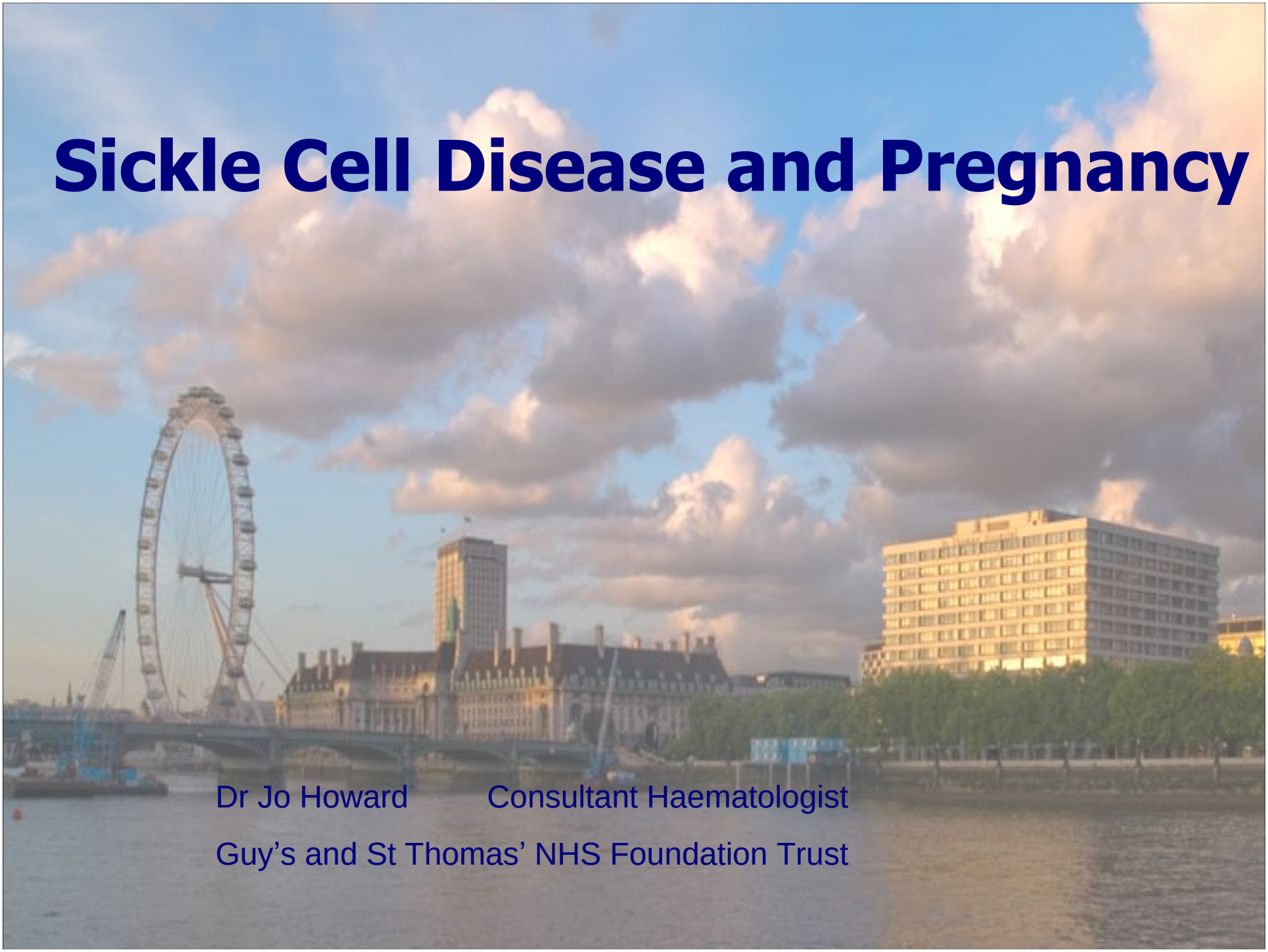


Sickle Cell Disease and Pregnancy

Dr Jo Howard Consultant Haematologist

Guy's and St Thomas' NHS Foundation Trust

Pregnancy

- NHS Screening Programme Update
- Sickle cell disease
  - Risks of pregnancy
  - Antenatal care
- Role of transfusion in pregnancy in Sickle Cell Disease

