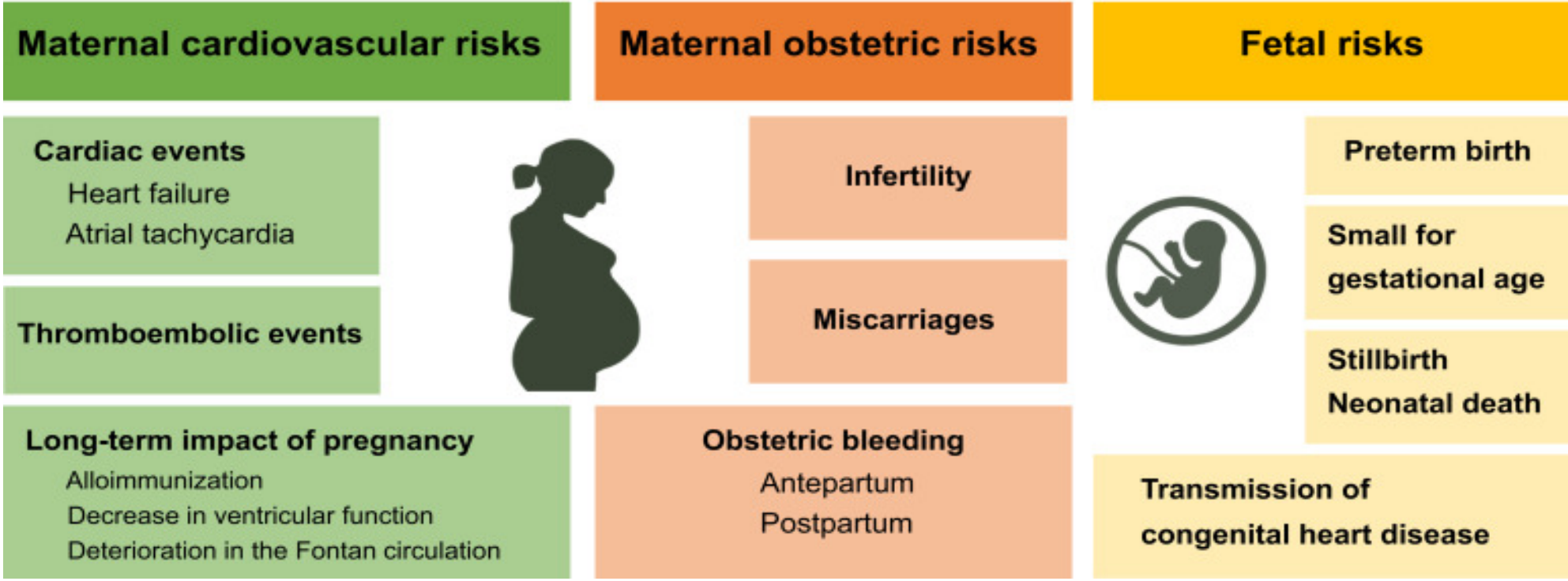
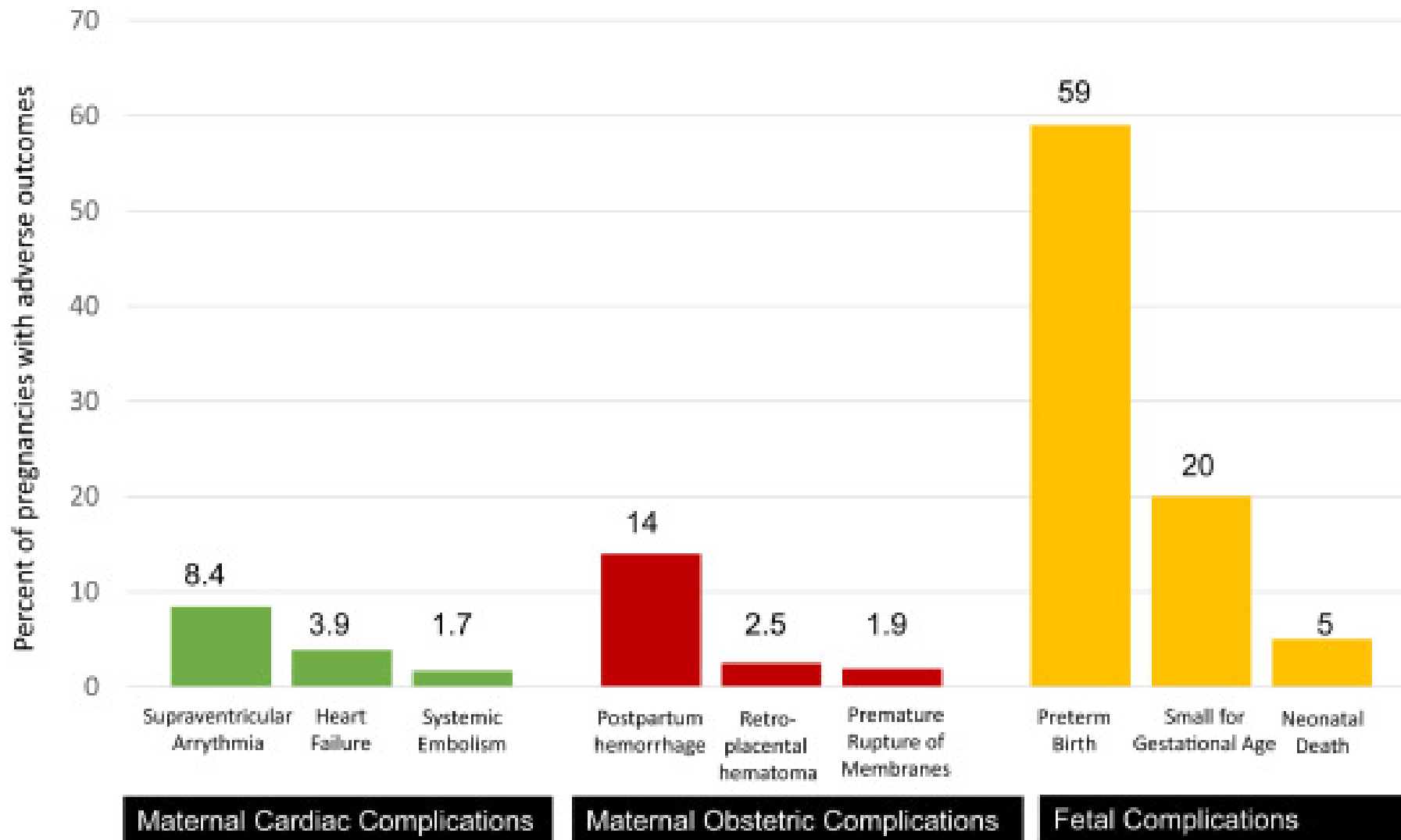


