

# Dr. Beach ergonomic concept

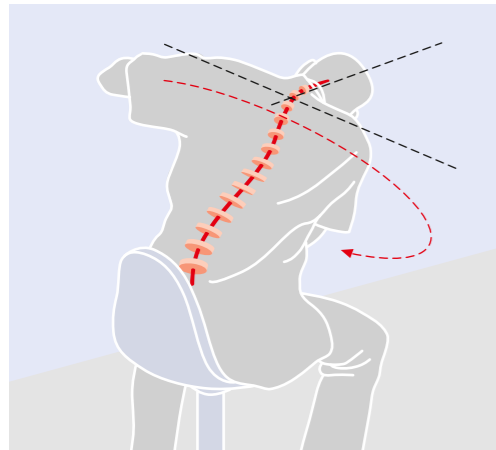
Protects your back and  
frees you from back pain



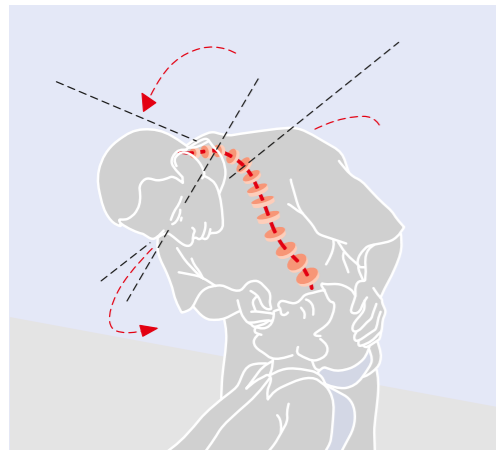
Thinking ahead. Focused on life.

# Relieve your back: with a natural and ergonomic working posture

After treating patients all day, do you often feel exhausted, suffer from a headache and/or backache and find that you cannot really enjoy your well-earned leisure time? With the aid of the Dr. Daryl Beach ergonomic treatment concept you could soon reduce the stress on your body to a minimum and live and work free of pain.



Back problems are inevitable if this unnatural posture is maintained for a long time



This bent posture also places too much strain on the back and causes premature wear and tear

## Dr. Beach ergonomic concept

Hardly any other occupational group practises its profession in such a one-sided, unnatural posture as dentists, who have to maintain this posture for many hours at a time. The result is that about 64 % complain of backache and 42 % of posture-related headaches\*.

These physical stresses could be avoided by using the Dr. Beach concept, also sometimes known as the "12-hour treatment" concept, which has been practised successfully in Japan since the 1950s. This concept is based primarily on a natural, stable posture in which only the forearms are active. Dr. Beach had observed this posture with test subjects, who were asked to carry out "blind" a controlled sensomotoric precision task (e.g. peeling an apple) and who all instinctively adopted this natural, stable posture.

With the Dr. Beach ergonomic concept the dentist does not bend – with a twisted back – over the patient. Instead the patient lies relaxed in a specially contoured treatment unit and the patient's head is turned so that it is in the correct position. This allows the dentist to maintain a natural posture.

- Stresses on the dentist caused by an unnatural, incorrect posture and the associated physical wear and tear are reduced to a minimum.
- There is no longer a problem with back pain or headaches.
- Natural, efficient movements during treatment allow the dentist to work more precisely and safely, even in areas difficult to access.
- A balanced, natural posture ensures maximum concentration and precision.
- Smooth movements by the dentist promote a more relaxed, stress-free atmosphere.

\* According to a study by the Freier Verband Deutscher Zahnärzte (Free Association of German Dentists)



The dentist's kinaesthesia and sense of touch are indispensable in ensuring precise preparation with instruments

## Interaction of five senses for optimum treatment

Consideration should be given to the five senses of balance, kinaesthesia, touch, hearing and sight to ensure optimum dental treatment. It is therefore important to cater for all these senses when designing an ergonomic treatment area.