NHS Screening Programme update

- NHS Sickle Cell and Thalassaemia Screening Programme: 2001-2013
- Moved to Public Health England 2013
- First linked antenatal and neonatal screening programme
- High risk areas: all women screened
- Low risk areas: FOQ used and women screened if they or partners are from high risk area (and red cell indices for thal)

NHS Screening Programme 2010/11 figures

723,768

Pregnant women screened

17,354

Carrier women

358

Clinically affected babies

Approx 50%

Partners screened

9830

Carrier babies

940

High risk couples

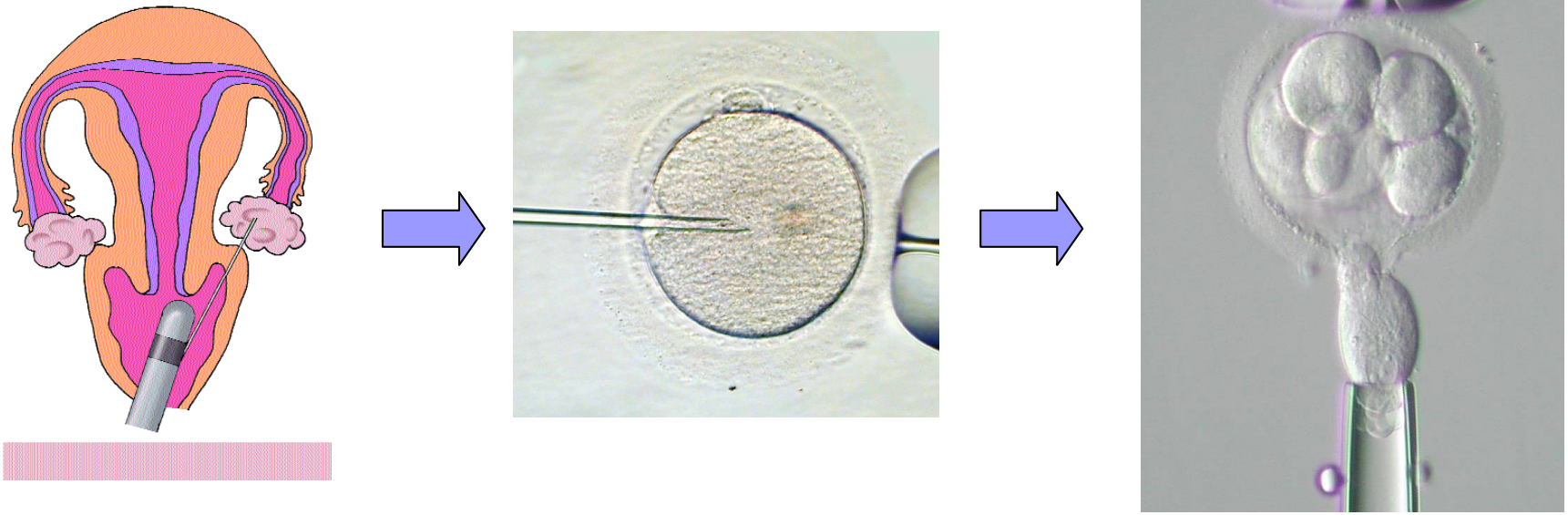
420

Pre-natal diagnosis

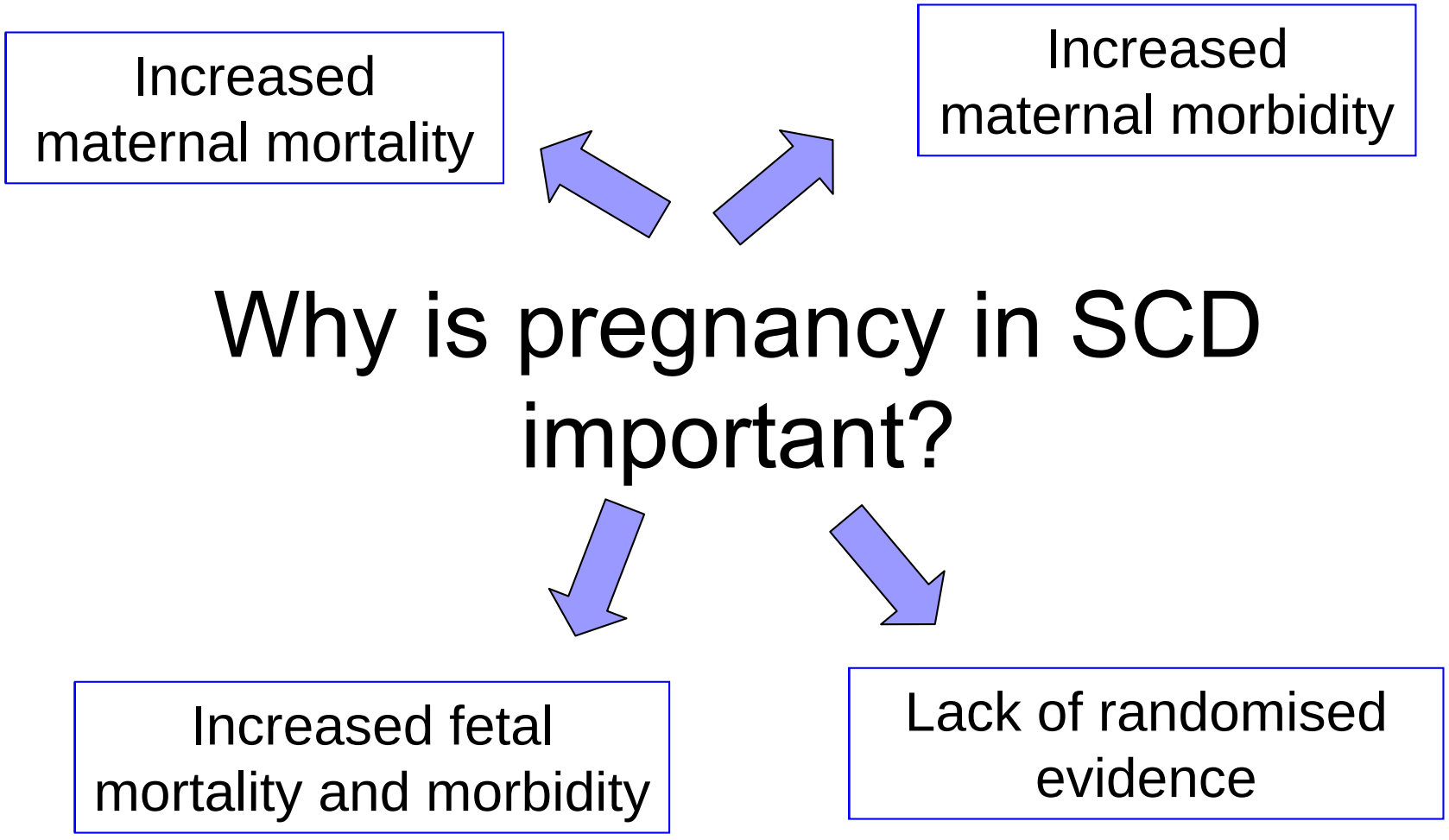
Programme offers reproductive choide

- Pre-implantation genetic diagnosis (PIGD)
- Pre-natal diagnosis (PND)
- Watch and wait

Pre-implantation genetic diagnosis (PIGD)



Pregnancy in women with SCD


Increased maternal mortality
Increased maternal morbidity
Why is pregnancy in SCD important?
Increased fetal mortality and morbidity
Lack of randomised evidence

