manifested by various recurrent symptoms of pain in the lower back. Usually it is caused by over straining the ligaments or muscles, but also degenerative changes on the vertebral bodies can lead to loss of mobility, pain, and to altered posture in order to avoid discomfort.

Acute Injuries

Chronic Injuries



Stress fractures: These injuries occur in the articulating processes of the vertebrae and are results of strain and nutritional deficits. A genetic influence is also possible. Stress fractures can also result from too much of a swayed back and from lifting at a too early age when the muscular stability of the back is not yet sufficient. There is a danger of developing a sliding vertebra: the vertebra slips out of its normal position. This can squeeze a nerve and cause radiating pains. As opposed

to what one might suspect, studies show that the incidence of sliding vertebrae in dancers is not more than is found in other sectors of the population. A sliding vertebra should be checked regularly. But it is usually not a reason to stop dancing professionally.

Degeneration of the cervical vertebrae: This has its origins in the innumerable micro-trauma which occur to the neck through rapid, sharp movements, for example, spotting in pirouettes. Together with the frequently occurring slanted position of the neck vertebrae, they lead to degeneration of the smaller joints between the vertebrae and to premature degeneration of the intervertebral disks.

What you can do

Check your dance technique for the following:

- Do I often stand with my pelvis tipped to the front?
- Do I often work from the lower back?
- Can I manage to keep my lower back stabilized enough during a "cambré en arrière" or an "arabesque"?

- The entire vertebral column should be evenly mobile. It is important to have a balance between flexibility and stability. Mobilize areas which are stiff and stabilize the hypermobile areas. Thus you can spread out the strain over the entire back. The strain on the individual sections is reduced.
- You should pay special attention to the mobility of the thoracic vertebrae. The more mobile this area is, the less strain is placed upon the lower back.
- Reduce the strain on your neck: "Cambré en arrière" should always be done with the head slightly turned to the side. Through the strong muscles on the sides of the neck, the strain of tipping too far backwards can be avoided.
- Stretch and relax your back after class and rehearsals. In order to stretch the small muscles of the back, you must make your back round (for example, by bending your head to your knees while sitting on your heels.) A flat back does not stretch the lumbar spine!
- Pay attention to your pelvis. The pelvis is the base of the vertebral column. A well balanced pelvis leads to the best placement of the entire column.
- Improve your technique for lifting. For this, the lifts should be done with the body stabilized and as upright as possible, not bent forward. In order to transfer the force as effectively as possible, the lifting partner should stand as close as possible to the partner being lifted. The strength should be taken from the legs and not from the lower back. In addition, breathing in at the beginning of a lift can help to stabilize and make the lift more dynamic.

The System of Muscles and Ligaments

Regardless of what part of the body, the most frequent injuries affect the muscles, ligaments and tendons. Muscle tension and strains often are part of the normal daily class situation. Sore muscles, muscle cramps, or torn muscle fibers are typical injuries.



Relaxing in the splits

Sore muscles, cramps, and tensions are signs of overworked tissues. You can quickly help the muscles to regenerate by doing exercises to relax and stretch them, or use heat, get massage and drink additional fluids.

Muscle strains and torn fibers require considerably more time for therapy and healing. The muscles which are most often affected are the hamstrings, the adductors and the muscles which lift the thigh towards the chest (iliopsoas).

- A good warm up increases the circulation to the muscles and ligaments. Thus the tissues are prepared for the strain they will be taking.
- Regularly cooling down reduces the time the muscles need for regeneration. The metabolism is increased, waste products can be quickly eliminated and micro-injuries can be more rapidly repaired. The system of muscles and ligaments is thus more quickly fit for its next work.
- Local massages, loosening and strengthening specific muscles can help the muscles to regenerate and to be prepared for their daily work.

What you should know about the System of Muscles and Ligaments

The susceptibility of muscles for injuries is increased by various factors:

- *Insufficient circulation to the muscles;*
- *Specific and general exhaustion;*
- *Insufficient stamina;*
- *Muscular imbalances;*
- *Insufficient warm up and cool down;*
- *Infectious diseases;*
- *External factors (e.g., cold temperatures).*

What you can do

Psychological Strain



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Psychological stability is one of the basic prerequisites for the dance profession. The extreme physical strain demands discipline and self-motivation. But to have success in this profession, you also need perseverance, the ability to take responsibility, for yourself and a strong will. For the artistic work one needs sensitivity and openness. Dancers are highly motivated, often going to their limits or even beyond. It should not come as a surprise that the dance profession can lead to increased injuries, both physical and psychological.

What you should know about psychological strain

Conditions in a company

A ballet company is more than just a place of work, especially for young dancers. It can be a substitute for family and friends, making it difficult to separate work and private life. Therefore, the problems in the workplace are of doubled importance. The factors of discipline, competition, monotony, and lack of contact become more crucial. Individually or combined, these factors can cause stress with all its symptoms. Corps dancers are especially hard hit, since they are often lacking an individual artistic support and supervision.

Discipline: In the daily routine of class and rehearsals this is a basic requirement for a professional dance career. Dancers must be persevering, goal oriented and concentrated. They are accustomed to accepting and rapidly applying criticism and instruction.

Competition: Short term contracts, authoritarian styles of direction, and decisions within the company, which are difficult to understand, increase the pressures of competition.

Monotony: If a dancer does not get to dance in long phases of rehearsals, then a feeling of monotony can develop. Not being cast very often for performances and changes in the casting which appear to be arbitrary can lead to a loss of motivation.

Lack of contact: Lack of regularity in the program of classes, rehearsals and performances throughout the days and weeks can make contact more difficult. Family life and contact with people outside of the theater and the company can suffer massive disturbances because of limited time. For a large part of the foreign dancers, the language barriers and cultural differences can mean an additional difficulty in finding contact to people outside of the theater.

Psychological and Social Straining Factors can be added to the objective situation:

- Beginning to study ballet at an early age can lead to neurotic development and later can increase tendencies for neurotic diseases (Personal fixations, isolation within the groups).
- The thinness often demanded by directors, choreographers and ballet masters can lead to unhealthy eating habits and can promote eating disorders. Often these are associated with extreme physical activity; the body is strained far beyond its limits.



Intense concentration before going on stage

- Expectations for performance which are too high - demands, both from yourself and from others, through parents or teachers as well as choreographers and directors - can be contributing factors in the development of diseases relevant to this profession. Trying to maintain the fine balance between obedience and inner strength can make things even more difficult.
- The social milieu with a prominent position as a stage artist and special attention from the media (positive and negative critics) can be perceived as a burden.
- A poor working climate, dissatisfaction, lack of recognition, injustices, and social insecurity can further intensify the burden.
- An absence of feedback or inappropriate feedback can reduce the motivation and the will to perform.
- The physical ability to perform declines with age, but the tendency to get injured increases. Age can be a determining factor in ending a ballet career. "Aging" is therefore often associated with sadness, feelings of loss, and existential problems.

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What can happen

Stress: This is the organism's natural response to subjective phenomena which are perceived as a threat, such as a discrepancy between the demands and what one feels are one's abilities. Stress leads to various reactions, including the stimulation of certain areas in the brain and the production of the hormone adrenaline. Long-term stress can decrease the subjective feeling of well-being and lead to diseases and functional disturbances.

Stage fright: This is a stress reaction to a high demand for performance. The adrenaline level in the blood is raised, a prerequisite for high performance. But if you have an extreme reaction, it can also lead to more intense fear with a racing heartbeat, high blood pressure, perceptive disturbances and misjudgements.

Exhaustion: This can appear if the dancer is physically and psychologically over-taxed or not given enough work. Exhaustion can lead to an increased risk of injury. Combined with poor or mal-nutrition, the ability to perform is more restricted.

Somatization: The subconscious makes a first call for attention. Even without finding an organic problem, there can be physical disturbances, which express themselves as pains. These must be taken seriously and the source should be investigated. Frequently chronic physical diseases can have their roots in the subconscious of the dancers.

Isolation: If a dancer does not have social contact outside of the company, there is the danger of isolation. Forced interruptions in the work can then lead to loneliness, existential fears and serious life crises when the main focus of life is missing.

Depression and negative moods: These can frequently be seen as signs of dissatisfaction and withdrawal. Neither challenges nor personal goals are met. The results can be self doubts and massive self-criticism which can go so far as to be psychologically or physically self-destructive.





A short break during a class on stage

Make yourself aware of the potential sources of the stresses listed above and try to avoid them.

What you can do

Relaxation: Give yourself rest, make sure you get enough breaks and enough sleep. Relaxation techniques can help to manage the stress. Methods such as Feldenkrais, Chi Gong, Alexander Technique, Yoga, Autogenic training, or Reiki can help you to deal with stress and simultaneously give you a new physical awareness.

Breaks: During physical activity, breaks are only valuable for resting the heart and circulatory system if they last a minimum of five minutes. For the body, the recuperative value of the beginning of the break is the highest. Therefore, frequent short breaks (about five minutes) are more valuable than fewer longer breaks (fifteen minutes). After longer breaks, a short period of warming up is necessary. Give yourself three weeks of continual rest at least once each year to allow the body and mind the necessary time for recuperation.

Nervousness: Intentionally confront your stage fright. Speak to colleagues about it. Prepare yourself during the rehearsals for the stage situation. Mental training can help you with this. During the rehearsals, keep imagining that you are dancing in front of an audience.

Contacts: Make an effort to gain contact to people outside of the theater and the company. Learn the language and the traditions of the country where you are working. In the long run, this is necessary for you to feel well.

Interests: Observe and work on your interests outside of dance. Keep asking yourself, what else makes you happy aside from dancing? Careers in dance, which are continually getting shorter, force you to think about what happens afterwards. A wide range of interests helps in further career and life planning.

Working together: Take on responsibility within the company. Even in small groups, vote for a speaker to stand up for your mutual interests, to speak to the direction and to represent you.

Psychological advice: If necessary, look for professional psychological help. You do not need to be ashamed of not being able to deal on your own with the enormous stress of your profession. Look for psychologists and psychiatrists who are familiar with the dance profession.

External Circumstances



The Right Dance Floor Prevents Injuries

Dancers usually work in ballet slippers, thin jazz shoes, pointe shoes or socks. Often they also work in bare feet. The direct contact with the floor is important for dancers. Yet it also represents certain dangers: the foot is barely protected; the dancer feels all types and conditions of floors directly in the joints and muscles. Therefore shock absorption is the most crucial attribute of a dance floor. The dancers' muscles and joints can only be protected from injury through a sufficient reduction of the forces which result from the landing.

