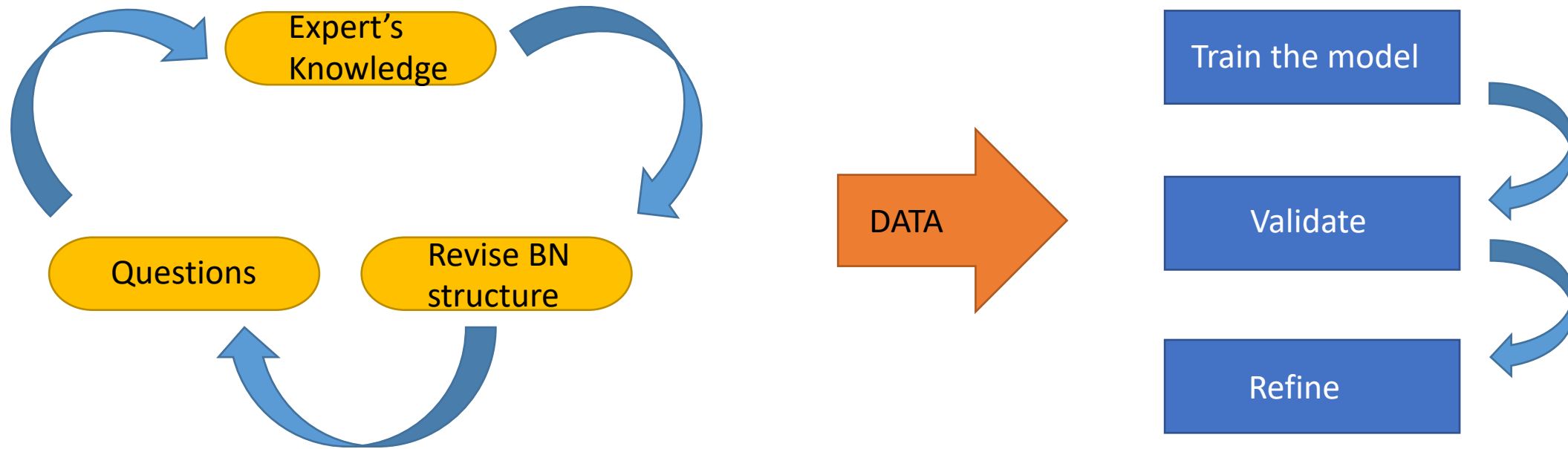# Gestational Diabetes case study

Mariana Raniere

Process of BN development

Decision Points

1. Diagnosis of GDM at screening.

2. Care pathway (community vs. hospital).

3. Initiation and titration of diabetes therapy.

4. Delivery decision.

5. Prediction and management of postpartum type 2 diabetes risk.

Prediction v Decision
- What information?
- Reasoning?

Decision points for Diagnostic of GDM

Diagnostic Decision

Almost everyone screened
- Decide on blood test
- No test, one test, combined test
- Diagnosis following test
  - One or two stages

Diagnostic BN
- Inputs
  - Risk factors
  - Test results
- Predict: GDM
- Use:
  - Initially risk factors only
  - … Then with added test