## Determining the initial reference point

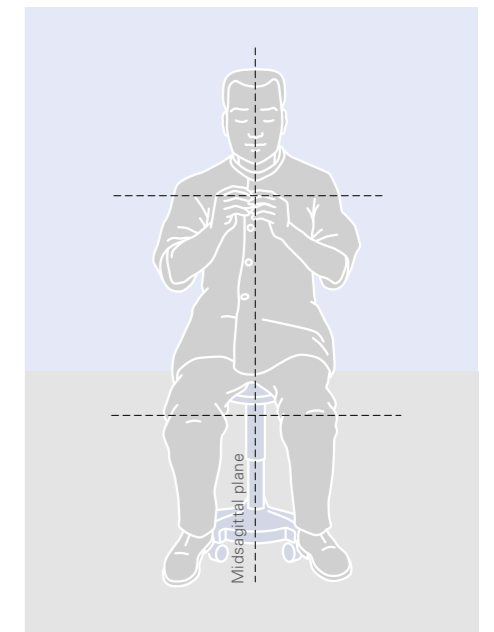
The Dr. Beach concept focuses on determining the initial reference point, i.e. the treatment point from which the dentist can move smoothly in three directions during treatment (forward – back, right – left and up – down). Once this point is determined, the dentist can incorporate kinaesthesia in the dental treatment and in this way control movement of the fingers.

## Where is the initial reference point?

It is in the median sagittal plane of the dentist, level with the heart and at a width of two fists from the body.

## Controlled movements at the treatment point

The correct finger position as well as control by a sense of touch and kinaesthesia ensure that the dentist can reproduce the mental image of the preparation using a precise, controlled technique with the rotary instrument and intuitively knows how and where the tip of the instrument should be positioned and moved and how much force should be applied.



Finger movements can be optimally controlled when the fingers are in the median sagittal plane, holding the handpiece with the palm half pointing downwards and inclined to the left

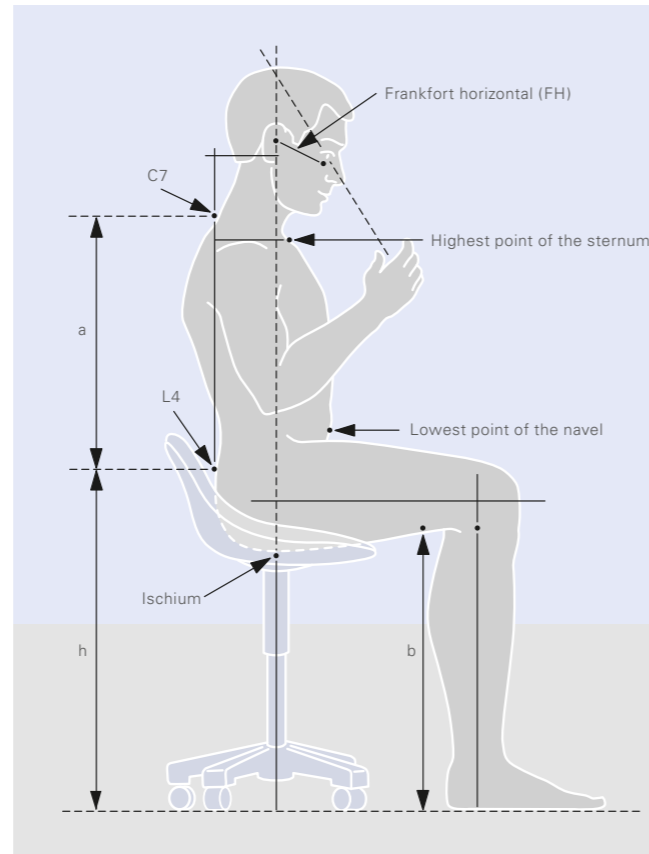
# How to find the correct working posture

## Determining the reference posture

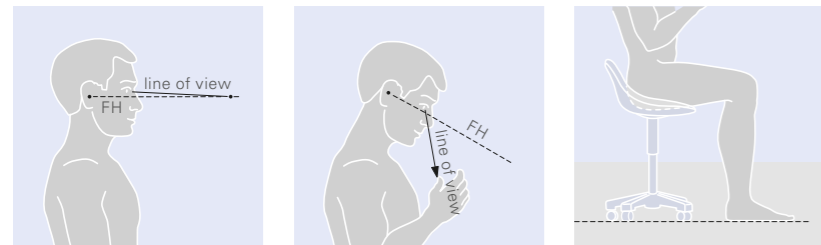
An optimum posture of the whole body is a prerequisite for working without harming the body. In this respect, Dr. Beach refers to an instinctive, natural and balanced working posture or reference posture.

