



UNIQUE PERIOPERATIVE CHALLENGES IN A PARTURIENT WITH CYSTIC FIBROSIS AND CYSTIC FIBROSIS–RELATED DIABETES USING A HYBRID CLOSED-LOOP INSULIN PUMP



Dr Shilpi Sethi ST5 Anaesthetic trainee
Dr Kate Bosworth Consultant Anaesthetist

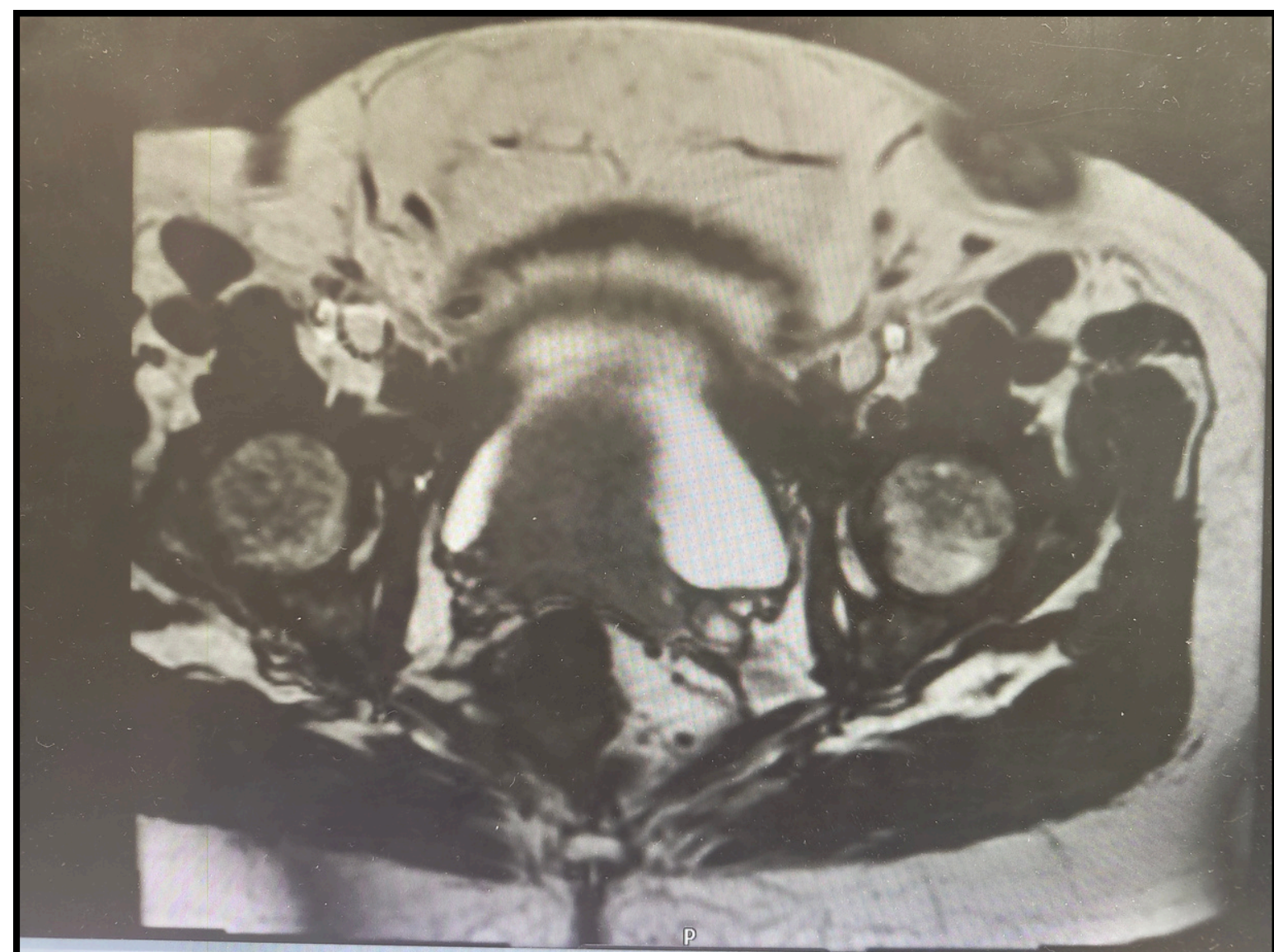
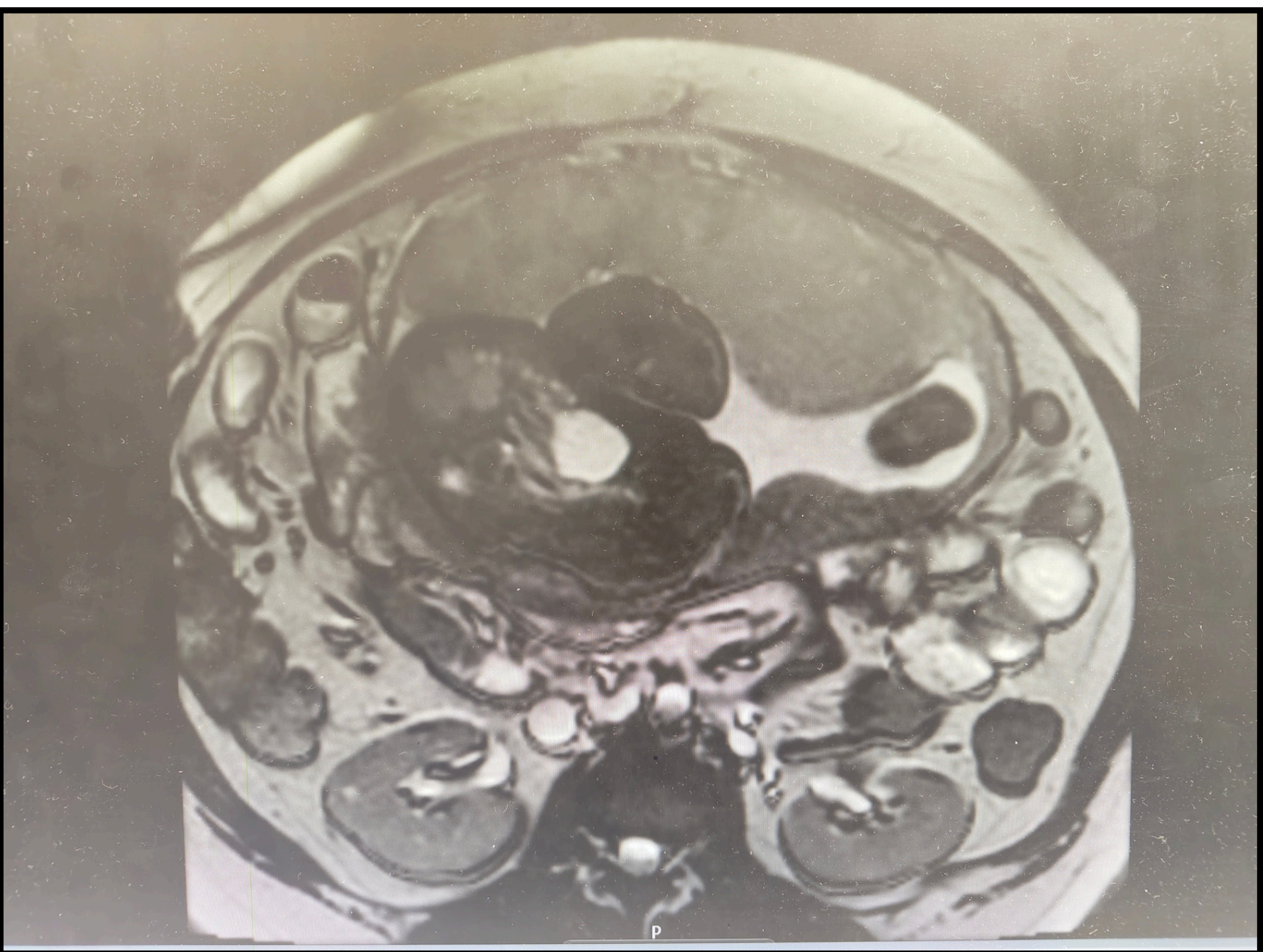
University Hospital Coventry and Warwickshire