UML Activity Diagram

Scenario: GDM Diagnostic Decisions

Date: 20 November 2018

Diagnostic Reasoning with a Bayesian Network
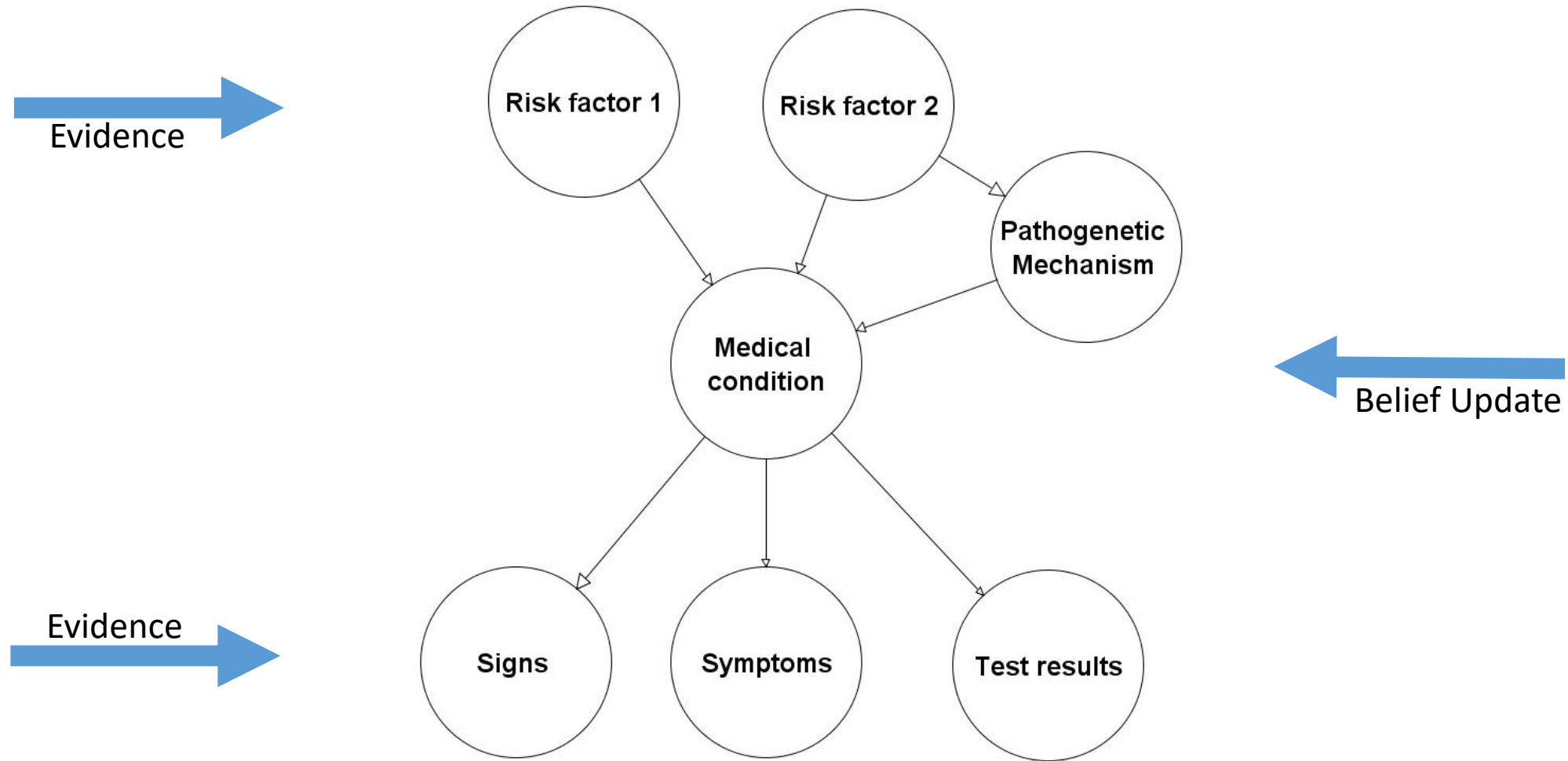
Diagnostic BN

Risk Factors

Test results

Prediction

Diagnostic BN use

Mrs Windsor, 28 years old
(Low Risk Patient)

No PCOS
No previous IUFD
No macrosomic baby
No previous GDM
No FH of diabetes
Normal weight
White
No Antipsychotics
No Antenatal Steroids
No Beta blockers

Diagnostic BN use

Ms Dube, 25 years old
(moderate Risk Patient)