What you should know about dance floors

Construction of a floor

The ideal dance floor is made of a shock absorbing sub-flooring underneath a surface covering which is accommodated to the style of dancing.

There are various kinds of **sub-flooring** which differ in their construction and mechanical qualities. One defines point elastic and surface elastic floors (formerly called sprung floors) and mixed elastic floors. The most important protective quality of a floor, the absorption of shocks, depends upon the weight of the dancer. Light-weight female dancers usually do not have sufficient force to really feel the advantages of the traditional sprung floor. Therefore surface elastic floors are only suitable to a certain extent. Mixed elastic flooring offers a good compromise: it assures sufficient shock absorption for all dancers. At the same time, the indentation which forms in the floor from the landing is negligible. An additional strain for the movement apparatus, the so-called counter swing of the floor is thus reduced.

The **covering surface** of the dance floor must meet differing needs according to the style of dance. Classical dance, especially dancing on pointe, demands a floor which has a non-skid surface. In contemporary dance, with numerous elements on the floor and frequent dancing with bare feet, the smoother surfaces can be better for avoiding both floor-burns and getting stuck in pirouettes. The floor should be selected in shades of gray. In this way the distance between the foot and the floor can be judged better than with black or white floors.

In smaller theaters and on tour as well as in the free-lance dance scene, **portable dance cloths** are used for financial reasons. These are made of different synthetics and rubber materials. These dance cloths have differing surfaces and their ability to absorb shocks is minimal. Only if they are combined with a sufficient layer of shock absorption might they be able to make an otherwise inadequate floor useable for dancers.



A raked stage

The special situation of raked stages

Left over from the renaissance and baroque eras, there are still several theaters in Europe and the rest of the world which have raked (slanted) stages. For dancers, working on a raked stage always means an additional risk of injury. In comparison to the flat stages, the center of gravity is displaced. An unaccustomed strain occurs for individual muscle groups, especially in the legs. This causes one to tire more rapidly. More intense pressure is applied to the foot. Splayed feet and bunions result more frequently.

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What can happen

Insufficient absorption of shocks from jumping can lead to excessive strain on the entire movement apparatus, with tensed muscles, chronic inflammations of the tendon sheaths, or even so-called stress fractures.

Unevenness of the dance floor with cracks, steps, or waves increases the danger of injury. These risk factors can develop if the flooring is put down when it is too cold.

Frequent changes of flooring, such as performances on tour or while working in several different theaters, force dancers to continually be readjusting their techniques to altered conditions. The change between raked stages and flat ballet studio or rehearsal stage floors overstrains the entire muscular-ligamentous system, since the axis of balance is always changing. Thus, the risk of injury increases.



The risk of slipping because of flour

Dancers frequently treat linoleum which is too slippery with various substances. To reduce the risk of slipping, they put rosin, water, also sugar water or even cola on the dance shoes or directly onto the floor. This leads to sticky spots on the surface. The results are an increased risk of injury, but also increased muscular work with premature exhaustion.

A perfect stage floor is one of the most important prerequisites for sensible protection from injury. The choice of a suitable dance floor should therefore be the highest priority for every theater and every dance company. Dance floors with the same qualities in the ballet studios, in rehearsal rooms, and on stages allow the dancers to make the best of their techniques in all situations. With an ideal floor, rehearsals and necessitated alterations of dance technique and choreography can be reduced, as can chronic overstraining syndromes and acute injuries. Speak about this concern with the persons in charge.

What you can do

Regularly cleaning the dance floor not only increases its life but also reduces the risk of accidents which are drastically increased through spots which are hardened, extremely slippery, or sticky. Tell the cleaning crew about such spots, for only you can know where the floor is the worst.

Pay attention to danger zones on the stage floor. Steps, cracks bigger than two centimeters ($\frac{3}{4}$ inch) wide, as well as loose screws and nails must definitely be avoided. There must be adequate time for the dancers to get to know the stage and its condition before rehearsals or performances and for eliminating potential deficiencies.

For rehearsals on hard unsuitable floors, it is better to use more protective dance shoes, dance sneakers, for example. This lets you protect your feet during the rehearsals and at least partially make up for the lack of shock absorption through your shoes.

The Climate in the Ballet Studio

The surface temperature of the human body is directly related to the surrounding temperature. A regulating mechanism keeps the temperature of the inside of the body at a constant 37° Celsius or 98.6° Fahrenheit. For humans it is only possible to live in a range from 35° to 40° Celsius body temperature (95° to 104° Fahrenheit). The ability to perform, however, is already reduced through variations of a considerably smaller range.

What you should know about the climate

In periods of calm, the core of the body produces more than seventy percent of the total heat of the organism. The skeletal musculature only contributes about 17 percent of the body heat. Warmth is always flowing from the inside of the organism to the rest of the body. The blood has an important role in the transmission of heat: while in the core of the body the blood is being heated, it is being cooled in the exterior (skin, hands, feet, muscles). Muscular work and a high external temperature can eliminate the big difference between the core and the exterior. At least two thirds of the energy

used in working the muscles is lost as heat. Thus more heat must be given off to keep the core temperature constant. This usually is achieved through sweating, when the sweat evaporates on the skin and the air passing by cools it. When the humidity is too high, this system is restricted; therefore certain weather conditions feel sticky.

There are four measurements of climate which affect how we feel:

- Air temperature;
- Humidity;
- Velocity of air;
- Surface temperature.

Room **temperatures** that are too high are not recommended, because they strain the heart and circulatory system unnecessarily. The following temperatures are suggested as the best temperatures for ballet studios:

In winter	17-19 °C (63° to 66° F) (Minimum)
In summer	20-22 °C (68° to 72° F) (Ideal value)

This can easily be checked with a thermometer.

The recommended **humidity** for ballet studios is between 35 and 60 percent. Low humidity makes it easier for the perspiration to evaporate. Of course, with low humidity, the mucous membranes do tend to dry out more easily. The limit for carbon dioxide in the air is 0.15 percent of the volume. The **velocity** of air should not be over 0.1 meters (4 inches) per second, since otherwise it can be felt to be an uncomfortable draft.

Floors that are too cold or which transmit too much heat can cause an undesirable climate. The surface temperature of the walls can also lead to disturbances by radiating cold.



A performance in a factory: ideal climatic conditions are not to be expected here

The Situation while Dancing

It is characteristic for dance that phases of intense physical activity alternate with short intervals of rest whether this is in class, during rehearsals, or performances. The optimal temperature of the exterior of the body must also be maintained during the breaks. Therefore, dancers should put on woolen leg warmers or other protective clothing during the breaks to prevent cooling off.

In the studio or on stage, the natural circulation of air is not really sufficient to eliminate the substances expelled by the body during exercises; the carbon dioxide, scents, nauseating substances, steam, and heat. Therefore a regular ventilation system is recommended.

In rooms that are too cold or in open air situations, the coordination of movement sequences can be disturbed. Especially low temperatures and high velocity of air (drafts) can lead to colds and to diseases in the muscles and tendons.

Temperatures that are too high make you feel uncomfortable and lose concentration with an associated reduction of performance, particularly for the coordination of quick sequences of movement.

In rooms with high ceilings there is a natural circulation of air which can be perceived as a draft. One can avoid such effects through ventilation techniques. Windows which are always opened can also lead to uncomfortable drafts in studios or rehearsal rooms. Regularly opening the windows for a short period can alleviate this situation.

What can happen



A person can accommodate him or herself to the differing temperatures with appropriate clothing. You should wear warm clothes during the breaks, especially in short breaks, to protect yourself from cooling off.

After extreme physical effort, the body cools off particularly quickly; therefore you should have something warm with you while you are taking your bows. This is especially true if you have been dancing in very thin costumes, if you have to sweat a lot, and for open air performances.

During open air performances, all of the climatic factors can extend beyond the norm. It is especially important in such cases to have appropriate clothing for the short intervals during the stage rehearsals and performances.

A sign indicating that one should wear appropriate clothing does not liberate the employer from the necessity to assure that the climatic conditions in the regularly used studios are appropriate. If the heating system and ventilation systems do not achieve the desired effect, then speak to someone in your theater who is responsible for security or your theater doctor.

What you can do

What you should know about Lighting

Lighting

Poor lighting can reduce the ability of a dancer to perform, make balances more difficult, or even be the cause of an injury.

Poor lighting is recognized by the following:

Low level of light

Up to around the age of 45 one can still compensate for a low level of light

Direct glare

for example through stage lighting

These factors usually are more disturbing than a simple low level of light.

Reflection and Mirroring

for example on shiny dance floors or in the mirror of the studio (so called indirect glare)

Incorrect selection of lights or aiming of lights are often not recognized as a disturbing factor.

Uneven strengths of Lighting

Direct Glare (see illustration below): If individual surfaces (e.g., spotlights) are much brighter than their surroundings, then scattered light affects the cornea, the lens and the vitreous body of the eye and thus leads to disturbances of the vision.

Indirect Glare (see illustration below): Reflections on shiny surfaces, especially on the dance floor or on mirrors, or light coming from spotlights on the ceiling disturb the ability to recognize the distance between the feet and the floor.



For correct lighting in ballet studios and rehearsal rooms, one should have fluorescent lights with the color "neutral-white" in combination lamps with lamella. In order to have even lighting everywhere, the lamps should be installed in an even distribution. You should never be able to see the source of the light when looking into the mirror. Rooms with light from outside are definitely preferable to rooms which have no windows. Windows which face to the north west are ideal to prevent direct sunlight from coming into the room.

Recommendations for the best intensity of light in a ballet studio

Temporary usage	<i>150 lux</i>
Permanent usage	<i>300 lux</i>
Rooms without light from outside	<i>500 lux</i>



Blinding light from the wings

Direct and indirect glare greatly increases the possibility of accidents.

Too little light makes it difficult to recognize contrasts, thus the danger of accidents is increased.

The rapid change from bright to dark puts a demand on the eyes to adjust to these altered conditions of lighting. This can lead to a short term loss of balance and to technical uncertainties.

What can happen

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When confronted with unaccustomed lighting; for example, spotlights shining directly out of the wings, lamps at eye level, direct lighting from the front edge of the stage; you should make sure you are familiar with the entire backstage situation before your rehearsals or performances.

