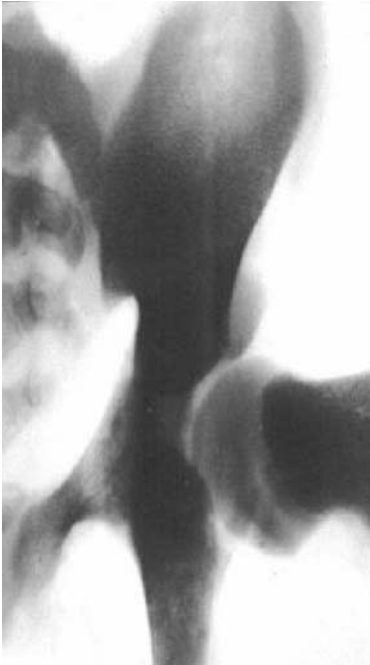


## 14 Principles of Ultrasound-Based Management



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### 14.1 Basic Biomechanical Aspects Behind the Principles of Treatment

The value of hip ultrasound is measured by the rate of, and success of, treatment. Inexact diagnoses, e.g. “dislocation” or “subluxation”, or the general term “dysplastic hip” inadequately describe the patho-anatomical condition of the hip joint.

This can be illustrated by a simple example: “fever” is not a diagnosis. Nobody would treat a febrile child with broad-spectrum antibiotics without making a diagnosis. It can be done, but the success of treatment will be small and the damage probably large. The best possible treatment for a hip disorder (traction, splints, etc.) can only be selected with an accurate diagnosis. Just as an antibiotic will be chosen once the sensitivities are known, so the hip must be clearly seen (by sonography) and the diagnosis made (classification by type).

The basis for any treatment must therefore be an analysis of the patho-anatomical appearances of the hip joint. If the diagnosis is accurate then the success of a specified treatment can be determined. Advantage can be taken of the age-related growth potential, whilst the treatment can take into consideration the biomechanics. Treatment used to be based on clinical or radiological findings; however, ultrasound-based management is decided after determining the patho-anatomical situation of the bony and cartilage socket. If tried and tested principles of treatment are followed, correlated with the ultrasound findings, the treatment should be adequate.

Starting treatment without using an imaging method that can visualize the hip joint is obsolete. Even in the treatment of hip maturation disorders, “do no harm” should be the guiding principle. Over-treatment not only has the potential to harm the joint but is also a handicap for the child, a great emotional burden for the parents, and a financial burden for the general public. “Preventative treatment” is just as obsolete as

treatment with antibiotics without a diagnosis. The optimum combination of diagnosis and treatment requires a great deal of organizational effort and calls for cooperation between paediatricians and orthopaedic surgeons.

Important formula:

**Result = Diagnosis + Treatment**

Hip ultrasound is only responsible for the diagnosis and has no influence on the final result if the treatment is inappropriate.

### 14.2 Goals of Treatment

1. To reverse the patho-anatomical deformity of the joint back to the normal status for the age.
2. To make full use of the ossification potential of the hip joint.
3. We know today that the growth and ossification potential of the hip joint are age related. Therefore, accurate diagnosis and starting necessary treatment as soon after birth as possible is recommended.
4. To avoid damage, especially to the growth zones in the hip socket as well as avoiding necrosis of the femoral head.

### 14.3 Stages of Treatment

The first step must always be the analysis of the patho-anatomical state of the hip joint.

Sonographic typing defines the patho-biomechanical state of the joint. As the femoral head “slides out”, mechanical deformity of the socket results. Treatment must therefore be chosen which is able to reverse the forces in the hip joint in such a way that the deformity can revert to the normal status for the age. The worst-case (decentred) hip joint needs an initial stage of preparation and three stages of treatment.