Royal College of
Obstetricians and Gynaecologists

Bringing to life the best in women's health care

Green-top Guideline No. 61

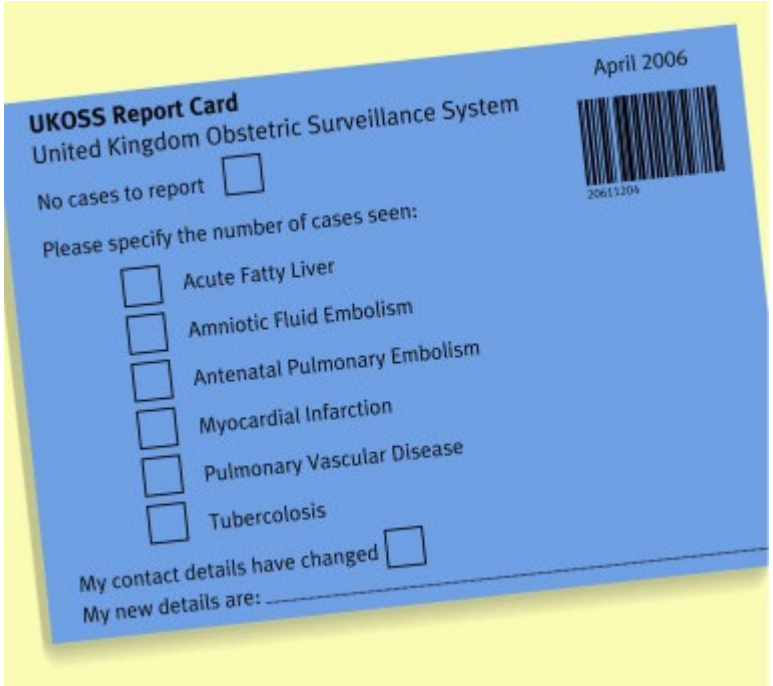
July 2011

Management of Sickle Cell Disease in Pregnancy

UK Obstetric Surveillance Survey

- Feb 2010 – Jan 2011
- Every hospital in UK with consultant-led maternity service
- Monthly reporting card
- Completion of data collection report

- 108 confirmed cases



Increased maternal mortality

- Range from 0% to 9.2% in studies of centres across the world
- UK national data: approx 1 death per year

- US Co-operative study (1980's, 1990's)
  - 0.4% mortality
- US In-patient sample 2000-2003
  - 72.4 deaths per 100,000 in SCD (0.07%)
  - 12.7 deaths per 100,000 overall (0.01%)

What risks to women with SCD face when they become pregnant?

Hypertension and pre-eclampsia

Acute painful crisis

Anaemia

What risks to women with SCD face when they become pregnant?

Infections

VTE

Acute chest syndrome

Caesarean section

Maternal morbidity

	BP/PET	Pain	UTI	Anaemia	Csn
Ngo: SS	9.5%	42%	24%	11%	64%
Yu	9%	47%	28% (all)	32%	30%
Chase	11%	25%	-	-	39%
UKOSS	9%	31%	11%	12%	48%
GSTT: SS	7.8%	6.7%	3%	34.3%	61%
: AA	0%	-	1%	2%	31%

What are the fetal complications in SCD?

Preterm delivery

Fetal growth restriction

What are the fetal complications in SCD?

Increased fetal distress in labour

Fetal complications

	Perinatal mortality	Fetal growth restriction	Prematurity		
Ngo: SS	2.1%	14%	16%		
Yu	1.4%	18%	24%		
Chase	2.4%	20%	19%		
UKOSS	2.7%	-	-		

Antenatal care

Pre-pregnancy care

- Vaccination and medication advice
- Partner screening
- Assessment for chronic disease complications
  - Pulmonary hypertension screening
  - Bp and urinalysis
  - Retinal screening
  - Screen for iron overload
  - Red cell antibodies

Antenatal care

- Many women present for the first time in pregnancy
- Multidisciplinary team approach