Insufficient ability to see can influence the dance technique and the expression. Therefore you should have your eyes checked at least every three years by your theater doctor. A short-sightedness of minus one dioptre (dpt) reduces your vision by 25 percent!

The eyes are an important organ for your balance. In order to compensate for a weakness of the eyes, dancers should therefore wear contact lenses even if that weakness is minimal. There are numerous different kinds of contact lenses on the market today. Opticians or ophthalmologists can help you find an individual solution.

What you can do

Sound, Music, Volume

What you should know about Sound

To avoid damage to the hearing, aside from the maximal level of 140 decibels, the following dosages of sound should not be exceeded:

From the "Rules for Prevention of Injuries", regarding "noise"

Maximal length of noise level

85 dB(A)	8 hours
88 dB(A)	4 hours
94 dB(A)	1 hour
97 dB(A)	30 minutes
103 dB(A)	8 minutes
109 dB(A)	2 minutes

EU guidelines for "noise"

Maximal length of noise level

87 dB(A)	8 hours
90 dB(A)	4 hours
96 dB(A)	1 hour
99 dB(A)	30 minutes
105 dB(A)	8 minutes
111 dB(A)	2 minutes

The limit for the daily exposure to noise according to the European Guidelines 2003/10/EG "Noise" lies at 87 dB(A), the threshold for initiating protective measures is 80 dB(A)

Whether classical or modern, dance completely without music would be unthinkable; music intensifies the expressive qualities of dance and thus is taken for granted as a part of the dancer's surroundings, just as in a ballet studio.

Sensory perceptions like music or noise, which we perceive through the ears are called sound. They are caused by changes of pressure, which are superimposed upon the air pressure. Our ears change the pressure of sound into the sensation of hearing. The brain judges and sorts these impressions into comfortable and uncomfortable sensations. Noise is the term for sounds which are felt to be uncomfortable. Continual loud music can cause damage to the hearing if it continues long enough.

The measurable effects of sound on the body are largely dependant upon the **volume**. It is not measured as sound pressure but as a level defined in decibels (dB). The human ear can deal with volumes from 0 dB (the lowest limit of hearing) to around 120 dB (the pain level).

The pressure of sound "p" multiplied by the length of time (t) of exposure gives the **sound dosage** ($D = p \cdot t$). Noise causes a number of different reactions in the body: it increases the blood pressure, raises the pulse, influences the digestive organs and stimulates the production of hormones. When the noise dosage is too high, you can develop deafness from noise. Thus, the damage to the hearing depends upon both the volume and the time of exposure.

The effects of noise on the hearing are accumulative over the entire life-span. This should be considered for the planning of classes, rehearsals, performances, and free-time activities.

What you can do

You should not expose yourself to direct noise for long periods of time. For that reason, during the intermissions of rehearsals and performances, you should not stay directly in front of loudspeakers, even if the volume of the music is within the acceptable limits.

Dangerous Materials

Dancers rarely have to handle dangerous materials.

Annoying scents

In new buildings or renovated rooms there can be problems which are known from the realm of housing. Especially paints and flooring can emit annoying smells. Materials containing formaldehyde are dangerous to the health and therefore should not be used in ballet studios or rehearsal rooms.



Rosin is used on slippery floors

Rosin, dust

Allergies to rosin or dust can cause itching or rashes; in the extreme case, they can lead to asthma. The amount of dust in studios and especially on stages can be high, at 400 to 800 parts per cubic centimeter. Often the mixture of substances in dust can contain bacteria which can cause diseases. Regular cleaning and appropriate ventilation are necessities. If it is at all possible, you should avoid substances which can cause allergies.

Stage effects

Artificial fog, sand and water are only a few of the potential artistic effects in dance. For artificial fog, one normally uses mixtures with glycol compounds, carbon dioxide or nitrogen. These can injure the breathing apparatus and lead to symptoms such as shortness of breath, coughing, cramping of the chest, or asthma. In addition it can cause allergies. You must also pay attention to the increased risk of accident because of slipping or cooling off.

Costumes and Make-up

What you should know about costumes and make-up

Whether in a big opera house or in a small private theater: costumes and make-up are standard supplies of dancers.



Some costumes take getting used to

The **Costume** is an important part of the stage decoration. It is conceived by the costume designer according to esthetic priorities. For that, the functional aspect is often less important. A costume can be a hindrance for the dancer: big capes can cover the body, stiff material can inhibit the freedom of movement. Long trains or wide pants-legs can represent a risk of tripping and thus can be an additional cause of injuries.

The **stage make-up** can frequently cause skin irritations in dancers. The combination of make-up and sweat seem to intensify this reaction. In general, one differentiates between oil-based and water-based make-ups. Both have advantages and disadvantages. Therefore, they should be selected individually. Water-based make-up goes into the skin deeply and can easily be smeared if one perspires. It is a better choice for people with oily skin. Oil-based make-up goes on more evenly and stays on longer. But this can cause undesirable skin reactions, especially while using the lighter colors with their additives.

For dancing, **wigs** must be very well attached. Aside from hair pins, the natural adhesive mastic is used. It is a resin from the mastic bush.



Flashy make-up

Costumes

Speak to your costume designers and choreographers in advance about potential problems with costumes. It is necessary to pay attention to the following stipulations:

- Sufficient freedom of movement;
- Avoiding unnecessary causes of tripping;
- If possible, the use of elastic, stretchy materials, which ideally are also able to "breathe" and absorb sweat.

With unaccustomed costumes, you should try out the costumes in the choreography before the first stage dress rehearsals. In this way you can get used to the special qualities of the costume. This applies particularly to shoes. If you are not dancing barefoot, in ballet slippers, or on pointe then make sure you have appropriate rehearsal shoes early enough to get used to them.

What you can do

Make-up

In order to protect the skin, it is a good idea to put on a cream base underneath the make-up. This closes the pores and prevents the particles of make-up from going into the skin. Various cosmetics companies offer good products for this. It makes sense to have an individual consultation.

To remove make-up, one should use special make-up remover, creams or oils. The petroleum jelly provided by most theaters is not recommended for sensitive skin. When you are finished, using a facial tonic is recommended. It cleans the last bit of make-up from the pores and thus protects you against pimples and blackheads. Do a peeling once a week. Skin care items which are free of preservatives and perfumes are best for the skin.

If, in spite of all methods of prevention, you still get allergic reactions, speak to your make-up artists about alternative products. Various companies offer specially tested dermatological products.

For sensitive skin, it is advisable to use special oil based medicinal products to remove mastic while removing wigs. Alcohol can irritate the skin and should not be used.

To protect your own hair and the scalp, try alternating between hairsprays and hair foam.

Hygiene tips for your make-up:

- Use your own lipsticks (especially if you tend to get herpes);
- Use your own make-up sponges
 - with fine pores (for good results),
 - washable (no latex);
- Use your own hair pins.

General Recommendations



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Stamina

Traditional stage dancing trains above all coordination, speed and strength. However basic stamina is severely neglected. Studies have shown that dancers' stamina is hardly different from that of "non-athletes". Yet for practical, usable injury prevention, stamina is becoming more and more important. Certainly, there are choreographies in which dancers keep going for twenty minutes or more. But the emphasis in the daily class is on the dance technique, sufficient cardio-vascular training is not integrated into the schedule.

What you should know about your stamina



Exercises at the barre

During the dance class, the general strain is continually increasing. In the course of the class, the first exercises, which have long periods of relatively static movements and short intervals between them, develop into more dynamic, shorter exercises with longer intervals. The net duration of training during a class is all-in-all only about fifty percent of the whole time of the class. For rehearsals and performances it is a different story. During these, on the average, there are about two minutes of dancing and choreography which strain the heart and circulatory system to a maximum. The intervals are long. The net duration of strain is often only a fraction of the complete time of the rehearsal or performance.

The traditional dance class, with about fifty percent of the time spent in unused breaks, can not improve the basic stamina. The intensity of the work is too high and the net duration of strain is too short. A high level of intensity can use up the carbohydrate reserves in the muscles, if the basic stamina is not sufficient and thus lead to a definite loss of coordination.

The result is an increased risk of injury, especially during the phases of the class which demand more difficult coordination and strength. Therefore, accidents occur most frequently during the big jump combinations.

Many choreographies go to the limits of performance: not only the anatomical limits, but also the physiological limits. A good level of stamina, therefore, uses the body's resources to master the physical demands in dance with less injury and stress.

Good basic stamina helps to avoid injuries.

Good basic stamina

- Prevents you from getting tired so quickly
- Allows you to work longer and more easily with more concentration
- Reduces your susceptibility for injuries
- Improves the ability to recover
- Helps you to be able to recover even if the breaks are short
- Extends the length of your active dance career

What you can do



A break during a rehearsal

Regular cardiovascular training, three times per week for thirty to forty minutes, can be done in the form of a typical stamina sport: jogging, bicycling, aqua-fitness (exercise classes in water) or swimming.

During the dance class you can also train your stamina. You achieve this through a slight alteration of the first part of the class. The principle is that you minimize the breaks. For example, if the warm-up barre exercises are previously choreographed, the explanations between exercises can be eliminated. The duration of strain is extended and as a result, your stamina can be improved already through the daily class. The goal and the quality of the class need not suffer for this.

Recommendations for cardiovascular training specifically for dancers

- 2 to 3 times per week
- About 40 minutes, beginning with the barre or with the warm-up class up to the middle
- Limited dynamics for the exercises in the center, so that bigger groups are possible
- Two to three blocks of this per season each lasting 4 to 6 weeks
- Exercises of a medium intensity
- One choreographed class per week or for two weeks instead of changing exercises daily
- Simple combinations of movements to reduce the time for explanation and extend the time of exercise
- Corrections and balance exercises are still possible and do not influence the training effect

Getting into Shape - Detraining

The term "getting into shape" should be understood as preparation over a moderate length of time for an expected strain. As opposed to this, the "warm-up" occurs directly before a class, rehearsal, or a performance.

Only a body which is prepared in the best way can be able to achieve high performance. Regular training leads to various adaptive mechanisms. The body adjusts to the strain. Yet if the strain is increased too quickly, then you can suffer the damage of excessive strain and acute injuries. Through a gradual increase of intensity and length of the classes, you can reduce the injury rate.

Intentionally prepare yourself for the strains you are expecting. Get yourself into shape in time before the beginning of the season. During a six week vacation, you should use the first half for relaxation and recovering. During the second half, it makes sense to do general stamina training, that is, jogging, swimming, aqua-fitness, or bicycling.