He refers to it as instinctive because everyone subconsciously adopts this posture automatically when carrying out precision work. It is natural because the prerequisites for this posture are determined physiologically and anatomically (skeletal structure, muscle tonus). The posture is balanced because the forces of gravity are in stable equilibrium.

- Seated posture, seating height at knee height
- The feet are flat on the floor, the lower legs are in a vertical position, the thighs are slightly inclined and form an angle of approx. 30°.
- The longitudinal axis of the torso is upright.
- The upper arms and elbows hang relaxed due to the force of gravity, the elbows do not stick out and the forearm is in front of the body.
- The fingertips are at the treatment point in the median sagittal plane, level with the heart.
- The head is inclined forward slightly and the interpupillary line is aligned horizontally.



The torso remains in a natural upright posture without twisting or bending. The line between C7 (seventh cervical vertebra) and L4 (fourth lumbar vertebra) – see line a in the illustration – is vertical. A line through the navel, which is at right angles to line a, runs parallel to the longitudinal axis of the thigh. This is one of the checkpoints for the “reference posture”



1. When looking straight ahead, the line of view is in the horizontal plane
2. When carrying out precision work, the line of view is approx. 80° below the horizontal plane
3. The thighs are slightly inclined and the lower legs are in a vertical position

## Natural and balanced movements during treatment

Each part of our body – arms, legs, hands and feet – has a specific, natural sphere of movement, i.e. a sphere in which movements are made in a relaxed, smooth way and above all with minimum force. If you move your forearm for example to the right and left of the elbow – as is frequently necessary during dental treatment – you will quickly notice the natural limits of the sphere of movement.

Cramped movements that place a strain on the body can easily be avoided if your torso has a stable posture. An instinctive, natural posture automatically produces smooth, fatigue-free arm and leg movements, a prerequisite for efficient dental treatment.

## Ergonomic movement of the forearm

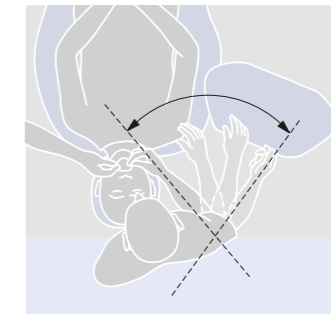
Try to pick up an instrument by only moving the forearm and you will notice that the movement seems very natural and is not at all difficult.

This is the natural movement of the right forearm from the centre of the body to the right. The further the forearm moves to the right, the further it moves downwards. This is why the tray with the instruments and other materials is positioned below the treatment point, i.e. to the side of the headrest of the treatment unit. Only a slight turn to the right is required to pick up the instruments.

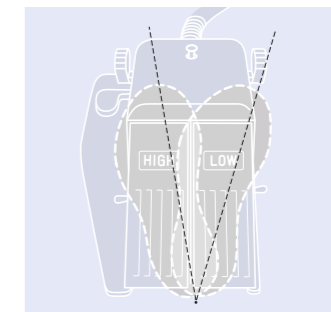
## Natural movement of the feet

The foot control of the treatment unit is positioned so that it can always be operated using natural movements. When operating the foot control, the lower leg is moved out of the vertical position by approx. 30° (= treatment position).

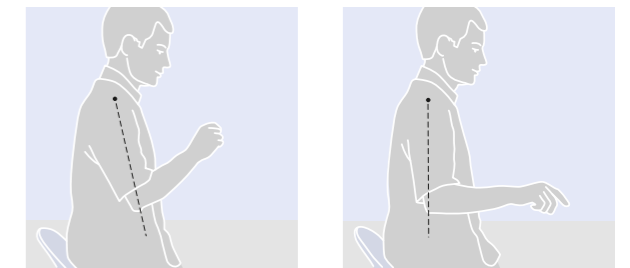
The position of the foot control also takes into account the natural sphere of movement of the toes, which is approx. 20°:5° with upward movements and 15° with downward movements.