No PCOS
No previous IUFD
No macrosomic baby
No previous GDM
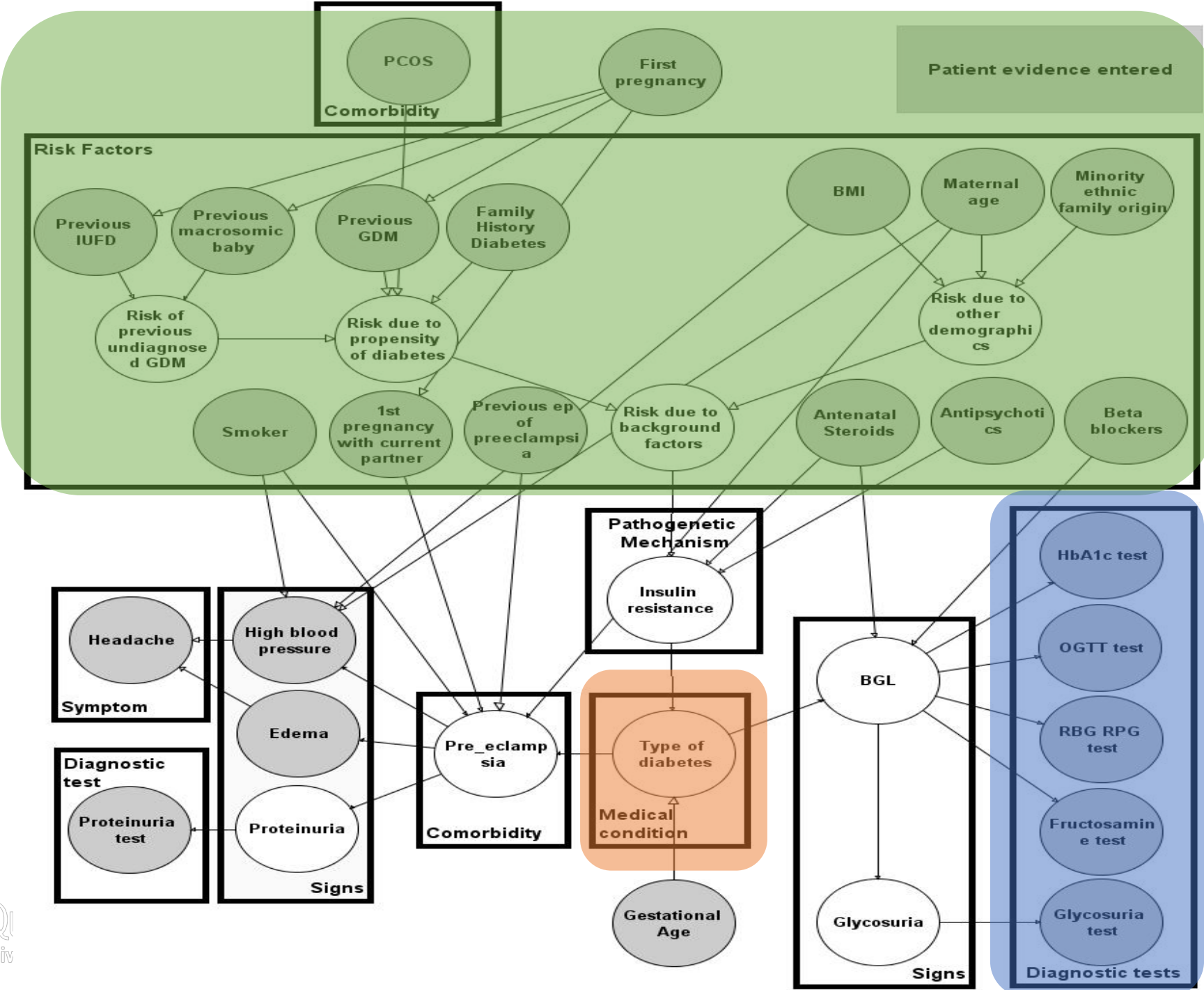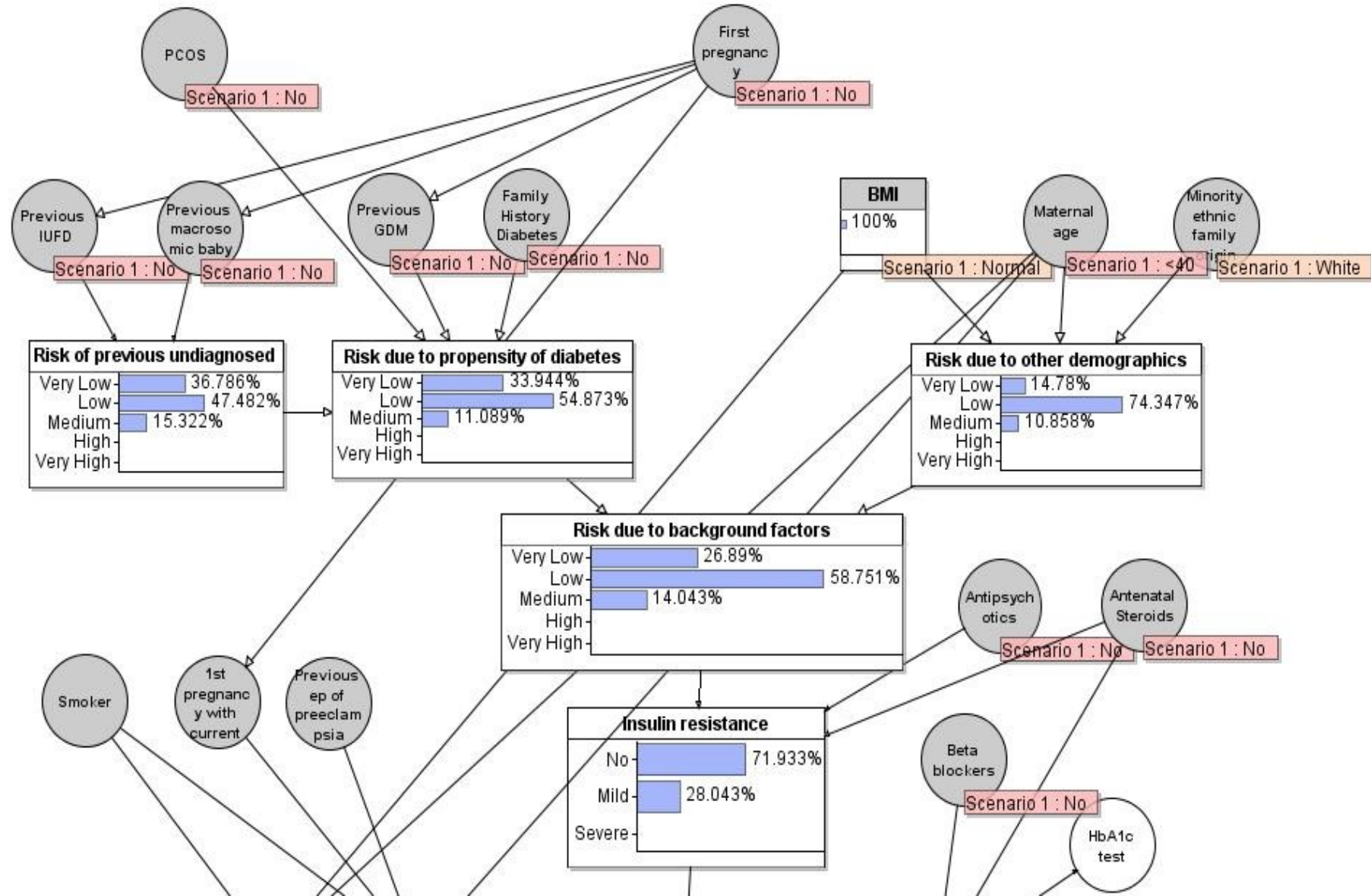