After either a vacation or time off for injury, slowly but progressively increase your amount of work over the first two weeks. Only at the end of the first week should you consider doing big jumps.

During this time, integrate alternative forms of movement into your regimen and use methods to increase your bodily awareness and improve the general stability of your torso. We can recommend breathing techniques, Pilates, Gyrotonic, Feldenkrais, Alexander-Technique or yoga.

Avoid extreme positions during the first week. Accept the limited ability of your body to perform after a break. The musculature is soft and relaxed. Therefore, you should be careful about demanding and strenuous movements. Keep working within your limits.

Detraining is the gradual withdrawal from years of hard work and psychic strain.

Every form of concentrated training leads to morphological and functional changes in the body and its tissues. If you suddenly stop doing your habitual training, the body can not gradually adjust to this lessening of strain. That can lead to heart and circulatory diseases, such as heart rhythm disturbances or depressive moods through a lack of endorphins. Changes in your diet can lead to hormonal changes and to an altered

What you should know about getting into shape

What you can do



Pilates machines



Gyrotonic machines

What you should know about detraining

condition in the blood. The amount of fats in the blood increases, augmenting the risk of heart and circulatory diseases. Also, damage to the joints often only becomes apparent after the person stops dancing regularly. Muscular strength and coordination diminish and the protection of the joints through the muscular stabilization disappears. In spite of a reduction of strain, the pains increase.

Many problems can be minimized through a step by step detraining at the end of the active dance career. To do that, one should gradually replace the dance training with other methods of working and with an increase in stamina training.

What you can do

Start thinking early on about what will happen later "after dancing". Before the end of your active dance career consider alternatives for movement, which can be fun for you in the years that will follow. The extensive possibilities can help to make the departure from dance easier.

Unfortunately, as a former dancer, the athletic activity you have already done will not continue to help your state of health for long. Within just a few short months all the measurable effects of dance on your heart and circulatory system can be gone without a trace. A new field of activity can help to avoid this process.

Athletic activities to promote stamina, such as jogging, biking, or swimming, are an ideal complementary work-out for a step by step detraining. You can be flexible about determining your own intensity and length of work-out. But remember, it is better to give yourself milder but longer strain than to do short intensive work. It is advisable to do from 45 to 60 minutes of work two to three times per week. This should consume about 2500 kilo-calories in the week. This is like three hours of jogging or four hours of biking. Done correctly, this stamina training not only helps your heart and circulatory system but also helps you to maintain your usual weight.

The decision about precisely what form of training you should do is very personal. If you are looking for competent advice, find a doctor who is specialized in dance medicine. Basically, the more slowly you reduce the strain, the better it is for both body and mind.

Unfortunately, injuries often force dancers to give up their professions suddenly. Still, you should look for alternative activities. An injury which prevents you from dancing professionally does not necessarily stop you from doing other dance forms, movement therapies, or sports.

Specific detraining over the period of a year

- *First six months:*
Two or three days per week take dance class. This class should include the exercises at the barre, the warm-up training up to the small jumps in the center. It can also include the big jumps in the middle, but big jumps are not necessary for the detraining. They are too much of a strain on the system and increase the risk of injury.
Remember: a shorter, more conscious training is more effective in the long run.
- *Second 6 months:*
Dance class one or two days per week. In addition, choose athletic activities, such as body therapies or stamina training for an additional one or two days per week.

Warm Up – Cool Down

A sensible warm up protects you from injuries, regularly cooling down speeds up the regeneration process for the muscles. The body is more rapidly able to achieve high performance. This is reason enough to regularly include a warm up and a cool down as a standard part of your daily routine. Yet dancers often do not use the full spectrum of possibilities. Regular stretching is a part of the dance classes, but it is seldom complemented by other helpful measures.

Whether before, during or after the class, stretching is part of the dancer's daily work. Stretching helps to improve the mobility, to reduce muscular imbalance, to increase the performance ability, to prevent injuries and to speed up the general regeneration. Stretching is a major part of warming up and cooling down.

What you should know about stretching

Some important information about mobility:

- The flexibility decreases as one gets older. The best time to improve the mobility is shortly before puberty when the muscles become more flexible because of the changing hormones. The natural process of aging leads to a reduction of flexibility by age 30.
- Women are generally more flexible than men.
- In the course of a day, the flexibility increases.
- When the temperature of the muscles increases, the flexibility also increases. Working to warm up the muscles and warmer weather make the muscles more supple.
- Stress and mental tensions can decrease the flexibility.
- Exhaustion leads to an increase of the tension in the muscles and a reduction of the mobility.



Stretching is an important part of warming up

Various Methods of Stretching

Static Stretching: *This stretch is done through a direct passive stretch of the muscles. The circulation to the muscle is improved. However, coordination and resilience are reduced. During static stretching, one brings the muscle to its maximal length then holds it there for 5 to 10 seconds (short stretch) or for 20 to 60 seconds (long stretch). It is recommended to do 2 or 3 repetitions per muscle. Breathing out during the stretch reduces the muscle's resistance to stretch.*

Dynamic Stretching: *This uses rhythmic stretching at the end of the range of movement of a muscle, so that the tissue surrounding the muscle is stretched the most. In a cold state, there is the risk of micro trauma to the muscle. Dynamic stretching begins slowly with small movements. Then the tempo and range are increased. The stretch should be repeated 10 to 15 times.*

Contract-release Stretching: *This helps the muscles to relax. The exercises improve the mobility. Through the various stimuli to the nerves, the muscles are released. Thus it can be stretched more easily in the relaxed condition. This stretching technique can be done in various ways. The following method is recommended for dancers: the muscle is brought into the position for the stretch, then tensed for 3 to 7 seconds. Then let go of the tension and immediately go further into the stretch position. You stay here for another 10 seconds until the tension lets up. This cycle should be repeated 2 or 3 times. Here again, breathing out during the stretch can help relax the muscles.*

What can happen

Over-stretching: The strength of the muscle is reduced if one stretches too long in a static stretch. The muscle gets tired, the contractions happen more slowly. It is especially dangerous to stretch in the vicinity of the capsules and ligaments. Here you can cause scar tissue to develop, which limits the flexibility permanently.

Micro-injuries: When the protective mechanism of the muscle is switched off and either static or dynamic stretching is done going beyond the normal warning pain of tension, micro-injuries can develop. (Attention: medicines can raise the danger of injury to the muscles!) Stretching when you are cold, stressed or exhausted can also raise the risk of injury.

Instability: Stretching in the vicinity of joints which are already more flexible than the average can cause them to develop instability. Hypermobility and premature degeneration of the joints are the results.

Decrease of the Circulation: Static stretching which is held for a long time can reduce the circulation to the muscles. The tissue is not supplied well enough with nutrients and is thus in more danger of injury.

Use all of the different forms to stretch. Each one has its advantages and disadvantages. Therefore they should be tried out individually and used appropriately. Be careful about stretching when cold, while exhausted, or under a lot of stress! Excessive stretching with a partner or with stretching machines is not advisable.

Warm up: Warm yourself up before you start to stretch. Short static stretches or contract-release stretches are best for preparing the muscles for the class.

Classes: Use the stretching which is already integrated into the class. Thus, every correctly done demi-plié automatically stretches the calf muscles and helps them to stay supple. However, if you lift the heels during the demi-plié, then the calf misses its relaxation. It becomes hard and loses its ability to function fully.

Flexibility: All methods of stretching are useful for improving the flexibility. When stretching in the class after the barre or warm up, you should use the slow dynamic, short static, or contract-release stretches. In this way the muscles remain prepared to continue with the rest of the exercises.

Regeneration: Stretching increases the speed of regeneration of the muscles. Therefore stretching after class is very important. For this, long static stretches (20 to 60 seconds) or contract-release stretches are especially effective.

What you can do

What is important in the Warm Up

The warm up is more than just a brief stretch before working. It should aim at preparing the body for the training, rehearsal, and performance. In it, the muscle groups and joints which take the most strain should be given special attention. Passive methods of warming up, such as taking a hot shower or rubbing in hot creams or oils are not efficient.

Warm Up

- *General warming up (training for the circulatory system, such as bicycling, fast walking, or climbing stairs on the way to the class)*
- *Specific stretching (short static stretches or contract-release stretches)*
- *Passive mobilization of the joints without the body weight on them (important for the feet, the knees and the hip)*

What is important for the Cooling Down

The goal is to eliminate from the muscles, as quickly as possible, the products which are broken down through working in the class, rehearsals, or performances. Thus the muscles can regenerate more quickly and therefore are sooner able to work hard again.

Cool Down

- *General relaxation (e.g., consciously breathing deeply)*
- *Specific stretching (long static stretches, 20 to 60 seconds, or contract-release stretches)*
- *Muscular relaxation (locally applied heat, warm showers, sauna, and massage)*
- *Easy bicycling, running, or walking*

What you should know about Relaxation and Regeneration

Relaxation and Regeneration

Recovery, in the sense of relaxation and regeneration is the opposite of a physical and mental strain. After working for a certain amount of time, you get the feeling of being tired. This is characterized by

- Reduced ability to perform;
- Slowed and uncertain movements;
- Impaired coordination;
- Loss of physical motivation.

Exhaustion is the consequence of metabolic processes in the muscles. These processes include the reduction of molecules which supply a lot of energy and the increase of byproducts of metabolism (such as lactic acid), a loss of potassium and a reduction of the level of stored sugars (glycogen) in the muscles. The better your basic stamina is, the longer before you feel tired.

But exhaustion is also important; it protects the body from doing too much. Every body can withstand a certain, individual highest level of strain. If the strain placed on the body is too much, and the time for resting is insufficient, then symptoms of overtraining can show up. Rest and relaxation help the body to fill up its supply of energy for the next work it will do.

What can happen

The warning signals of overtraining:

- *Stagnating performance;*
- *Delayed recovery from classes, rehearsals or performances;*
- *Increased sensation of being under stress and strain;*
- *Lack of enthusiasm;*
- *Lack of appetite;*
- *Anger or depression;*
- *Sleeping poorly;*
- *Frequent infections.*

The condition of overtraining can not be eliminated through normal rest. The relationship between strain and recuperation has been persistently disturbed. An advanced stage of overtraining can lead to chronic limitations of performance. The results can include a collapse of the immune system, that the hormones get out of balance, or that you suffer from depressions.