# ***The Fertility and Pregnancy Journey with a Fontan Circulation – personal experiences and best practices***

Diana Klassen & Dr Marla Kiess



Wichert-Schmitt, D'Souza, Silversiders, 2022



Wichert-Schmitt, D'Souza, Silversiders, 2022

# Hemodynamic changes in pregnancy

	<i>Pregnancy</i>	<i>Peripartum (during L&amp;D)</i>	<i>Postpartum</i>
<b>Blood volume</b>	↑ (40 – 50%) and up to 67% for twin pregnancy	↑	↓(auto diuresis)
<b>BP</b>	↓	↑	↑
<b>Heart rate</b>	↑ (10 – 15 beats/min)	↑	↓
<b>Cardiac output</b>	↑(30-50%) and an additional 10-20% for twin pregnancy	↑	↓

ESC Guidelines. 2011

# Pre pregnancy assessment:

- Pregnancy ought to be a planned event in individuals with a Fontan circulation.
- Pre pregnancy appointment in cardiac obstetrics (COB) clinic:
  - Status and history of any Fontan complications (Heart Failure, arrhythmias, blood clots)
  - Physical assessment (weight, cyanosis, oxygen saturations)
  - Heart Rhythm (ECG)
  - Echocardiogram (heart function assessment)
  - Cardiopulmonary exercise test (exercise capacity)
  - Cardiac MRI (to look for any Fontan circulation obstructions)
  - Assessment of liver and kidney function

# Fertility Challenges in women with Fontan circulation

- Women with a Fontan circulation have challenges conceiving & maintaining pregnancy related to:
  - menstrual irregularities,
  - Fontan circulation +/- complications,
  - hormonal alterations,
  - morphologic uterine abnormalities
- Overall reported rate of miscarriage ranges between 40 – 70% (compared to ~ 15% in general population). Potential causes:
  - Lower oxygen levels in the blood decreases the ability of the fetus to survive
  - Fontan complications such as abnormal valve function or heart failure
  - Pregnancy terminations reported to occur ~7 – 10% -- may also contribute to low live birth rates
- The patient's cardiac status should be optimized prior to pregnancy (heart valve issues should be repaired, heart rhythm corrections [ablations] should occur prior to pregnancy)