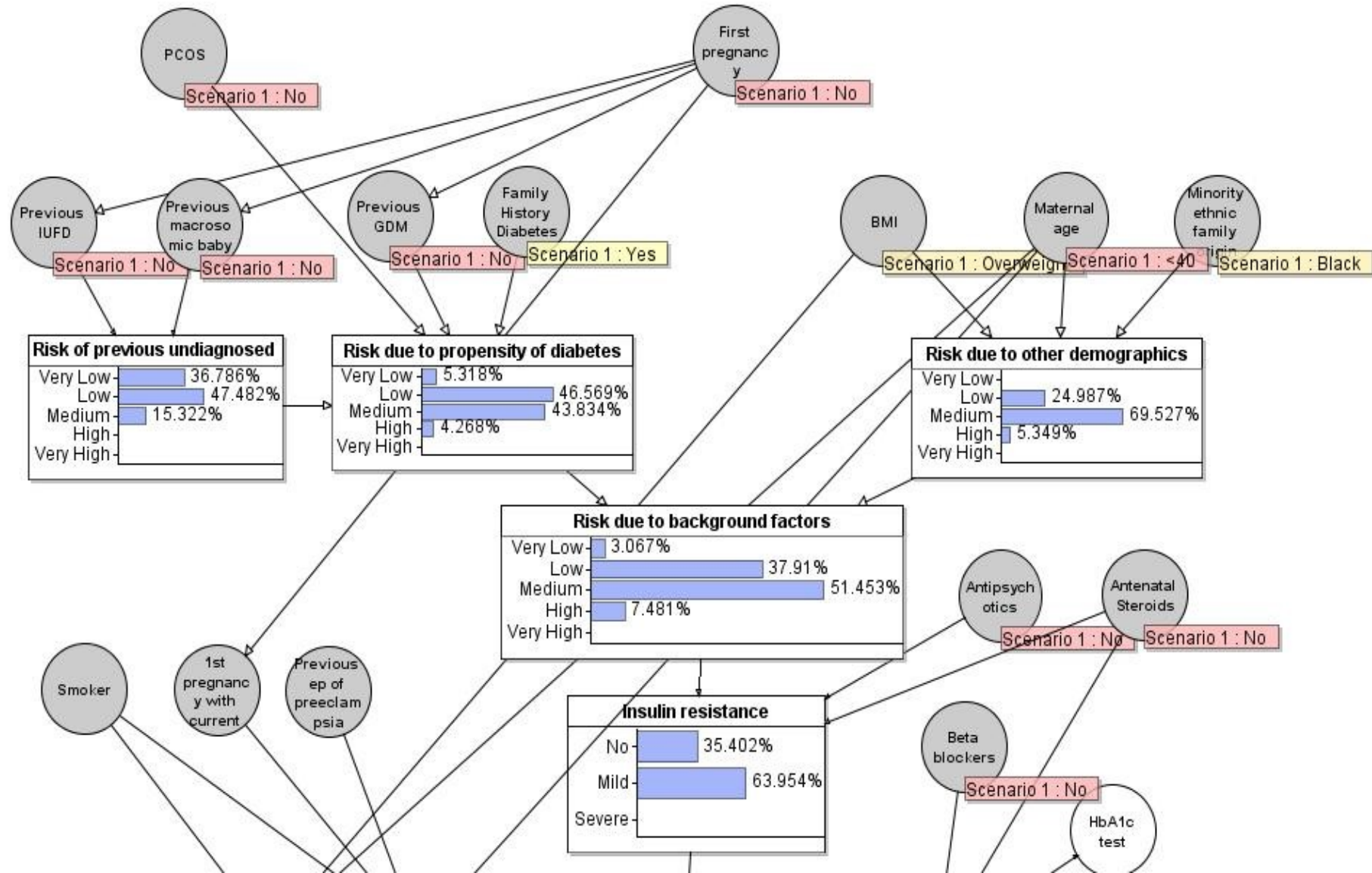**Diabetic mother**
Overweight
Black
No Antipsychotics
No Antenatal Steroids
No Beta blockers