A temporary state of exhaustion after a hard class or a strenuous rehearsal or performance is distinctly different from overtraining. But these are often hard to differentiate, for there is often only a slight difference between an optimal burden and too much work. In addition, personal ambition and pressure to perform can cover up the warning signals.

What you can do

Time: Take time for rest and relaxation. Use the free day as such.

Nutrition: As a dancer, for many years you are as active as a professional athlete and also need a professional diet. You can only prevent a loss of coordination, which can come from emptying the carbohydrate reserves in the muscles, by eating enough carbohydrates (also see the chapter on "diet" page 56).

Sleep: Make sure you get enough restful sleep.

Hobbies: Develop interests which go beyond the theater and dance. This also helps you to relax.

Being lazy: Learn to simply do nothing and to enjoy it.

Relaxation techniques: Numerous body therapies and relaxation techniques can help to improve the regeneration of the body. Test them out to find what helps you. There are many possibilities: Autogenic training, Alexander Technique, Yoga, Chi Gong, or Feldenkrais are only a few examples of many relaxation methods.

First Aid

If an accident happens during a class, rehearsal or performance, quick and competent first aid is important. The most frequent injuries affect the movement apparatus. So called soft tissue injuries to the muscles, tendons, ligaments, or capsules are high on the list of most frequent accidents.

Injuries to the tendons, ligaments, and capsules always lead to a tearing of small blood vessels in the vicinity of the muscles. Internal bleeding occurs, which rapidly spreads to the surrounding tissues, resulting in swelling and pain from the pressure. All these factors together can have negative effects upon the healing process. Therefore, quickly stopping the bleeding is a top priority.

For an effective first aid of the injuries to the soft tissues, one follows the RICE method. It clearly and simply describes all the important steps for caring for an injury in stressful situations. This immediate care can increase the speed of the healing.

The RICE method for first aid of soft tissue injuries

- R** *Rest*
- I** *Ice (cooling with cold packs or cold water)*
- C** *Compression with a compression bandage*
- E** *Elevation of the affected part of the body*

What you can do

Make sure you know about the first aid for soft tissue injuries according to the RICE method. Also inform your colleagues about this efficient method for acting in case of injury.

Make sure you know where to find the necessary supplies, the compression bandages or elastic bandages and cold packs, as well as the location and availability of other first aid materials.

Fit through Nutrition – Strong Bones

Correct nutrition is not only a complex but also a very individual subject. What follows are several main ideas which should help you to be aware of your nutrition so as to stay fit to dance.

In each second, there are about 10^{30} (a 1 with 30 zeros after it) chemical reactions which take place in the body. Every day 600 billion cells die. Just as many are newly created and fit themselves into our organic systems without a hitch. Physical activity helps these processes take place: the daily workout leads to micro-injuries in the tissue; poisonous substances and so called free radicals are released. Through complex biochemical processes, the injured tissues are renewed. Poisons are buffered and removed from the body; the mechanisms for regeneration are fully activated. Yet without the necessary energy and building blocks, these processes can not function. Our nutrition is important to supply for these needs.

What you should know about your Diet

An optimal adjustment of the diet for the burden of dancing is not only good for improving performance. It also improves the immune system and prevents injury and diseases. The right foods can increase the speed of the important regeneration processes of the body. For that, you need a balanced and varied diet. The recommendation of "eating fruit or vegetables five times a day" is even more important under physical strain.

Carbohydrates: They are easily digestible and provide energy quickly. A balanced blood-sugar level is especially important in dance. If the blood-sugar level sinks, there is the danger that the brain and the nerves may be under-supplied. That can lead to breaking out in a sweat and have circulatory problems, concentration problems, and food cravings. The risk of injury increases. On the short term, a piece of sugar may help to quickly raise the blood-sugar level. But be careful! Large amounts of rapidly digestible glucose; for example fructose or energy bars; within a short time can lead to massive reduction of the blood-sugar levels with all sorts of symptoms. On the other hand, complex carbohydrates prevent negative effects much more effectively.

Proteins: These serve the body as building blocks and insure a rapid regeneration and an optimal functioning of the metabolism. As opposed to carbohydrates, which serve to supply the energy before and during work, proteins are especially needed after exercising.

Mineral and Trace Elements: They support numerous metabolic processes in the body as catalysts. Dancers often suffer from a lack of potassium and magnesium. In addition, female dancers often have difficulties with a lack of iron. These deficiencies can lead to the following symptoms:

Potassium Deficiency: weakness of the muscles, general lack of drive, tiredness
 Magnesium Deficiency: muscle twitches and cramps, quivering hands
 Iron Deficiency: tiredness, lowered performance readiness, anemia

Appropriate Fluids: When we perspire, our bodies lose minerals. Fluids can replace these minerals and at the same time return water to our systems. According to the length and intensity of the physical workout, there are variations in the concentration and the chemical composition of the sweat. This varies according to temperature, humidity, physical condition and nutritional status of the dancer. Already in the case of a minimal loss of water there are measurable reductions in performance. A loss of 2 percent of the water reduces the performance by 20 percent. If higher losses of mineral contents are not rapidly replaced, general physical and mental exhaustion can appear, causing weakness of concentration and even functional disturbances in the muscles. The risk of injury is increased.

Supplying Sufficient Energy: The body requires sufficient energy for the physical ability to perform. In dance you only use around 300 kilo-calories per hour, which is much less than generally assumed. Still, it is essential to have a sufficient supply of energy. Carbohydrates are the best suppliers of this energy, since they are found directly in the muscles to be ready to release energy.

Injuries, Poor Performance and General Lack of Drive: These can develop when the body does not have enough nutrients, vitamins or minerals available. Then the organism reduces its energy household; substances within the body are broken down, and the regeneration phases of metabolism are increased in all organ systems. As a result, the general ability to perform is limited.

Hypoglycemia: In phases of extended physical activity (during the rehearsals or performances) the carbohydrate reserves in the muscles and in the liver are depleted and the blood-sugar level sinks. Circulatory problems and lack of concentration are often the first indication that this is happening.

Eating disturbances: Female dancers are especially prone to such problems. Often, various diets are used, sometimes to the extent of denying the body food to achieve the physical "ideal" for a dancer. Whether this is because of pressure from company



Loss of fluid due to extreme perspiration

What can happen

Warning signals which indicate the beginning of eating disorders:

- *Weight reduction beyond the goal weight*
- *Extreme physical activity*
- *Secretly eating with a bad conscious*
- *Intensively worrying about others related to their eating habits*
- *Repeatedly vomiting after meals*

directors, teachers, or choreographers, or because of the desire to "look like a dancer", the result is the same. To achieve the ideal weight some people often take laxatives or medicines to reduce the appetite. Other methods some dancers use to lose weight include throwing up or wearing sweat-pants. Frequent results of manifest eating disorders include reduced ability to perform, circulatory problems, dizziness and lack of concentration, but also injuries, osteoporosis and depressions.

Carbohydrates: You can most easily keep the blood-sugar level balanced by eating complex carbohydrates with lots of fiber. Noodles, rice or potatoes as well as fruits and vegetables are ideal for this purpose. Before classes, rehearsals or performances, you should never replace a healthy balanced meal containing lots of carbohydrates with refined sugars in the form of energy bars, chocolate or sweets. To fill up the energy reserves in the muscles, you should eat carbohydrates within the first two hours after working. In this manner, you can increase these reserves in the muscles. All together, about 60 percent of your diet should consist of carbohydrates.

Protein: Especially in phases of hard physical work and when you are injured, proteins are important as building blocks. Therefore, during intensive rehearsal periods and in case of chronic inflammations you should intentionally eat sufficient protein.

Fluids: It is important to quickly and sufficiently replace the fluids one loses. Basically any drink which is free of alcohol or caffeine is suitable. During rehearsals or performances the so called isotonic or hypotonic drinks are advisable. You can easily make the latter yourself: a mixture of five parts water with one part fruit juice provides the body with sufficient electrolytes. Because they also contain carbohydrates, these drinks also serve to refill the energy reserves in the muscles at the same time. As opposed to this, the intensely advertised "light" products are not recommended. For a class or rehearsal of less than an hour, pure water can be sufficient to replace fluids.

Important rules for replacing fluids

- *Drink before you get thirsty! You only feel thirsty when you already are in need of fluids. You should also drink during class, rehearsals and performances!*
- *You do not only lose fluids from sweating. Just from breathing and the bodily metabolism, we lose about a half a liter (a pint) of water per day. When we are physically active this is increased even more. This loss must also be replaced. Two liters (over half a gallon) of fluids per day is the absolute minimum.*
- *Frequent small amounts of fluids are better than infrequent big drinks.*
- *Slightly cooled drinks help the body to absorb fluids more quickly.*
- *Do not drink carbonated beverages before or during class! They are absorbed slowly and therefore can be bothersome during physical activities.*
- *Coffee and alcohol rob the body of fluids. Therefore, they are not appropriate for replacing the fluid reserves of the body.*

Smoking and coffee: Nicotine and caffeine both are damaging to the body. This is especially true for dancers. The consumption of cigarettes and coffee are a strain for the metabolism and raise the general time for regeneration. Protective substances in the body are tied up and thus numerous measures to repair the organism are prevented. Muscular injuries and inflammations of tendons, as well as degeneration and osteoporosis can result.

Time Management: Consciously plan your meals. Eating small meals several times per day is better than eating one big meal. Test your individual situation: what amount of time do you need between meals and dancing to feel well? Don't forget, even a juice with mineral water gives you carbohydrate energy.

Reducing: When eating, take the motto: Not a lot, but balanced. Through additional training for stamina, the unneeded pounds disappear by themselves. And coincidentally you improve your general fitness.

Eating Disturbances: Disordered eating is a complex problem. Only rarely can you get this under control on your own. Be completely honest with yourself and examine your daily eating habits. If necessary, get professional help. It is not possible, in the long run, to work as a dancer without a sufficient and balanced diet.



Many dancers smoke

Although osteoporosis is known as a disease of older women, it is unfortunately also a problem which should not be underestimated in young female dancers. Men are only affected in rare cases. Osteoporosis is a metabolic disease of the skeleton. Through disturbances in the bone tissue and loss of bone weight, an increased loss of bone substance develops: the bones become porous and break.