# Potential options when fertility is a problem

- In vitro fertilization (IVF)
- Surrogacy

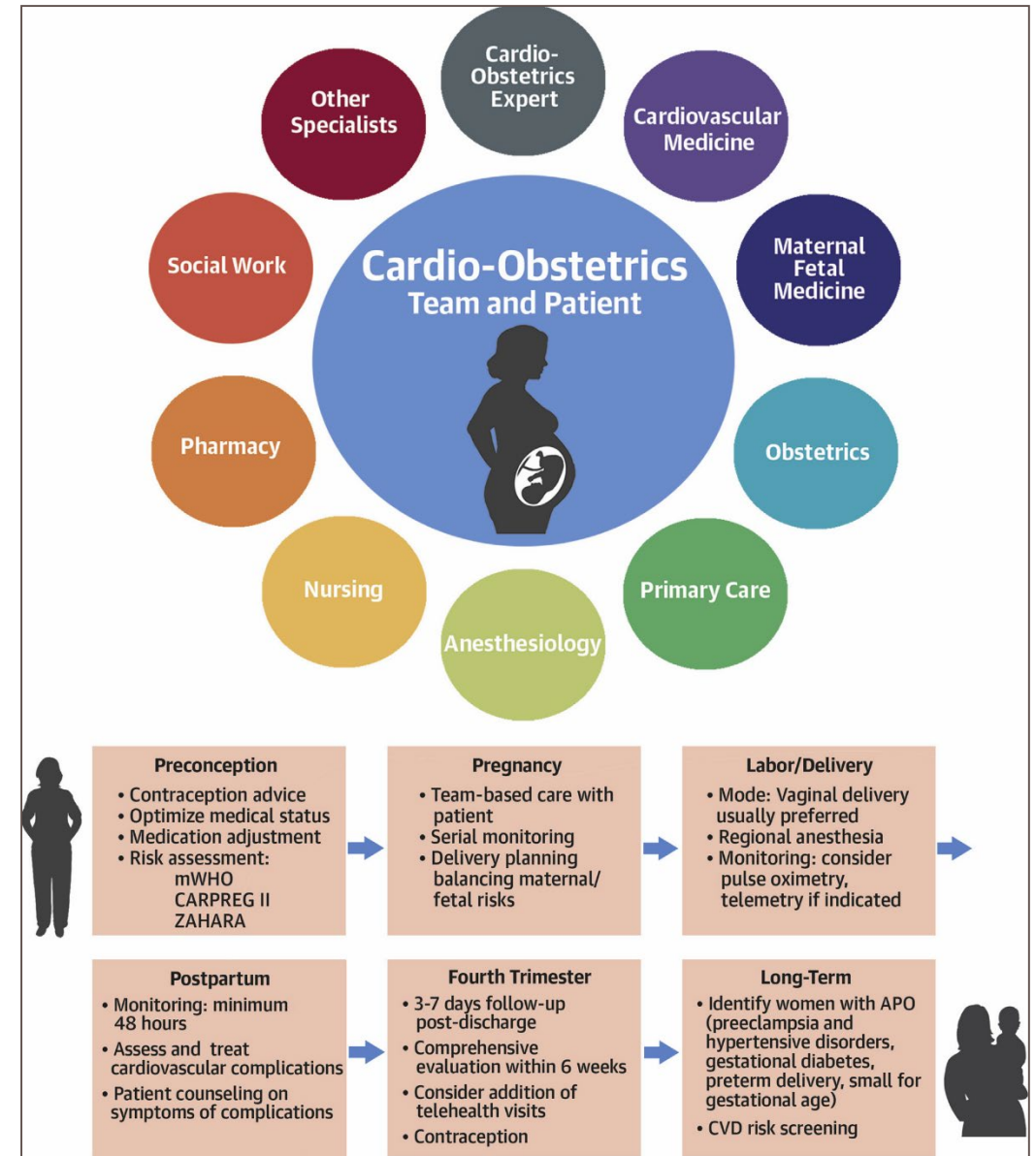
# What to expect before and during pregnancy

- Medications:
  - Some medications cannot be used during pregnancy, so alternative medications may be recommended.
- Frequent visits with Obstetrician and Cardiac Obstetrics Team
- Increased surveillance during pregnancy:
  - Blood tests (eg INR)
  - Echocardiograms
  - Fetal echocardiogram
  - Obstetrical ultrasounds



# Pregnancy Management

- Pregnancy care should be provided by an experienced cardio-obstetric team
- Monitoring plan should be established early in pregnancy
- A labour and delivery care plan should be prepared by the multidisciplinary cardio-obstetric team and circulated well before delivery
- Availability of experienced cardio obstetrics team will determine delivery location



# Recommendations

- Chance of successful pregnancy ↑ when:
  - good physical condition (including Fontan circuit)
  - healthy lifestyle
  - maintain normal weight
  - avoid risky behaviours -- such as alcohol consumption, smoking
- Fontan deterioration time dependent, complications impact ability to carry viable pregnancy -- ?? benefits of considering pregnancy at younger age (if possible!)



# Contraception

- Estrogen containing formulations are contra-indicated because they can cause blood clots to form in the Fontan circuit.
- Safe & reliable to use:
  - Progesterone only contraceptive methods (pills, injectables & implants)
  - Copper and hormone IUDs
  - Emergency contraception → progesterone pill within 72 hours, progesterone receptor modulator within 120 hours, or placement of copper IUD

*Wichert-Schmitt, D'Souza, Silversiders, 2022*

# Diana's Journey

Began family planning a few years in advance:

- Experienced some fertility issues
  - underwent fertility treatment
  - IVF (In vitro fertilisation) to address fertility issues
- Obstetrical Complications
  - obstetrical bleeding
  - preterm delivery
- 2 Successful births and 2 healthy children