Introduction

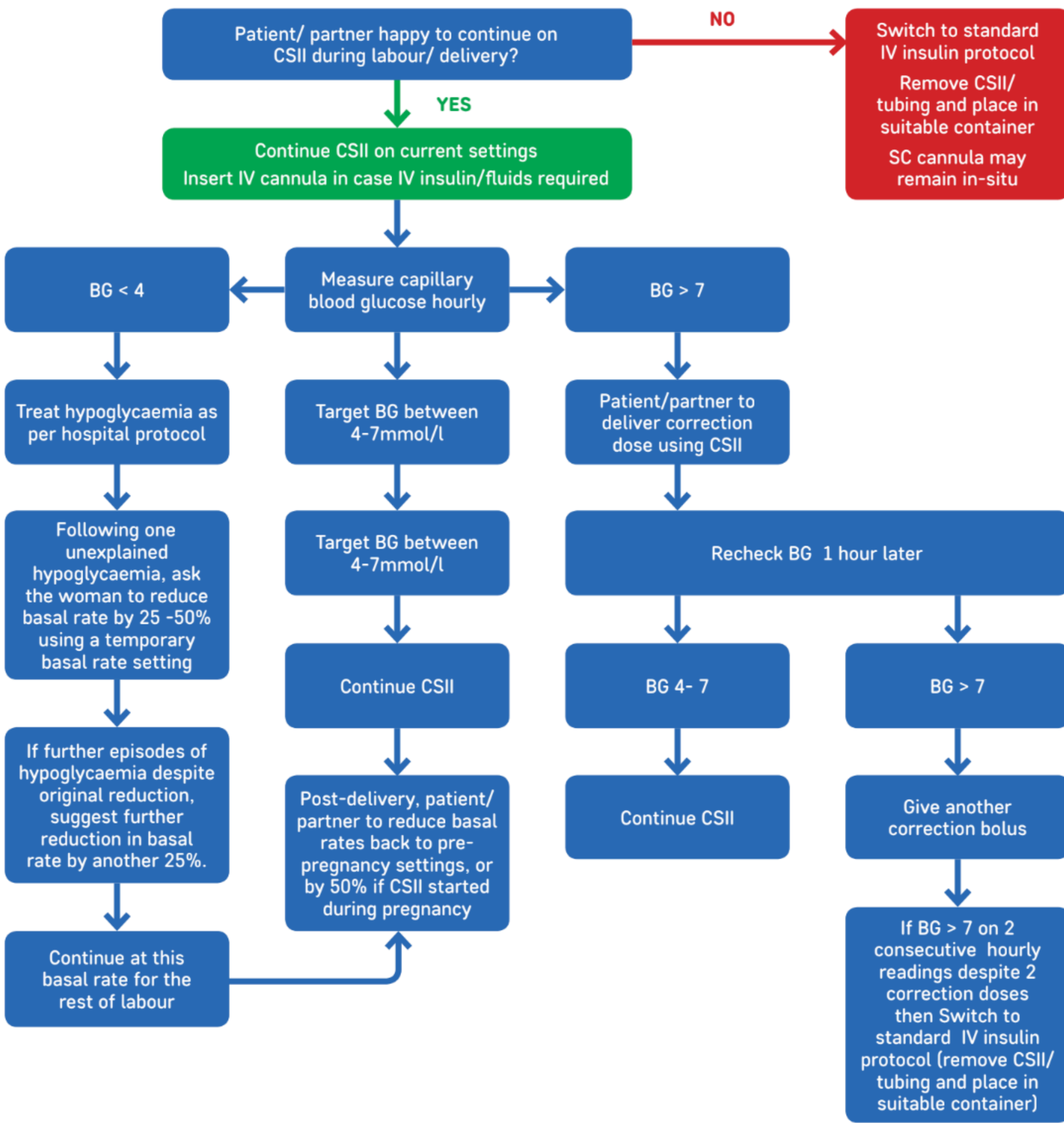
- Cystic fibrosis (CF) is a multisystem autosomal recessive disorder
- Mutations in the CF transmembrane conductance regulator protein [1]
- Viscous secretions and progressive pulmonary and extrapulmonary complications, including cystic fibrosis–related diabetes (CFRD)
- Physiological changes of pregnancy coupled with pathological manifestations of CF pose unique challenges
- Predicting outcomes and managing associated pathologies are crucial in management of CF
- As advances in CF therapy improve life expectancy, pregnancies in individuals with CF—and concomitant use of rtCGM and insulin pump technologies—are becoming increasingly common [2]

