

The developmental origins of adult health and disease

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The 'fetal' or 'early' origins of adult disease hypothesis was originally put forward by David Barker and his colleagues and stated that environmental factors, particularly nutrition, act in early life to program the risks for adverse health outcomes in adult life. This hypothesis has been supported by a world wide series of epidemiological studies which have provided evidence for the association between the perturbation of the early nutritional environment and the major risk factors (hypertension, insulin resistance and obesity) for cardiovascular disease, diabetes and the metabolic syndrome in adult life. It is also clear from experimental studies that a range of molecular, cellular, metabolic, neuroendocrine and physiological adaptations to changes in the early nutritional environment result in a permanent alteration of the developmental pattern of cellular proliferation and differentiation in key tissue and organ systems which result in pathological consequences in adult life. Experimental studies have investigated the critical windows during which perturbations of the intrauterine environment have major effects, the nature of the epigenetic, structural and functional adaptive responses which result in a permanent programming of cardiovascular and metabolic function and the role of the interaction between the pre and postnatal environment in determining final health outcomes.