The Dr. Beach treatment concept ensures natural movements, relieving strain on the back



The two foot control pedals can be comfortably operated with the ball of one foot without having to raise the foot



The right forearm moves naturally from the centre of the body to the right. The further the forearm moves to the right, the further it moves downwards. Only the forearm is moved in the treatment position



# Ensure you and your patients experience relaxed treatment



The Dr. Beach treatment concept is human centred. It enables the dentist and assistant to adopt a natural working posture – without suffering back pain. The patient lies in a stable, relaxed position in the EMCIA treatment unit, with the instruments that could cause anxiety out of sight

## Spaceline EMCIA treatment unit

The Spaceline EMCIA dental treatment unit from Morita was developed according to the Dr. Beach concept and ideally combines the requirements of the concept for ergonomic treatment.

In order to provide an optimum treatment unit, we focused on a large number of detailed anthropometric measurements (height of patient, body width, weight, leg height, back height).

The result: the Spaceline EMCIA – a treatment unit that is tailored to the human body and ensures that every patient is treated in a comfortable, stable position. The instruments and handpieces as well as the control panel of the Spaceline EMCIA are arranged according to the natural sequence of movements so that the dentist and assistant can carry out virtually all procedures by simply swivelling from one direction to the other.

## Five essential movements for maintaining a stable reference posture

The position of the dentist or patient has to be adjusted slightly according to requirements so that a stable reference posture can be maintained regardless of the type of treatment.

### Change of position by the dentist

The dentist turns as required clockwise between 10 o'clock and 12.30 o'clock. It is important when doing this that the elbows are not raised and upper arms and forearms hang relaxed.

### Turning the patient's head to the right and left

Turning the patient's head to the right and left facilitates working in areas difficult to access and ensures an optimum line of view.

### Adjusting the angle of the maxillary occlusal plane

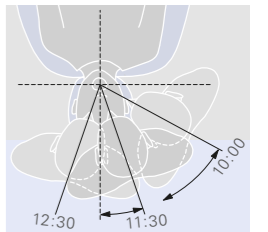
The angle of the maxillary occlusal plane can also be adjusted during treatment by simply sliding the head support up or down with the left hand.

### Adjusting the degree of mouth opening

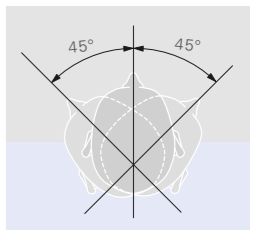
Depending on the type of treatment, the patient's mouth is opened between one and three fingers wide. The patient's mouth only has to be opened the width of one finger for work on the buccal surface of the posterior teeth.

### Adjusting the height of the patient

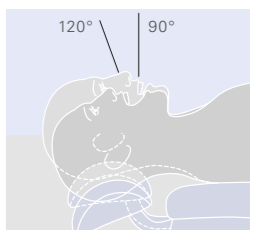
The patient is raised to a higher position using the foot control for work that requires a very high degree of precision. Operations such as extractions on the other hand are carried out in a lower position, as in this position the application of force is most effective.