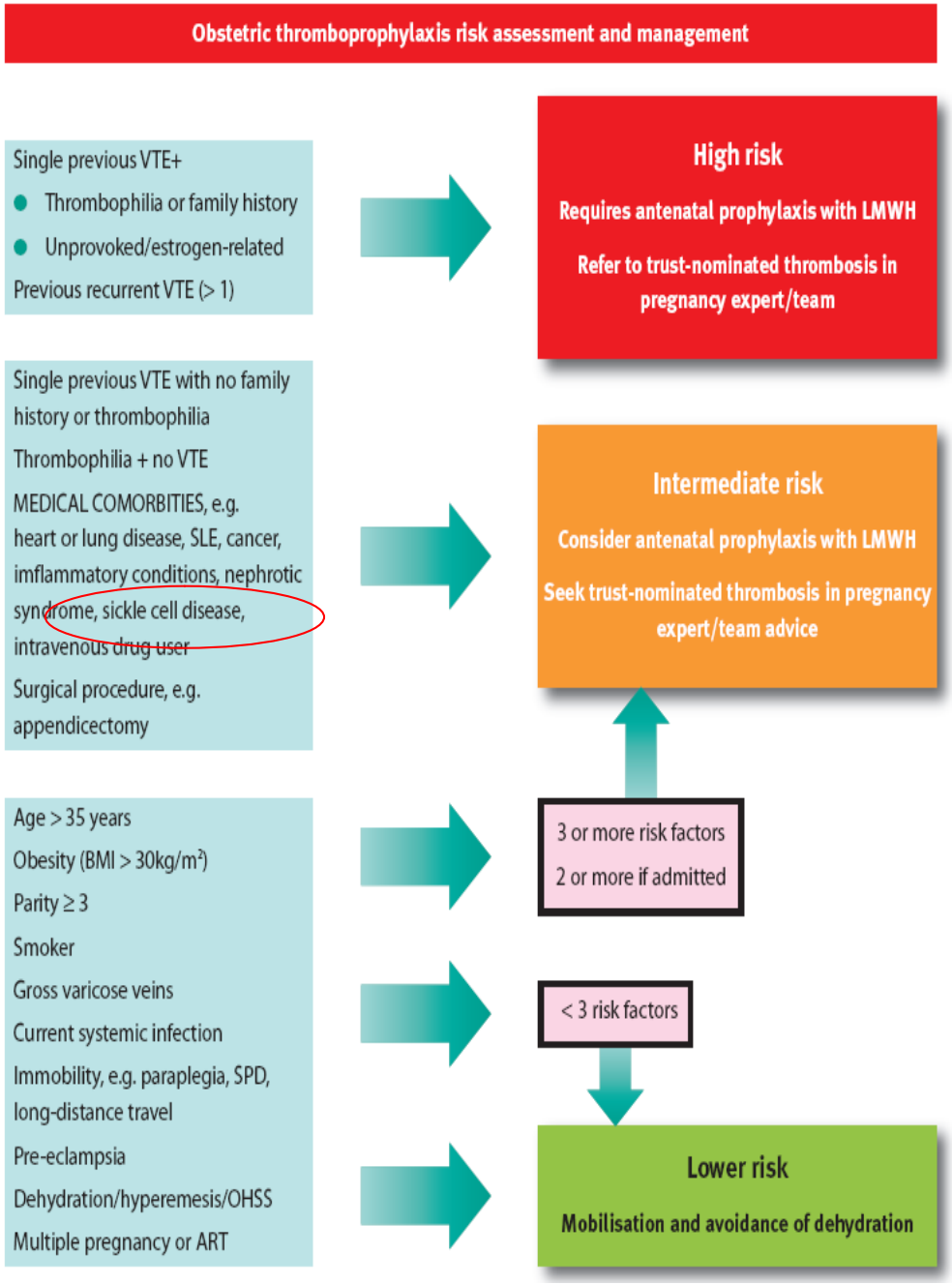
- Manage as for pre-pregnancy care
  - Chronic complications screen/partner testing/medication review
  - Blood group and antibody screen
  - Extended phenotype

- Increased antenatal appts and USS
  - Bp and urinalysis every visit
  - Monitor fetal growth

Medications during pregnancy

- Folic acid 5mg od
- Penicillin V 250mg bd
- Iron supplementation ONLY if evidence of iron deficiency
- Aspirin 75mg od from 12/40
  - Applying evidence from pre-eclampsia data
- Consider thromboprophylaxis
- STOP hydroxycarbamide, ACE inhibitors

Antenatal assessment and management (to be assessed at booking and repeated if admitted)



