In this thesis guidelines are established for a service in developmental pathology that can further enhance the different aspects of developmental medicine.

Such a service is primarily dependent on the routine use of a comprehensive developmental postmortem protocol for the examination of embryonic and perinatal deaths. Therefore the most important parts of the developmental postmortem, including routine postmortem radiography, assessment of maturation and growth as well as developmental neuropathology, are discussed with an emphasis on the methodology. The more relevant information for the performance of a developmental assessment of embryonic and perinatal cases is provided in the Appendix. Special stress is laid upon the evaluation of maturation and growth since many forms of fetal and neonatal pathology are closely related to the developmental stage of the individual case.

A methodological approach as proposed here represents the basis for an analysis of the causes of perinatal morbidity and mortality. This is necessary to identify those factors that might be influenced by changes in clinical management in order to achieve an improvement in perinatal care. In this context the causes of perinatal deaths in a Dutch series were surveyed by means of the outlined developmental postmortem protocol. Furthermore a model for a perinatal audit is presented together with the results obtained from its application to the study of two Scandinavian populations. The results of the Norwegian perinatal audit indicate that nearly one-third of the perinatal deaths might be avoided without any great injection of new resources in terms of personnel and equipment. It is therefore suggested that regional perinatal audits are established in order to inquire into possible avoidable factors that will help to further reduce both perinatal morbidity and mortality.

Recent developments around antenatal diagnosis and surveillance as well as emerging therapeutical possibilities in utero have resulted in an increasing need for a detailed morphological examination of embryonic and fetal deaths. The postmortem findings reported in this thesis further underline the importance of a routine examination of the different types of early pregnancy loss. Moreover it demonstrates that hypoxic-ischaemia must be considered as an equally important factor.
together with anomalies, chromosomal abnormalities and genetic disease in the evaluation of the pathology of early pregnancy.
These results indicate that an optimal antenatal diagnosis and surveillance depends on a close collaboration between clinicians and pathologists.

The introduction of modern ultrasound allows for the assessment of both fetal/neonatal anatomy as well as function (e.g. fetal movements, fetal-placental haemodynamics). Therefore the interpretation of the morphological findings at postmortem in relationship with the functional status during life is what one has here defined as functional morphology. This is well illustrated by the comparison between fetal movement patterns and morphological findings in the study of abnormal motor behaviour in anencephalic. Our results obtained from correlating postmortem anatomical and sonographic findings in brains of newborns with haemorrhagic and/or ischaemic pathology further underline the advantages of such an approach.

Special attention is given to the placenta because the morphological examination of this fetal organ is very much part of a developmental assessment. The placenta pathology in insulin-dependent diabetic patients treated with continuous subcutaneous insulin infusion (CSII) emphasizes the role of the placenta in the understanding of pregnancy associated pathology. In addition it also demonstrates that deviations in the developmental stage of the placenta can represent an important source of pathology as is the case for a number of fetal and neonatal conditions.

Furthermore this study demonstrates that a tight glycaemic control achieved with CSII does not affect the morphological expression of diabetes in pregnancy.

Our results with the use of the pregnant Wistar rat indicate that this is a useful experimental animal model for the study of the pathology of uteroplacental circulation in haemochorial placentation. Therefore this model can be used to evaluate fetal growth retardation. For this purpose the radiographic assessment of fetal growth as presented here represents a simple and reliable method that also allows for the detection of eventual skeletal anomalies.

On the basis of our findings with this animal model we propose that early growth delay seen in diabetes is the result of an abnormal
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The absence of malformations among the treated diabetic rats (streptozotocin insulin pump) in our experimental model suggests that the teratogenic effect of diabetes is not only dependent on a time in gestation but also on a prolonged and substantial disturbance of the glucose blood level.