Various factors influence the development of the bones. Physical activity, a balanced hormone household and a healthy diet usually lead to a good bone density. Extreme amounts of physical activity, however, can damage the bones. The high level of strain on the body of female dancers is often combined with a low weight. Often this leads to an imbalance of the hormones and the irregularity or cessation of periods. Although this might be "practical" for daily training, it is usually a signal that there is a lack of estrogen, the key hormone for healthy bones. Together with an unbalanced diet, this leads to decreased development of the bones or even to a loss of bone substance. There is an increased danger of fractures.

The development of the bones is already complete by age 25. By the age of 30 the body already starts to tear down the bones. Thus the behavior during the youth and the growing years establishes the foundation for the stability of the bones as an adult.

What you should know about Osteoporosis

Risk factors for osteoporosis

- Hereditary factors
- Being underweight
- Late onset of the first periodic bleeding (at age 14 or later)
- Irregular or absent periods
- Low intake of calories and calcium
- Consumption of nicotine and caffeine
- Insufficient daylight, e.g., when spending too much time in ballet studios and on the stage under artificial lighting

What can happen

A "thin" bone often can no longer sustain the extreme burden of dancing. Even small injuries can lead to fractures. What is especially feared is a stress fracture: under repeated strain, the bone simply breaks. Rips in the bone structure develop. Stress fractures often occur in the metatarsals and in the shins. This occurs most frequently in young female dancers. Stress fractures take a long time to heal. They can also mean the end of a professional dance career.

What you can do

Prevention is the best therapy. Even though osteoporosis is largely influenced by genetic factors, there is still a lot you can do to prevent it.

Eating a calcium-rich diet: This can help prevent osteoporosis. Calcium improves the bone density and reduces the degeneration of the bones. The recommended dosage is 1000 mg of calcium per day.

Tips for the daily consumption of calcium

1. Choose fruit juices and fruit drinks which contain added calcium. Through the vitamin C in the juice, the body can absorb the calcium particularly well.
2. Eat soybean products frequently. Aside from soy milk with extra calcium, there are also drinks, puddings and a type of "yogurt" made from soybeans. Pay attention in all these products that they have extra calcium added to them. Soybeans do not naturally have enough calcium to replace milk fully.
3. Vegetables which are especially rich in calcium include: green cabbage (212 mg Ca in 100 g), fennel (109 mg Ca in 100 g), broccoli (105 mg Ca in 100 g) or man-gold (103 mg Ca in 100 g). In preparing them, make sure that the vegetables are steamed in just a small amount of water. Calcium is water soluble and would otherwise be thrown away with the water used for cooking.
4. Drink mineral water which contains lots of calcium (at least 150 mg Calcium in a liter or quart), also if you are drinking mixes with fruit juice. Also use this kind of mineral water in preparing food. Ask your local water works for the calcium concentration of your tap water.
5. Avoid the typical foods which rob you of calcium, such as soft drinks with phosphates, namely colas or fatty sausages.

Vitamin D: Vitamin D is essential in order to store calcium in the bones. The body can produce this vitamin on its own with sunlight. Twenty minutes every day of being outside are already enough to tank up on vitamin D. Use the breaks to leave the ballet studio and the theater to get some fresh air.

Estrogen: This is the key hormone for the development of bones. A late onset of the period, or irregular or absent periods are warning signs for a lack of estrogen. Often the cause is being underweight. Speak about this with your gynecologist.

Ideal weight: Whoever keeps an ideal weight reduces the risk of getting osteoporosis. Calculate your BMI (Body Mass Index) according to the following formula. If your result is under 18, as a woman, you should be extra careful to eat a balanced and calcium rich diet. A few extra calories also would not hurt.

$$\text{BMI} = \frac{\text{Body weight in Kilograms}}{(\text{Height in Meters})^2}$$

Bone density: The density of the bones is measurable. Ask in your family about osteoporosis. If you have relatives with osteoporosis, or in case of certain risk factors, having the bone density determined is advised for women over the age of 35.

Planning for Classes and Rehearsals



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A good plan for classes, rehearsals and performances is a necessity for the prevention of injuries. For that, it is not only important to observe the performance abilities of the different times of day but also the vital time for relaxation and regeneration in the course of the season.

For about 50 percent of the population, the ability to perform depends upon the time of day. Thus, the best time for working is between 8:00 and 10:00 AM and between 4:00 and 6:00 PM. The physical ability to perform reaches a low point between 2:00 and 3:00 PM. After 8:00 PM the ability to perform decreases continuously. These times can be subject to strong individual deviations. They can also be altered by habits.

In professional dance there are two basic forms of planning the daily shedule.

A continual rehearsal day

Beginning at 10:00 AM, ending around 6:00 PM, with a lunch break of around 45 minutes.

Advantages:

- *The physical demands are accommodated to the daily rhythm of activity.*
- *Only during evening performances are you working outside of the regular daily rhythm of peak performance.*
- *A lunch break of up to an hour enables you to stay sufficiently warm to continue working afterwards.*
- *The time for regeneration, including the night's sleep, is more than twelve hours.*
- *If there is no performance in the evening, then you have that time free. Social contacts can be maintained and responsibilities outside of the theater can be met.*

Disadvantages:

- *Not being accustomed to working for a maximal performance during the times when the evening performances would take place.*
- *The time for regeneration in the afternoon is short.*

A divided rehearsal time

Two blocks of four hours of rehearsals mornings and evenings with up to four or five hours between.

Advantages:

- *The long time in the afternoon for relaxation.*
- *Being used to the physical strain of performances through the regular rehearsals in the evenings.*

Disadvantages:

- *The body cools off during the afternoon break. Without sufficient warm up before the evening rehearsal, there is an increased risk of injury.*
- *A short amount of time for regeneration between the rehearsal days.*
- *The travel to the workplace is doubled.*
- *The strain during the evening performances lies outside of the usual daily peak.*

What you should know about planning for Classes and Rehearsals

The Course of the Performing Season

Performances can either be distributed evenly throughout the season or be in blocks, with more free time following the blocks for regeneration. In the free-lance dance scene, irregular performances with long intervals between individual performances are not unusual. The basics for general physical fitness for these performances should still be observed.

At the beginning of the season, the priorities are for building up general fitness and training the technical abilities. This phase for getting into shape should last about two weeks. Early premieres shortly after the beginning of the season should therefore definitely be avoided.

After about six months, about two weeks time for relaxation is needed to prevent injuries. For this, the schedule of rehearsals should be minimized and the intensity and technical demands in the classes should be reduced.



Ballet class

By dividing up the rehearsal plan into periods, the long term ability to perform can be improved. Up until fourteen days before a premiere, high demands should help to improve the condition. The level of demands achieved in this way before a premiere should be maintained during the second week before the premiere and finally during the last week it should be distinctly reduced. The final dress rehearsal should take place two days before the premiere. In this way the dancers are able to show their full potential on the day of the premiere.

Dancers need several days time for regeneration and relaxation after the premiere. After a free day, the dancers should begin with slow, technically controlled regeneration training.

Physical and psychological overloading can have several causes: insufficiently getting into shape at the beginning of the season, a lack of periodic planning or intensive phases of performances without sufficient time for regeneration. Acute and chronic injuries, exhaustion or even a burn-out-syndrome can follow.

What can happen

Within your company, consider the advantages and disadvantages of continuous or divided rehearsal days. Make a decision as a group. In any case, it is important that there be continuity in the daily planning, whether this is with continuous or divided plans.

What you can do

In the case of the divided rehearsal days, the phase towards the end of a rehearsal period should include run-through rehearsals in the evenings at the times of the performances. In this way the dancers more easily get used to the demands at that hour.

As far as possible, rehearsal plans should not be vague. Try to insist upon a plan that states, as early as possible, what will be rehearsed when and with which dancers.

On the day after a performance, try to arrange the morning class to start a bit later.

Effective rehearsals are important. Nearly 80 percent of the accidents occur during rehearsals of known choreographies. Often less is more. In regards to injuries, be particularly alert during rehearsals with frequent repetitions.

Breaks during the rehearsals should be as short as possible. During longer breaks, pay attention that you do not get cold. Put on appropriate clothing.

Towards the end of a rehearsal day, you should avoid complicated movements if possible. Two thirds of all the acute injuries happen at the end of a rehearsal day.

Request sufficient rehearsals on the stage which are not just in the last minute. For effective injury prevention, these are absolutely necessary.

Avoid working under pressure. Even if the time is short, more than one run-through full out per day does not make sense.

Use the periodic planning developed from sports medicine studies, which can be accommodated to fit the individual needs of the dance world. For appropriate advice, check with a dance medicine specialist.

Diseases Relevant to this Profession

Dancers demand the most of their bodies even in the smallest of joints. Even a minimal decrease in the ability to perform, an increase either in the amount of time working, or in the intensity of the work can lead to pains or even disabilities, especially in the areas of the body which are under the most strain. Prompt attention is important.



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There are many diseases which can cause limitations in your dance profession. These can be collectively entitled "diseases relevant to this profession". What is meant are all diseases which have an essential influence on the dancer's performance, regardless of how the diseases developed.

The following table gives an overview of the diseases relevant to this profession.

Diseases coming from Working Conditions	<i>These are diseases and functional disturbances for which the professional activities have influenced the development, the course of the disease and the prognosis. The work is just one factor of many, yet the prerequisites for an occupational disease are not met. The employer is responsible for prevention of dangers to the health coming from the work.</i>
Occupational Diseases	<p><i>These are diseases for which the greatest probability is that their cause - the initiating factor - is to be found in the dancing. They are included in the list of occupational diseases which have been recognized by the lawmakers. The diseases counted as occupational diseases relevant to dance are</i></p> <ul style="list-style-type: none"> • <i>Diseases of the tendon sheaths/associated tissues of these, as well as the tendons- or muscular insertions (BK-Nr. 2101)</i> • <i>Meniscus damage (BK-Nr. 2102)</i> • <i>Bursitis (BK-Nr. 2105)</i> • <i>Diseases of the vertebral column having to do with disks (BK-Nr. 2108)</i>
Accidents in the Workplace	<i>A workplace injury involves a situation, whereby during a safe activity, events occur to the body from outside and lead to damage to the health. In dance, workplace accidents are often difficult to distinguish from occupational diseases. Therefore, special attention is required when describing the process of the accident, in order to completely and obviously present the accidental injury as such. To be certain, dance medical advisory specialists should be consulted. Principally, the injuries in the workplace are treated like occupational diseases.</i>
Constitutional Diseases and Diseases coming from aging, as well as accidents happening outside the profession	<i>Dance does not play a role, or plays only a minimal role as a cause of constitutional diseases and diseases coming from aging as well as by accidents occurring outside of the profession.</i>

Most diseases relevant to the profession of dance are related to the movement apparatus. In the chapter "Physical Strains", the most important zones of strain have been discussed in detail.