Antenatal care

- Acute painful crisis
  - Treat as in non-pregnant patient
  - Fluids, analgesia, oxygen
- Delivery
  - Consider induction at 38-40 weeks
  - Vaginal delivery as recommended mode of delivery
  - Cross match blood if atypical antibodies are present

Transfusion in pregnancy in Sickle Cell Disease

Transfusion in pregnancy

- Early retrospective studies showed decrease in maternal and perinatal mortality in transfused patients when compared with historical controls
- BUT high risk of adverse effects
  - Alloimmunisation
  - Haemolytic disease of the newborn
- How many patients do we transfuse and who should we transfuse?

UK Obstetric Surveillance Survey

- 26 women (24%) required antenatal transfusion (45% of SS women, 5% of SC)
- 15 women had top up
- 11 women had exchange transfusion
  - 5 had one exchange only
  - 6 had repeated exchanges

UK observational data

- 1991-1993, 81 pregnancies
- 22/33 SS pregnancies were transfused
- 7/29 SC pregnancies were transfused
- No difference in maternal or fetal complications between two groups
- High rate of complications in third trimester, increased pain in untransfused group

Howard et al 1995

Role of transfusion in pregnancy - Randomised controlled trial

	Prophylactic transfusion	Transfusion if clinical indication
Transfused units	12	3
Painful crises	5	11
Acute chest syndrome	2	3
Fetal distress	10	8
Fetal growth restriction	5	7
Stillbirth	4	2

Koshy et al 1988

French observational data

- Jan 1994 – Dec 2004. 128 women with SCD
- All women received partial exchange transfusion from 22-26 weeks
- Despite prophylactic transfusion, there was still increased incidence of pain, pre-eclampsia and fetal complications
- 5% alloimmunisation, lead to IUD in one case

Ngo et al 2010

Possible benefit of exchange transfusion

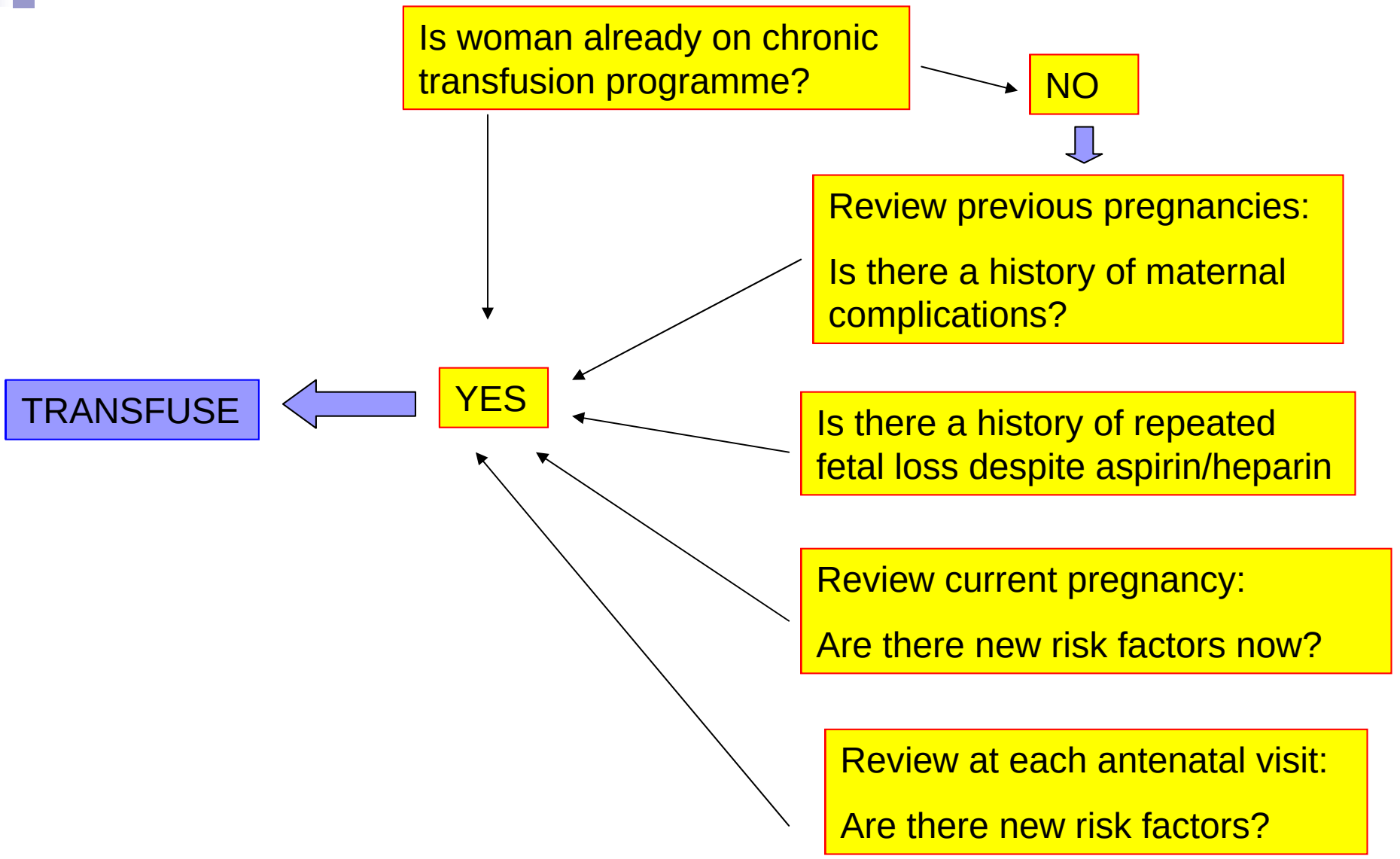
- 14 women received erythrocytopheresis (vs 17 transfused for severity)
  - Decrease in IUGR and oligohydramnios
- 103/131 women had erythrocytopheresis.
  - Decreased maternal complications
  - Decreased IUGR and prematurity
- Limitations - Not controlled studies