PCOS — Scenario 1 : No

First pregnancy — Scenario 1 : No

Previous IUFD — Scenario 1 : No

Previous macrosomic baby — Scenario 1 : No

Previous GDM — Scenario 1 : No

Family History Diabetes — Scenario 1 : Yes

BMI — Scenario 1 : Overweight

Maternal age — Scenario 1 : <40

Minority ethnic family origin — Scenario 1 : Black

Risk of previous undiagnosed
Very Low	36.786%
Low	47.482%
Medium	15.322%
High	
Very High	

Risk due to propensity of diabetes
Very Low	5.318%
Low	46.569%
Medium	43.834%
High	4.268%
Very High	

Risk due to other demographics
Very Low	
Low	24.987%
Medium	69.527%
High	5.349%
Very High	

Risk due to background factors
Very Low	3.067%
Low	37.91%
Medium	51.453%
High	7.481%
Very High	

Smoker

1st pregnancy with current

Previous ep of preeclampsia

Antipsychotics — Scenario 1 : No

Antenatal Steroids — Scenario 1 : No

Beta blockers — Scenario 1 : No

Insulin resistance
No	35.402%
Mild	63.954%
Severe	

HbA1c test

Diagnostic BN use

Mrs Begum, 28 years old
(High Risk Patient)