Today, stage dancing involves numerous different styles of dance. Aside from classical ballet, we see that contemporary dance, jazz, tap dancing, as well as hip-hop and street dance have all found their places on the stages of our theaters. Therefore dancers must be trained in a variety of styles. They can not just rely upon doing only classical ballet. Dancers must be able to do a variety of different styles and be in the position to learn a new vocabulary of dance quickly.

Just as the styles of dance are varied, so are the zones of the body which are under the most strain for the dancer. Frequent changing from one style to another entails a higher risk of injury. This is especially so if the daily class is not sufficiently accommodated to the specific needs of the choreography. In numerous theaters, the morning class is based upon strictly classical criteria, while the rehearsals and performances use a contemporary vocabulary of movement. This is a discrepancy which again and again is a cause of injury.

For many dancers, a full time contract in a company is no longer the normal routine. Short term contracts depending upon projects, with irregular, intensive rehearsal periods and interruptions depending upon productions often make it difficult to have a continuity in preparation for the strains of the work.

Classical Dance

In the 17th century, classical dance developed in France out of the prototype of court dances. Rules were made such as the typical turning out of the legs, the accentuation of the vertical axis, a technique that was aimed at overcoming gravity and presenting all the movements to the front, towards the audience. This classical dance technique was refined and perfected through the Ballet Russes, continued by George Balanchine the founder of American ballet, and brought up to the present with many innovative styles of dance, such as that of William Forsythe.

Classical ballet serves as the basis and the standard training for numerous dance styles. Even modern or jazz dancers regularly take ballet classes in order to keep their bodies in good shape.

The skeletal and Movement Apparatus

Diseases:

- Chronic injuries and strains of the movement apparatus, especially of the feet, knees, hips and the lower back.

For a detailed description of the problems, overloading and diseases of the movement apparatus, see the chapter, "Physical Strains", p. 16 and following pages.

The Heart and Circulatory System

Diseases:

- Low blood pressure associated with tiredness, dizziness, or weakness of performance or concentration;
- High blood pressure (rare).

Classical dance only trains the heart and circulatory system to a small extent. A strain in the sense of stamina training for the heart and circulatory system does not happen. Professional stress can be seen as an influencing factor for high blood pressure.



The Nervous System

Diseases:

- Damage due to pressure on nerves on the inside of the foot (Tarsal tunnel syndrome) with tingling, disturbances to the sensitivity and weakness of muscles;
- Compulsive diseases (neuroses) and psychoses.

The cause of the tarsal tunnel syndrome is an intensive tipping of the inner side of the foot to force the "en dehors". Shoes and shoe ribbons which are too tight can also elicit a tarsal tunnel syndrome.

Extreme orientation towards discipline and performance in early childhood can promote the development of neuroses.

Skin

Diseases:

- Allergies promoted by the use of make-up and rosin or exposure to dust or irritating substances used in the stage technique or sets;
- Allergic reactions of the skin to the body's own neurotransmitters emitted in the perspiration, or as a result of increased nervous tension is called nettle-rash (cholinergic urtikaria).

While dancing on the stage, it is impossible to avoid contact with the substances mentioned above. The development of sweat is also unavoidable. However, through individual treatment with medicines and good care of the skin you can alleviate the skin irritations and the itching. For frequent showers you should use so-called pH neutral soaps and look for cosmetics without perfumes. Be careful about clothing for classes which are too tight: pressure and friction can intensify skin irritations.

How you can avoid injuries to the skeleton and movement apparatus and how to recognize them early enough has been discussed in the chapter "Physical Strain", p. 16 and following pages.

A general training for stamina and a healthy lifestyle improve the resilience of the heart and circulatory system. With that you also avoid injuries to the muscles, ligaments and bones.

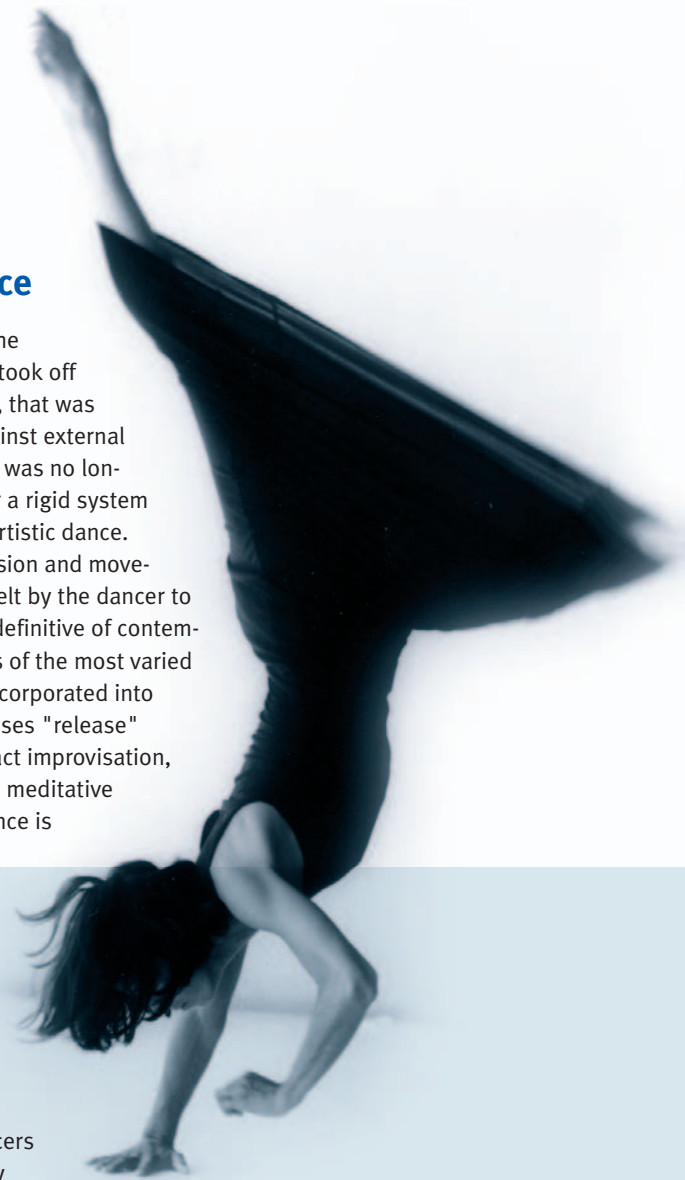
Reduce your stress in your working day. You can learn more about that in the chapter "Psychic Strains", p. 30 and following pages.

What you can do

Contemporary Dance

Around the year 1900, when the forerunners of modern dance took off their ballet shoes and corsets, that was more than just a rebellion against external appearances. From then on, it was no longer just a certain technique or a rigid system which determined what was artistic dance. Instead, the individual expression and movement sequences which were felt by the dancer to be internally motivated were definitive of contemporary dance. Today, elements of the most varied directions of movement are incorporated into dance technique. Whether it uses "release" technique, break dance, contact improvisation, or Oriental combat sports and meditative techniques: contemporary dance is multi-faceted. It ranges from dance theater to highly acrobatic athletic dancing.

The conditions for training, the strains and the typical diseases can differ according to the style of the modern dance. It is important that the daily classes prepare the dancers sufficiently for the strains they have in their work, whether this be "Butoh" or acrobatic "New Dance". According to the style one should do special exercises for the acrobatic elements, the technique of falling or to strengthen the arms.



The Skeleton and Movement Apparatus

Diseases:

- "Twisted ankles" (supination traumas);
- Fractures of toes and metatarsals;
- Acute injuries to the knee (for example: torn anterior cruciate ligaments);
- Acute blockages to the vertebral column or ribs;
- Chronic injuries and overwork diseases of the feet, knees, hips, and the entire back, as well as the shoulders and wrist joints.

Contemporary dance includes numerous soft, relaxed movements. They are often hardly even controlled by the muscles. Primarily in the vicinity of the knee and ankle joints this can lead to an increased risk of injury, during quick changes of direction, dance steps on the knees, or floor work. Dancing frequently in bare feet can raise the danger of breaking bones in the feet through external influences. Swinging, uncontrolled movements of the torso can lead to acute blockages in the entire vertebral column, especially the thoracic (chest) vertebrae, ribs and cervical (neck) vertebrae.

The chronic overwork symptoms of the legs and back are similar to those in classical ballet. In addition, there are injuries of the upper extremities through overuse and through accidents. A detailed description of problems, overwork injuries and diseases of the feet, knees, hips, and vertebral column can be found in the chapter "Physical Strain", p. 16 etc.

The Heart and Circulatory System

Diseases:

- Low blood pressure associated with tiredness, dizziness, weak performance;
- High blood pressure (rare).

Contemporary dance also does not train the heart and circulatory system well. Mostly the classes also have only short exercises with a high intensity. A choreography of several minutes is usually too high powered to train the heart in the sense of stamina training.

Between engagements keep yourself fit through regular classes. It makes sense to do training for stamina even in phases of regeneration to maintain your general performance ability.

Train for what the choreography demands. Regular classical ballet class does give a good general basis. But it can not replace a concentrated training in the specific style of contemporary dance.

How you can go about preventing injuries to the skeleton and movement apparatus or can recognize them early on is to be found in the chapter "Physical Strain", p. 16 etc.

What you can do

Jazz and Show Dance

Jazz dance has its origins in the Afro-American culture. At the beginning of the 20th century, this style of dance developed into a form all its own. It was influenced by many dance techniques and individuals. Jazz-dance is fascinating because of the movement patterns, which are often bizarre, with a high demand for flexibility on the part of the dancers, frequently combined with acrobatic elements and difficult technical combinations.

Ideally, the body of the jazz dancer is very elastic, without too much tension in the muscles. In this way they can best achieve the sudden stops, pauses, and contrary movements as well as the simultaneous activation of different movement centers of the body. The central method involves isolated movements of individual body parts. This demands an ability for exceptional coordination and flexibility of the whole body.



