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BAYESIAN NETWORKS FOR MANAGING GESTATIONAL DIABETES
A CASE STUDY OF **PAMBAYESIAN** PROJECT

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CHALLENGES FOR GESTATIONAL DIABETES CARE:

- GDM screening adds significant cost and demand to routine antenatal care: More than 12,000 women per year at Barts Health receive screening for GDM. Approximately 1,500 women are diagnosed with GDM annually at Newham and Royal London.

- GDM care is multidisciplinary, high cost, time consuming and creates anxiety for the mother.

- GDM necessitates more frequent clinical visits with a range of clinical disciplines. Each make a large number of decisions regarding the mother's ongoing treatment (further dietary intervention, and use of metformin and insulin).

- In order to reduce perinatal risks, timing of delivery is a decision that should be based on multiple factors in addition to blood glucose and fetal growth.

- Data from the QMUL Clinical Effectiveness Group suggests that only 50% of women receive appropriate postnatal testing for type 2 diabetes, and of those, only 50% follow-up with their primary care provider.
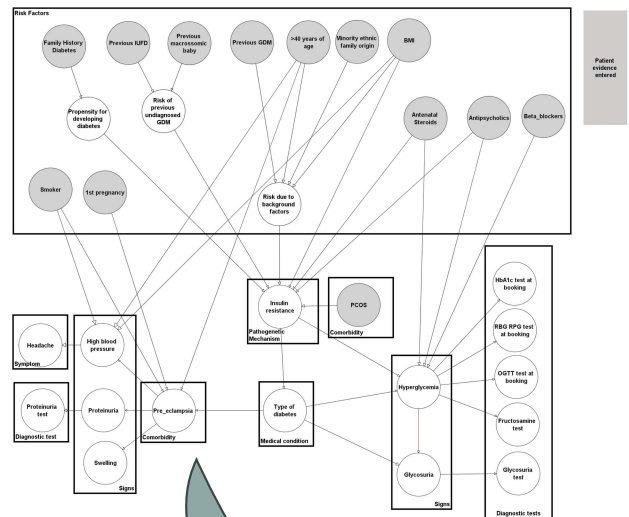

TOWARDS BETTER MANAGEMENT OF GESTATIONAL DIABETES:

- Design Bayesian Networks (BNs) that can offer clinicians and patients a better way to manage GDM. The BNs we develop will form the core of a decision support system that will be designed to provide patients more autonomy in the management of their condition by offering continuous monitoring and reliable advice.

- Our work will assist health service providers to better estimate costs and benefits of any given clinical pathway.

TOOLS:

- Bayesian Networks will be built based on expert knowledge and data.

- Our decision Bayesian Networks and regression models will be evaluated so that we can conduct a cost-effectiveness analysis of our solution.

USE OF BAYESIAN NETWORKS FOR GESTATIONAL DIABETES MANAGEMENT:

- Bayesian Networks can be used to calculate the probability for developing Gestational Diabetes with consideration for the presence or absence of various risk factors.

- If glucose has been found in the urine (Glycosuria), Bayesian Networks may be able to calculate the probability for Gestational Diabetes.

- If a given patient is on insulin treatment, Bayesian Networks may help to calculate her need for medication and risk for adverse outcomes such as macrosomia or neonatal respiratory distress syndrome.
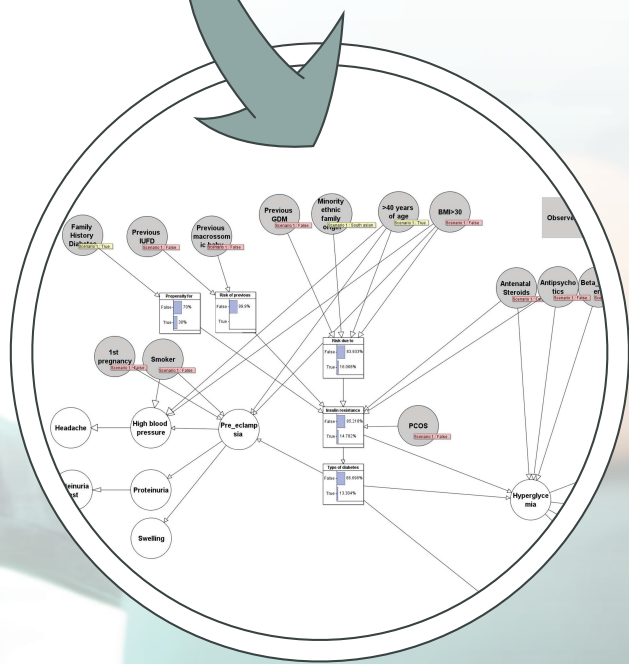
USE OF MODELS TO PERFORM COST-EFFECTIVENESS ANALYSIS:
The model may be used to answer the question:

- What are the costs of each strategy for screening, diagnosis and treatment?

- What are the benefits associated with each treatment strategy?

- Which interventions will maximize her health, with regard for the availability of resources.

1. Farrar, Diane, et al. "The identification and treatment of women with hyperglycaemia in pregnancy: an analysis of individual participant data, systematic reviews, meta-analyses and an economic evaluation." Health Technology Assessment (2016): 1-382.