No PCOS
No previous IUFD
No macrosomic baby
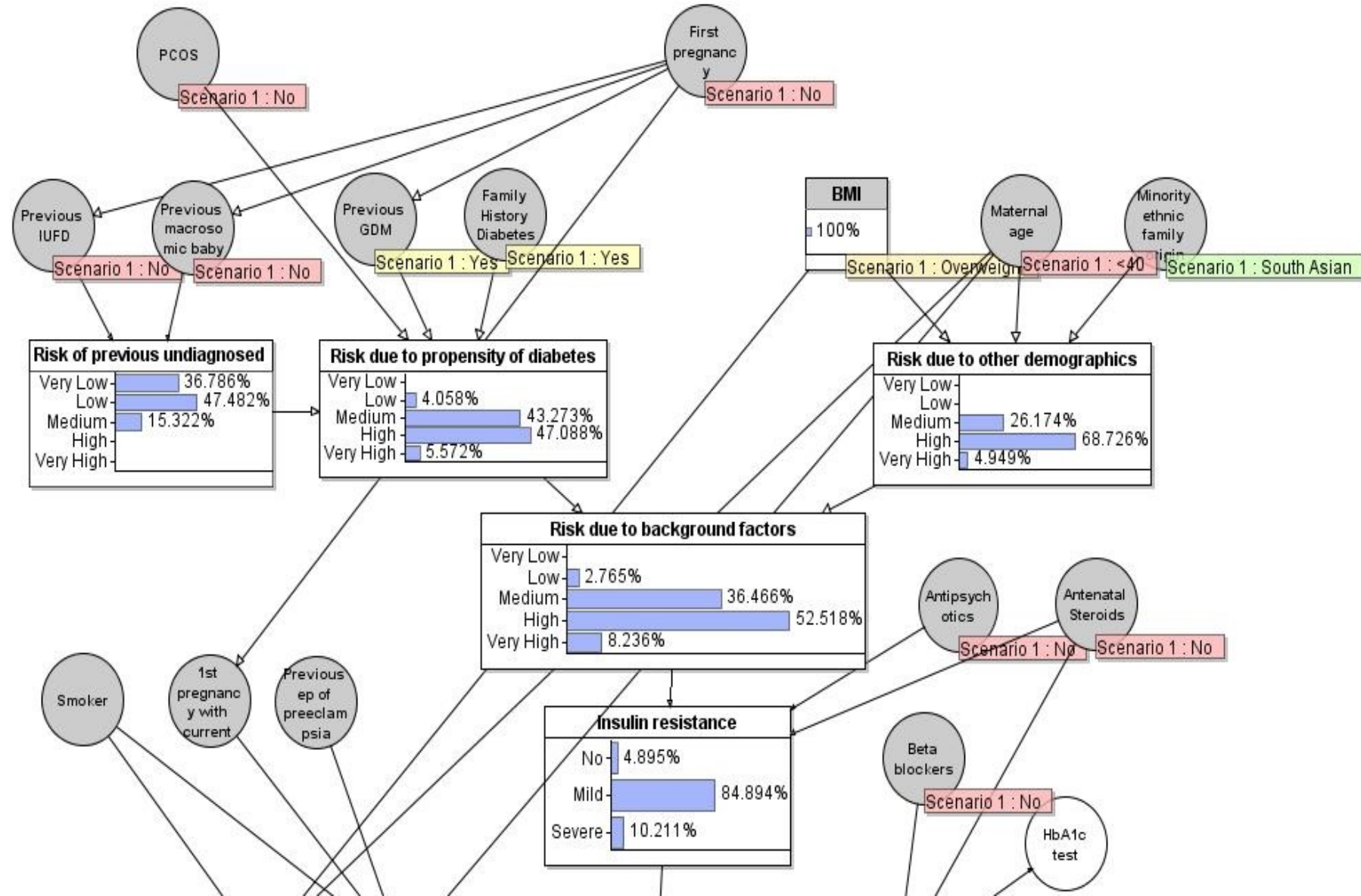**Previous GDM**
Diabetic mother
Overweight
South Asian
No Antipsychotics
No Antenatal Steroids
No Beta blockers

Summary of Progress and Future work

- BN development in stages
  - Decision points
  - Initial diagnostic BN nearing completion
  - … applicable to later stages
- Initial work on 'treatment' BN

- Diagnostic BN
  - Training with data
  - Evaluate performance and refine
- Treatment BN
  - Elicitation of additional structure
- Plans for self-management BN