Early Life Nutrition

Maternal and Paternal nutrition prior to contreception and their previous health, can have a large impact on their pregnancy and the wellbeing of their child. A womans health before conception can effect the pregnancy outcomes and the childs long-term health. Obesity and overweight in young women has become an increasing worry, due to rouhgly 60% of men and women between ages 20 and 39 are now either overweight or obese. Women who are obese or overweight before pregnancy, significantly increase the risk of gestational diabetes when they become pregnant, which can in-turn increase the risk of the offspring also developing diabetes and being overweight. This can effect the offsprings long-term health as high birth weights have been associated with obesity, increased risk of heart disease and stroke in later years. Although the maternal nutrition and health are one of the main priorities and consideration in pregnancy preparation, the paternal BMI (Body Mass Index) is also associated with health problems. These include impaired embryo and foetal development, reduced pregnancy rates and pregnancy loss. However, study shows that males that are exposed to famine and undernutrition can increase the risk of their offspring having a higher BMI. An article “Early Life Nutrition” published in 2016 by P. W. S. Davies says that “The associations between paternal nutrition and health outcomes in the offspring appear to reflect epigenetic changes in the sperm that develop in response to nutrition” explaining that the impact of the fathers nutrition is implemented through the sperm during fertilization. Therefore it is important that both parents are cautious of their nutrition and health and make sure they are healthy prior to conception.

The second stage of life where nutrition is a critical factor in a childs health, is during pregnancy, where the foetus physically begins to develop. This is when the mother needs to be most strict, as undernutrition and overnutrition both have negative impacts on the foetus. The importance of maternal undernutrition was proven through “The Dutch Famine” where during 1944 – 1945, people were faced with a significant food shortage where they were forced to decrease their daily food intake. This was shown to greatly impact the offspring of the women who were currently pregnant during this disaster. The undernurtrition caused an increase risk of heart disease, type 2 diabetes, renal dysfunction and obesity 40 – 50 years later in the childs life. These long-term health conditions are developed and caused by the conditioning of the foetus in the womb. When the maternal figure is faced with “calorie restriction” so is the foetus, therefore it learns and adapts to find every calorie possible. If the child is then born into a life where food is easily accessible, they are susceptible to over eating due to their “hunger / satiety set points” being altered during development to expect less food. This most commonly happens via epigenetic mechanisms. As well undernutrition, overnutrition has similar negative effects. Evidence shows that mothers who are overweight or obese are significantly more likely to have overweight children as BMI is shown to being a strong indicator of their childrens risk of disease in later life. Maternal obesity during pregnancy can severely impact a womans fertility and affects the health of the human oocyte (a womens egg). It can alter their hormone levels causing anovulation which stops a woman ovulating, an increased conception time even after assistance for example IVF (Invitro fertilisation) and increased risk of miscarriages. Furthermore, obesity throughout pregnancy can also increase risks of pregnancy complication for the mother such as an emergency caesarean. The neoate is also effected, by increasing chances of a premature birth which can have impact on the brain and physical development risking fetal abnormalities and macrosomia where the baby is overweight. It is recommended

that women before conception ensure they're at a healthy body weight that they can be maintained throughout to decrease the risk of exposing their offspring to health problems.

There is a clear association between the nutrition in the first few years of a childs life and the impact it has on the developing immune system and metabolic programming. Nutrition plays an important role as the immune system is highly sensitive and is easily modified. Past years and research has shown a change in immune diseases, especially in the form of allergies. Allergic diseases generally develop in the first few months of life and can be influenced by a variety of factors such as maternal nutrition, microbial burden and pollutants such as second hand cigarette smoke. Allergies can also be genetic and passed down into the offspring. The risk is higher from the mother as allergies can alter your immune interaction with the foetus during pregnancy, therefore potentially altering the foetal immune response risking allergies in later life. Outside of maternal nutrition and external life factors, there are many nutrients such as antioxidants and long chain polyunsaturated fatty acids (LCPUFA) that are shown to be beneficial for metabolic programming and cardiovascular risks. Adjusting diet and introducing a higher intake of antioxidant foods such as fresh fruit and vegetables, may reduce the risk of asthma and / or eczema. LCPUFA have "multisystem anti-inflammatory" benefits in relation to the immune system and metabolic outcomes. Studies show that fish oil supplements have a beneficial chemical agent that modifies the immune response where it reduces allergen sensitisation and allergic diseases. Another factor influencing the long term health of a child during their early years of life is their eating patters and behaviours. Programming health and nutrition patters in early years of life is crucial as it is when the baby is developing their food preferences and taste buds. Children are strongly influenced by their parents, so when they observe what their parents eat and drink, they adapt their traits. This can have a large negative impact on the child as it increases the risk of obesity or overweight.