Case Report

- 35-year-old primigravida at 38 + 1 weeks' gestation with CF complicated by chronic Burkholderia cepacia colonisation and pregestational CFRD managed with a hybrid closed-loop insulin pump
- History of neonatal colostomy and ileostomy
- Clinically stable on inhaled bronchodilators and aerosolised antibiotics, with normal spirometry.
- Pelvic MRI demonstrated dense adhesions between the uterus, abdominal wall, and anterior bladder dome, prompting a recommendation for elective cesarean delivery
- Comprehensive preoperative counselling was undertaken regarding anaesthetic options (spinal, combined spinal–epidural, or general anaesthesia) given the anticipated prolonged surgical duration
- A shared management plan with endocrinology supported continued patient-led pump use with preparedness to transition to a variable-rate intravenous insulin infusion (VRII) if glycemic instability occurred
- Cesarean delivery proceeded uneventfully under spinal anaesthesia
- Postpartum haemorrhage requiring return to theatre necessitated conversion to VRII
- The remainder of her postoperative course was uncomplicated



APPENDIX 3: WOMEN USING CSII ADMITTED IN LABOUR OR FOR ELECTIVE CAESAREAN SECTION



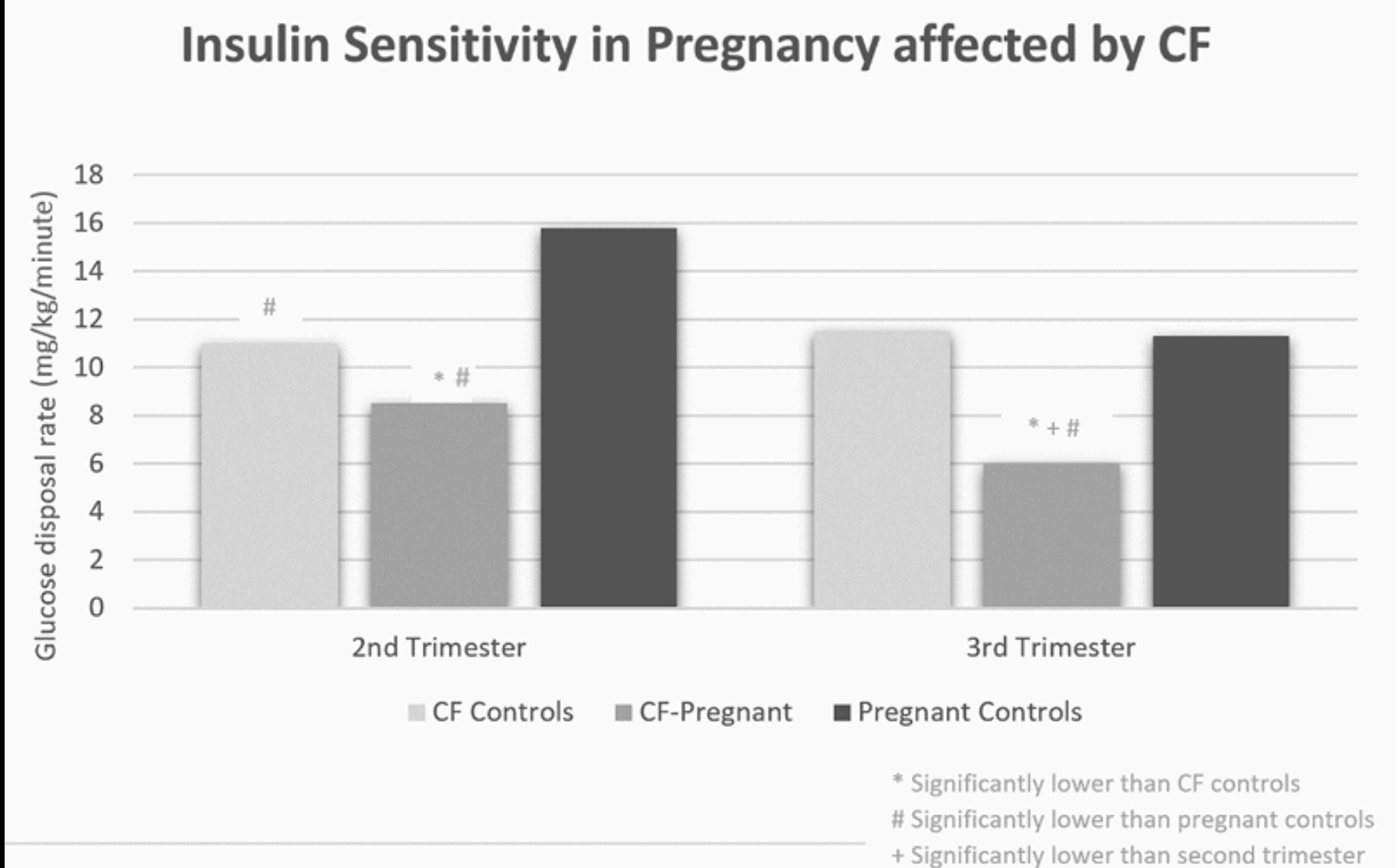
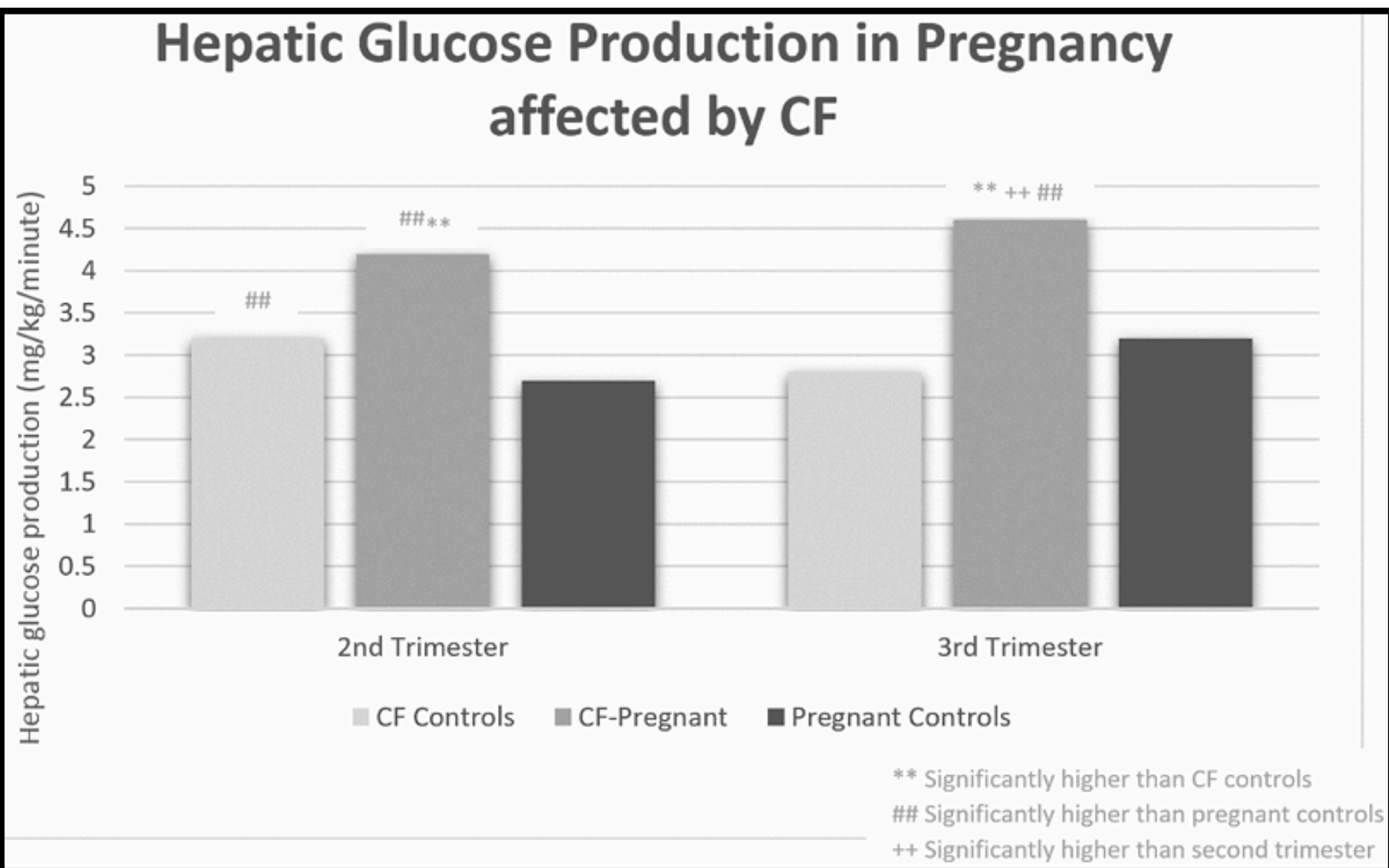
Discussion