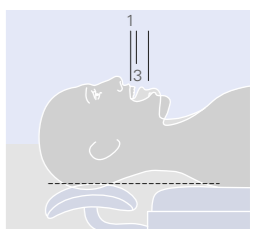
Change of position by the dentist



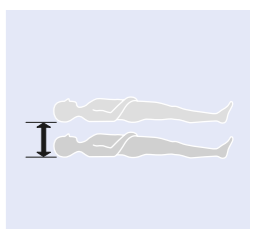
Turning the head to the right and left



Adjusting the angle of the maxillary occlusal plane

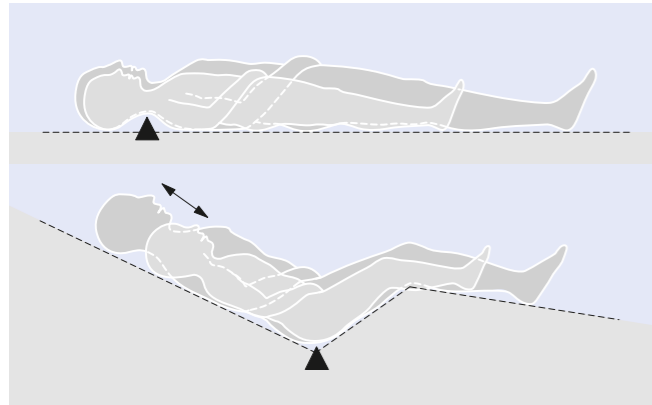


Adjusting the degree of mouth opening



Adjusting the height of the patient

# How to find the optimum treatment unit



This ergonomically designed treatment chair ensures that all patients – whether a small child or a “giant” – lie in a stable, safe and comfortable position

## Length and contour of the treatment chair

The relationship to the seventh cervical vertebra is used as a reference point when determining the ideal length of the chair. This vertebra is also used as a reference point when positioning the patient on the chair to determine the contour lines. As the chair has a fixed horizontal lying area, the position of the patient’s mouth remains at the same level for the dentist even when the height of the chair is altered.

The horizontal position of the patient is also a very comfortable working position for the dentist and contributes greatly to a relaxed treatment. Even after lengthy treatment, the patient leaves the treatment chair without any signs of fatigue.

## Stable position for all patients

The development of a treatment unit according to Dr. Beach is based on correct measurement of the body weight of people of different sizes as well as the relationship between different positions to ensure that all patients lie in a stable, comfortable position during dental treatment and do not slide back and forward. The measurements of the unit are therefore determined for example using the reference width from shoulder to shoulder, which is 490 mm, and from elbow to elbow, which is 670 mm.

The patient’s stable position on the comfortable chair is enhanced by cushioning in the support areas and also in areas the patient comes into contact with when lying down and getting up.



The handpieces are within the natural sphere of movement of the hand so they can be picked up without bending the elbow

## Headrest

The headrest supports the head of the patient naturally, even when increased force is applied.

The headrest should be as slimline as possible and should not have any projecting parts, e.g. grips on the underside. The dentist would instinctively try to avoid these “projections” and automatically change the natural treatment position.

It is important that the headrest is large enough so that the patient’s head rests comfortably when the patient is in the supine position. It should also be designed to allow the head to turn 45 degrees to the right and left, i.e. a total of 90°.



The headrest is large enough to ensure the patient’s head automatically rests in the middle



The headrest also enables the maxillary plane to be inclined vertically from 80° to 110°



The two pedals and lever of the foot control are positioned so that they correspond with the natural movement of the toes and take into account the frequency of use

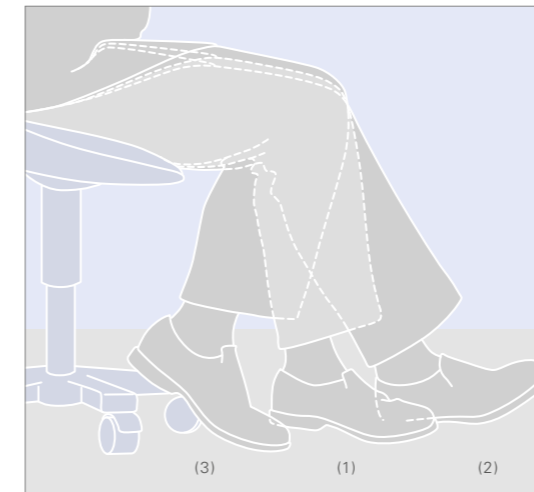
## Position of the handpieces

Have you ever asked yourself how often you pick up a handpiece during a working day? If the handpiece is in an unergonomic position, it involves numerous unnecessary movements, which are also extremely unnatural and place a strain on the body. The result is that by evening your back aches and treatment is less efficient.