The Skeleton and Movement Apparatus

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Diseases:

- "Twisted ankles" (Supination traumas);
- Muscular injuries, especially to the back, the thigh or the calf;
- Chronic overwork symptoms of the knees (e.g., irritations of the capsule and ligament systems), the lower back and the shoulders.

Acute injuries happen especially to the ankle joints. Directly falling on the knees or uncontrolled movement passages can lead to injuries in the knee area and to an acute muscle strain of the legs.

Frequently stretching the lower back over the limits can be the cause of repeated chronic back pains.

Detailed information about problems, overstraining and diseases of the legs and the lower back can be found in the chapter "Physical Strain", p. 16 etc.

What you can do

Between shows, keep yourself fit with regular classes. A sensible training for stamina can also be a help in phases of regeneration, to maintain your general fitness level.

Train for what your choreography needs. While regular ballet classes do offer a general basis, they can not replace a specific jazz training.

Use "Dance Sneakers" now and then during long rehearsals on hard floors to take the pressure off your feet and protect them.

If you want to know what to do to avoid injuries to the skeleton and movement apparatus or to recognize them early on, see the chapter "Physical Strain", p. 16 etc.

Tap Dance

A combination of two hundred year old traditions of dance from West Africa, Sudan, England and Ireland has been known since the 1920s as tap dance. Along with jumps and other dance elements, it formed American tap dance. Typical for this form of dance are the tap shoes, of different types according to the specific style. The typical tap dance shoe is similar in style to street shoes. Yet in addition there are metal plates screwed onto the shoe soles at the heel and ball of the foot. The dancer taps on a relatively hard stage to make the desired sound. The dance technique requires a release of the heel and a continual pulling of the toes into the flexed position. This makes it possible to do easy, isolated movements from the foot and the ankle. Therefore the feet and legs are put under a special strain.

Skeleton and Movement Apparatus

Diseases:

- Achilles tendon irritations;
- Irritations of the metatarsal heads;
- Overwork of the knees.

Continually working on the balls of the feet puts a strain on the calf muscles and leads to irritations in the Achilles tendons. Repeated jumps and hitting the ball of the foot on the hard floor can cause the transverse arch of the foot to drop. Thus the physiological form of the foot is altered and the primary strain is placed upon the heads of the third and fourth metatarsals. Overwork syndromes and pains are the result.

Information about problems, overwork syndromes and diseases of the knee can be found in the chapter "Physical Strain", p. 16 etc.

Before doing tap dance, be sure you warm up your feet and legs sufficiently.

Pay attention to the axes of your legs in the training. While continually bending the knees, it is important to make sure the distribution of weight on the joints is as good as possible.

Stretch your feet muscles after the class. For that, pay special attention to the calf muscles. These should also be stretched now and then during the class. During several of the dance steps, it is possible to put the heels down and relax the calf.

To take the pressure off the muscles, it would be good to dance on soft floors now and then. The sound may be reduced, but you will feel how the feet and legs relax.

Now and then during long rehearsals try wearing padded shoes, for example, "Dance Sneakers". One can also practice the technique and coordination for the feet in soft, shock absorbing shoes.

Additional physical training is important. In order to train the coordination, contemporary dance or jazz classes would be best.



What you can do

Social Security

In the life planning of many dancers, social insurance is severely neglected. Bureaucratic hurdles do not make it easy to find one's way amid the tangled mess of insurance and social taxes. And yet, the unusually short careers in the field of dance make it particularly important to plan early for the time after dancing.



The Normal Case

If a dancer is working in one of the theaters given government funding, a lot of the formalities are taken care of automatically. The fees for health insurance, geriatric care insurance, retirement, unemployment and stage insurance are all directly taken out of your gross wages. The theater pays half the costs.



Acrobatic elements

The **mandatory health insurance** can be voluntarily selected by a dancer. The switch to a private insurance is only possible with a certain minimum income. Aside from the mandatory health insurance, it is often advisable to have an additional private insurance, for which one can select in detail the specific benefits one wants.

As a rule **retirement insurance** is handled by the Federal Insurance Company for Employees (BfA). One can only hope to have a sufficient pension through working long enough and having a good salary. Both are quite rare in the case of dancers. Therefore an additional private retirement insurance makes good sense. There are lots of possibilities: whether one chooses a "Riester Pension", a group

contract for dancers with the Gerling Concern, or a life insurance for artists with the "Versorgungs Union" of federal and state supported enterprises (a union of twenty different life insurance companies): in any case an individual consultation is important.

It is a legal requirement for any dancers who are state employees to be insured by the **"Stage Insurance"**, the provisionary institution of the German Theaters. The stage insurance offers something special for dancers, the dancer's compensation. Every dancer employed in state theaters can have this sum paid out to them after they reach the age of 40, the amount includes the dues one has paid plus the share from the employer plus the yearly interest accrued. This makes the switch into another profession easier and helps you to establish yourself in a new profession. But you can also voluntarily continue paying dues and thus earn an additional pension.

Full time employed dancers are automatically members of a **mandatory accidental disability insurance**. The fees for this are paid by the theater. The mandatory accident insurance serves the dancer in many ways. This insurance covers prevention, pays for rehabilitation after a workplace injury, and goes so far as to pay compensation (in the form of a monetary payment or a pension). Workplace accidents are covered, as are accidents on the way to or from the theater for work, as well as professional diseases.

The exceptions

Exceptions verify the rules. And there are lots of exceptions in the realm of dance. The number of dancers who are so lucky as to have full time employment is continually shrinking. Free-lance dancers must take care of their insurance on their own.

Non-continual employment

In the dance departments of state theaters, guest contracts and project contracts are frequently arranged. For insurance protection purposes this means: the dancer is automatically included in all the areas of the social insurance just like those with permanent employment. Yet the dues for health and stage insurance are higher. The dancer is not insured against unemployment. It is up to each individual to build up enough of a financial basis to provide for the time after the end of the contract.

Self-employed dancers

For self-employed dancers there is an interesting special case: they can be accepted into the Artists' Social Fund (Künstlersozialkasse: KSK). Through that, they have the same benefits as full time employed dancers. The part of the dues for the retirement, health and geriatric care insurance, paid by the employers of full time dancers, is paid for by the KSK. Thus, the amount you pay on your own is considerably less. However, it can sometimes be difficult to get into the KSK. Therefore, you should discuss the precise criteria for acceptance in advance with a specialist. Frequent changing from full time employee status to self-employed status is often complicated, so that the advantages in each particular case should be considered individually.

A voluntary membership in the employees' mandatory accident insurance is recommended. Joining does not cause any problems. For a small fee you receive the same benefits as the full time employed dancers have.

The Career Afterwards

Professional dance is integrally associated with youth and health. The career as a dancer is short and is being continually made even shorter through higher demands. The transition into another career often happens already in the early thirties, thus at an age when other people are just developing in their professions. There are various reasons for this:

- Extreme competition through younger dancers;
- Increasing difficulty to maintain the high level of performance;
- A late change makes the choice of new professions more difficult and limits the possibilities for retraining.

What you should know



The wish to remain within the realm of dance is not something every dancer can achieve. Varied interests help you to find a suitable field of endeavor whether within or outside of the dance world. Changing careers several times in the course of a lifetime is no longer unusual. In many areas it is even desired. This offers the dancers new opportunities.



The power of dance

Dancers develop abilities and qualities which are advantageous and desired in many professions. They are accustomed to working in a concentrated manner, with discipline, and they pursue their tasks with perseverance. They learn to follow instructions, to convert ideas into reality, to accept criticism and to deal positively with it. They feel part of a team and take on responsibility both for themselves and the team.

What can happen

Loss of identity: One of the worst things for dancers is to lose their identity as dancers. Respect and admiration are missing as well as the performances and the applause. The life-style they have been living for many years, the working situation they know and the unusual daily schedule are all left behind for something new and unknown. It is not surprising that this results in fears.

Sorrow: Leaving the stage is usually associated with sadness. Perhaps some people never achieved the goals they had set for themselves. The duration of the career can have been too short for that. It is a natural and important process to go through sorrow in this situation. Yet before the sadness comes the anger. Only when that has been dealt with can the work of mourning follow, so you can consciously conclude your active dance career.

Financial Difficulties: With the end of the dance career the departing dancers often lose the minimal financial security they once had. Now they see themselves confronted with acute financial emergencies. Only very few can rely upon their savings in this situation. The search for a new source of income becomes urgent.

Do not be afraid of the working world outside of the theater. Be aware of your advantages and positive qualities. What do you like most? What do you do well? What capacities do you have naturally?

What you can do

Think early on about a second career possibility. Seek contact with former dancers who have already found their ways into the "careers afterwards". How did they master their situations? What good, what bad experiences did they have? Information and conversations with older colleagues can help you to find your own further professional pathway.

Do not be afraid to look for professional psychological help if necessary. The conscious departure from the career as a dancer is associated with many fears and insecurities, and they often reach deep into the personality. Professional psychological advice can be a big help for this problem. It is certainly not a sign of weakness!

Use the support of different organizations. The Central Stage Mediation (Zentral Bühnen Vermittlung -ZBF) in Cologne can inform you, among other things, about possibilities for financial support during retraining programs. Even your local unemployment office (Arbeitsamt) has lots of information for you. The Union of German Stage Affiliation (Genossenschaft Deutscher Bühnen Angehöriger - GDBA) offers individual counseling for members. The Stage Insurance of the Bavarian Board of Insurance (Bayerischen Versicherungskammer) supports their clients through the payment of the so-called dancer's settlement. Note: for this there are certain time limits with fixed dates.

Also on the international level there are places to find assistance as a dancer looking for a new orientation. Great Britain, France, Holland, Canada and the USA offer services for dancers to prepare and support their further professional activities.

Through the selection of subjects, this brochure gives you an overview of the problems and risks of the career as a dancer. At the same time you should be encouraged to develop your own interest in these sometimes uncomfortable but still important subjects and if necessary, to look for professional help. Tips and complementary information are gladly welcome.

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Further literature: contact the author

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Further addresses of doctors and therapists can be found in the internet in the therapists list of TaMeD, TanzMedizin Deutschland e.V. under **www.tamed.de**.

Dr. med Liane Simmel is a former professional dancer and has been working for years as a doctor in dance medicine. She is a founding member of TaMeD, TanzMedizin Deutschland e. V., the German health organization for dancers. As director of the Institute for Dance Medicine "Fit for Dance", she is specialized in the prevention and therapy of dance injuries. She treats numerous dancers and dance students in her practice in Munich.



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