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Fertility Status and Overall Health

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Preface

Infertility is often physiologically or genetically linked with other long term disease states and conditions. In this series entitled, “Fertility Status and Overall Health,” fertility status will be explored as a marker of overall health, focusing on links between fertility and adverse health outcomes. This will be addressed by looking at placentation and pregnancy, genetics and environmental factors, and specific fertility disease states, in women, men and children conceived. Identification of early risk factors such as infertility could lead to better counseling and risk reduction for chronic diseases that manifest later.

In “Abnormal Placentation Associated with Infertility as a Marker of Overall Health”, placentation is used as a “tool” to understand the contribution of the genetics of infertility and epigenetics of fertility treatments that are linked to overall adverse outcomes. Similar processes that occur in placentation defects which are more pronounced in the infertile population and those that contribute to lifelong risk of cardiovascular and metabolic disease, will be addressed, providing keys to understanding how infertility affects overall and long term health.

Genetic origins of conditions leading to infertility may be contributory to long term health complications. Studying conditions that are co-morbid with infertility can provide a picture of the overall health of a population that is younger which may be predictive of age related diseases. This is outlined in “Female Genomics – Infertility and Overall Health”. “How to Map the Genetic Basis for Conditions that are Co-morbid with Male Infertility”, focuses on genomic tools that can be used to identify diseases and traits that are co-morbid with male infertility, including cancer and cardiovascular disease.

Animal models of ovarian health can also provide insight into long term disease. “Ovary as a Biomarker of Health and Longevity: Insights from Genetics”, focuses on genetic applications in humans such as GWAS and animal studies linking overall aging and reproduction at the molecular level to understand overall long term adverse health outcomes.

Genetics is not the only factor contributing to infertility and overall health. In “Environmental Contaminants Affecting Fertility and Somatic Health” the role of

environmental toxicants are addressed, reviewing the most recent data looking at their impact on male and female reproductive health.

Focusing on specific disorders that affect fertility which have associated long term comorbidities are addressed in a few articles. Understanding the etiologies associated with ovarian dysfunction to identify etiologies of female-specific increased risk of CVD are reviewed in, “A Canary in the Coal Mine: Reproductive Health and Cardiovascular Disease in Women.” “Hypothalamic Amenorrhea and the Long-Term Health Consequences” focuses on the menstrual cycle as a reproductive vital sign and provides insight into estrogen deficiency and long term health implications. Endometriosis is commonly associated with infertility, in “The Systemic Effects of Endometriosis,” mechanisms how endometriosis may lead to systemic effects that associate with co-morbidities such as cardiovascular disease, cancers, autoimmune disease, psychiatric conditions and metabolism/body weight are addressed. “PCOS: Long Term Health Consequences”, provides an overview of our current understanding concerning the known morbidities of PCOS, beginning with a review of the different phenotypes of PCOS in determining long-term morbidity, the confounding impact of obesity on health outcomes and the short term consequences.

Infertility in men is also associated with chronic disease. In “Male Infertility and Risk of Non-malignant Chronic Diseases: A Systematic Review of the Epidemiological Evidence”, a systemic review is performed on the epidemiologic evidence looking at male infertility as a precursor for increased risk of diabetes, cardiovascular disease and all-cause mortality.

In addition to other chronic conditions, cancer is also emerging as a chronic condition. In “Fertility Status and Cancer” and “Male Infertility and Risk of Cancer” the impact of female and male infertility on overall risk of this chronic condition are presented.

Finally, in “Perinatal and Childhood Outcomes Associated with Infertility,” a better understanding of the effects of infertility on the offspring and long term health implications are addressed.