- For women with CF, pregnancy carries added health risks, including higher rates of pneumonia, renal failure, and rarely death, with a mortality rate of 1% [3]
- Severe pulmonary disease (FEV1 < 50%), pulmonary hypertension, Burkholderia Cepacia infection, and exocrine pancreatic insufficiency have been shown to be important predictors of poor maternal outcomes
- During pregnancy, women with CF experience increased frequency of pulmonary exacerbations, hospitalizations and illness-related visits
- Early mobilisation and assisted physiotherapy is critical in the postnatal period to help in clearance with clearance of the airways and improved ventilation

Cystic Fibrosis-Related Diabetes

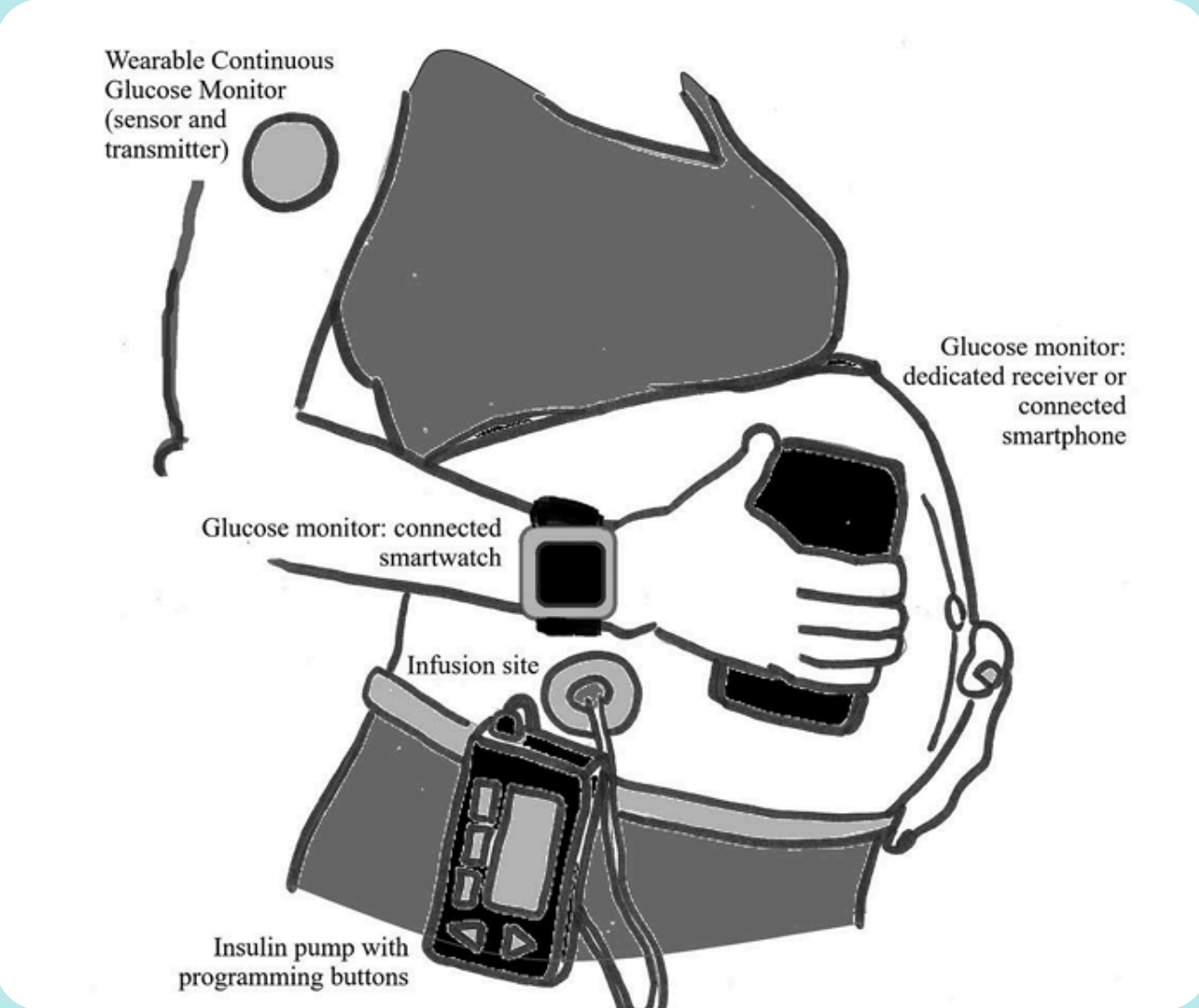
- Be aware of insulin sensitivity [4]
- Dysglycemia, post prandial hyperglycemia, reactive hypoglycemia
- VRII cannot be put through portocath
- Early liaison/low threshold with anaesthetics team for vascular access
- For women with diabetes / gestational diabetes who are having a planned caesarean section, the need for a variable rate intravenous insulin infusion (VRII) should be discussed on an individual basis

MAYFLOWERS Study



Conclusion

- Highlights the unique perioperative challenges posed by the intersection of CF, CFRD, and closed-loop insulin delivery systems in obstetric anaesthesia