With the Dr. Beach concept the handpieces are positioned on the back of the chair below the headrest; they are next to the tray and therefore in the natural sphere of movement of the arm. The handpieces can be easily brought into the optimal sphere of movement from this position – without stretching the arm or turning the torso. Another advantage is the additional space provided by the comparatively short handpiece cable.



The working stool must be at the correct height to ensure that the muscles are not unduly stressed and long periods of sitting will not cause any strain



Position of the lower legs in the reference posture (1), in the working posture (2) and in the rest position (3)

## Foot control

The foot control is fitted so that it is in the natural sphere of movement of the feet, even when the dentist changes position.

The foot control regulates important functions such as the rpm of the handpiece, water flow and the height of the treatment unit. The foot control of the Spaceline EMCIA treatment unit can also be used to control the operation light.

## Optimum seating

In order to maintain a natural reference posture during all procedures, the dentist should be able to move freely around the patient’s head as required. The ideal working stool is a swivel chair with five functions. It should not have armrests, as they would interfere with natural movements.



# Tips for an optimally designed treatment area



Ergonomics and design are perfectly combined in this practice. Optimised procedures and increased free space with the Spaceline EMCIA treatment unit ensure a relaxed environment

## Ideal practice layout

Planning or redesigning a practice should be human centred, i.e. focus should be on the patient, assistant and dentist. This includes ensuring that personnel in the treatment area have optimum working conditions.

The aim of professional planning is to have everything close at hand and provide adequate free space for the dentist and assistant so that they can work without obstructing one another as well as to ensure that the dentist maintains a natural posture during treatment. Successfully achieving this aim creates a human-centred practice.



The position of the tray, which is not in direct view of the patient, greatly contributes to a relaxed atmosphere



In an ergonomically designed practice movements are made smoothly and efficiently

## Actions and movements of the dentist and assistant

The daily routine of the assistant also involves many different, repeated movements – including preparing instruments, assisting treatment as well as washing, sterilising and storing instruments. Ideally it should be possible to carry out these tasks in the same room using a minimum of natural movements.

The closer at hand everything is to the dentist and assistant and the less interference there is to their natural movements, the more efficient and high-quality the treatment will be.

## Actions and movements of the patient

When planning a treatment room, it is also important to ensure that it is easy for the patient to get onto the chair. The patient should also not feel restricted during treatment or when getting off the chair and leaving the treatment room. This is why, for example, the handpieces are positioned on the back of the chair to avoid the problem of cables hanging in front of the patient's face.

## More well-being in just 1½ days

Our various regional courses offer you the possibility of learning the ergonomic treatment concept developed by Dr. Daryl Beach. Practice-oriented, personal and efficient: In small groups with a maximum of four participants and under the guidance of renowned dentists you will learn how to prevent typical complaints easily and effectively. After just 1½ days, you will be surprised how quickly you have got used to working in an upright position – a position which has a positive effect on your neck, your performance capability and your workflow.

Details of course dates can be found at our website under [www.morita.com/europe](http://www.morita.com/europe) or by simply asking your local dealer.

## Coordination of the actions and movements of the dentist, assistant and patient

Professional planning takes into account the spatial as well as chronological aspects of the individual actions of all involved, automatically eliminating the possibility of people getting in each other's way. Mobile trays that could hinder the patient entering or leaving the treatment room should also be avoided by appropriate planning.

The abovementioned advantages will certainly encourage more and more dentists to adopt the Dr. Beach treatment concept in future. They will be rewarded with a relaxed, efficient treatment posture, a healthy back as well as satisfied employees and patients.

It only takes a few hours to learn how to modify treatment to the Dr. Beach concept. Many practitioners regret that they did not adopt the concept earlier. They could have been free of back pain a lot sooner!

We would be happy to answer any questions about the "12-hour treatment" concept or about our Spaceline EMCIA treatment unit. Just contact us!



Professional planning ensures free space for all involved in the treatment

Diagnostic and Imaging Equipment

Treatment Units

Handpieces and Instruments

Endodontic Systems

Laser Equipment

Laboratory Devices



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