Gilli et al 2007

RCOG Guidelines

- Routine prophylactic transfusion is not recommended during pregnancy for women with Sickle Cell Disease
- If acute exchange transfusion is required for the treatment of sickle complications it may be appropriate to continue the transfusion regimen for the remainder of the pregnancy
- Blood should be matched by extended phenotyping including full rh (C, D and E) and Kell typing.

Indication for transfusion	Comment
Woman with previous serious medical, obstetric or fetal complication	Exchange or top-up depending on clinical indication and decided in MDT
Woman on regular transfusion prior to pregnancy for primary or secondary stroke prevention or prevention of severe complications	Transfusions to continue
Twin pregnancy	Prophylactic transfusions to be considered due to high rate of complications
Acute anaemia (Hb <6g/dl, fall of >2g/dl from baseline)	Top-up transfusion
Acute chest syndrome or acute stroke	Exchange transfusion


Is woman already on chronic transfusion programme?
NO
Review previous pregnancies:
Is there a history of maternal complications?
YES
TRANSFUSE
Is there a history of repeated fetal loss despite aspirin/heparin
Review current pregnancy:
Are there new risk factors now?
Review at each antenatal visit:
Are there new risk factors?

Top up vs Exchange transfusion

- Hb < baseline
- Hb <60-70g/dl

- Cheap, easy
- No equipment or skills needed

- Does not reduce S% as well
- Iron loading

- For acute complication if Hb >90g/dl

- Needs special equipment and training

- Able to control HbS% well
- Less iron loading
- Increased blood volume and donor exposure

Conclusions

- Pregnancy in sickle cell disease is a time of increased maternal and fetal risk
- Careful monitoring during pregnancy is vital
- In UK 45% of SS women receive transfusion during pregnancy
- Prophylactic transfusion is not indicated, but risk-benefit analysis should be performed for each patient
- Always give Rh CDE and Kell matched blood
- The role of transfusion in pregnancy needs further research

Thank you to the Sickle Team at St Thomas' Hospital:

Mr Eugene Oteng-Ntim

Dr Sue Robinson

Dr Rachel Kesse-Adu

Mr Neill Westerdale