- Thorough preoperative assessment, structured shared decision-making, and close multidisciplinary collaboration are essential to optimise maternal and fetal outcomes



- Women whose diabetes is managed by insulin pump could continue to use this during labour/C section at discretion of diabetes team and the wishes of individual

- Prompted updating of departmental Obstetric Anaesthesia Handbook

References

- [1] Deighan M, Ash S, McMorro R. Anaesthesia for parturients with severe cystic fibrosis: a case series. Int J Obstet Anesth. 2014 Feb;23(1):75–9
- [2] Marks BE, Kilberg MJ, Aliq E, Fredkin K, Hudson J, Riva D, Román C, Kelly A, Putman MS. Perceptions of Diabetes Technology Use in Cystic Fibrosis–Related Diabetes Management. Diabetes Technol Ther. 2021 Nov;23(11):753–759. doi: 10.1089/dia.2021.0201. Epub 2021 Jul 20. PMID: 34185606.
- [3] Oxman R, Roe AH, Ullal J, Putman MS. Gestational and pregestational diabetes in pregnant women with cystic fibrosis. J Clin Transl Endocrinol. 2021 Dec 5;27:100289. doi: 10.1016/j.jcte.2021.100289. PMID: 34984172; PMCID: PMC8693285.
- [4] Rogers WK, Chugaieva I, Moheet A, Wernimont SA. Diabetes Mellitus in Pregnancy: Implications for Obstetric Anesthesia. Anesthesiology. 2025 Aug 1;143(2):424–443