

# PIGF-based testing for pre-eclampsia

An Environmental  
Assessment

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Oxford   
Academic Health  
Science Network



**Sustainable  
Healthcare  
Coalition**

# Environmental Impact of PIGF-based testing for pre-eclampsia

<b>Title</b>	PIGF-based testing for pre-eclampsia
<b>Organisation</b>	Oxford Academic Health Science Network.
<b>Company website</b>	<a href="https://www.oxfordahsn.org/">https://www.oxfordahsn.org/</a>
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<b>Completion date</b>	July 2021
<b>Care pathway description:</b>	Peripartum Maternity Care
<b>Environmental issues appraised:</b>	Global warming potential (IPCC, CO <sub>2</sub> eq, 100-year) Water consumption (m <sup>3</sup> ) Waste generation (kg)
<b>Supporting information:</b>	PIGF-based testing to help diagnose suspected pre-eclampsia <sup>1</sup>

## Conclusions

Based on the NICE guidance DG23 Resource Impact Model<sup>1</sup>, there were 920 projected admissions for suspected pre-eclampsia (PE) at the Oxford John Radcliffe Hospital prior to PIGF-based test being deployed and 536 after, a potential saving of 386 admissions per year. GHG emissions saved per avoided admission to hospital is **91kg CO<sub>2</sub>eq** and **35t CO<sub>2</sub>eq** across the Hospital. Similarly, **37m<sup>3</sup> of water** and **1.9t waste** are avoided. The majority of these savings are due to lower patient travel and hospital inpatient impacts.

Assuming similar rates of admission across the country, adoption across all NHS England's Maternity Units might equate to a 12,500 reduction in the number of admissions for suspected PE and potential savings of **1,149 t CO<sub>2</sub>e**, equivalent to 3 million miles car travel. Projected potential cost savings, if adopted across NHS England, are expected to be in the region of £4 million per year, based on an estimated saving of £250-£600 per woman tested. The savings result from reduced admissions and monitoring.

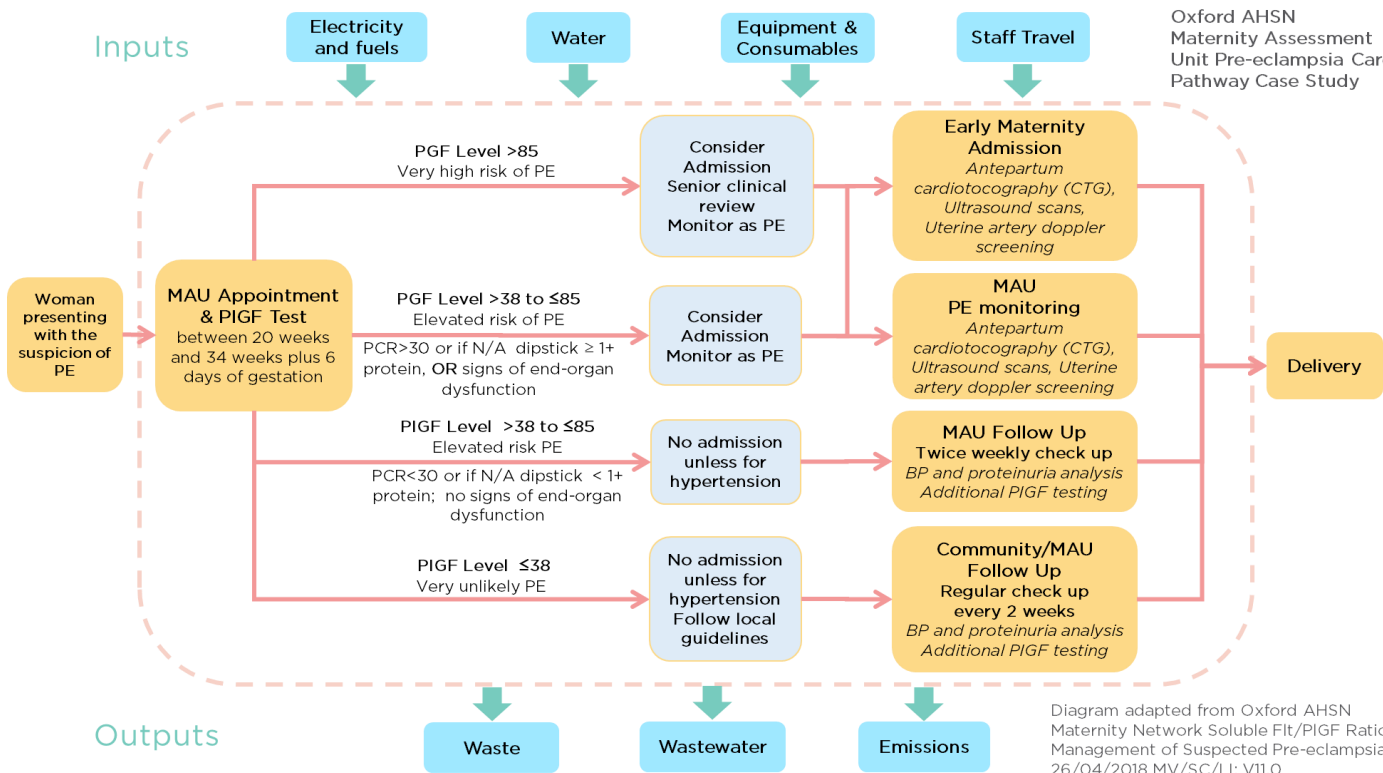
## Introduction

Quick, accurate blood tests which can help rule out pre-eclampsia are improving care for pregnant women and their unborn babies, reducing anxiety and saving the NHS money. In 2017, the Oxford Academic Health Science Networks (AHSN) initiated a project to drive the uptake of placental growth factor (PIGF)-based testing across the NHS England Thames Valley region and is working with all AHSNs on the national roll-out and adoption of PIGF-based testing into standard clinical practice.

PE complicates up to one in every 20 pregnancies and is a major cause of maternal and foetal morbidity worldwide, impacting pregnant women and their families and placing significant economic and capacity burdens on maternity systems. Clinical teams tend to adopt a precautionary approach to PE and a low threshold to admitting pregnant women when it is suspected. However, only a small proportion of these (around 3%-5%) go on to develop PE, meaning that overall resources are deployed inefficiently and clinical focus is diverted away from the true cases. This highlights the importance of a more accurate test.

As with most diagnostic tests, simply adopting the test into existing clinical care pathways will likely only add cost with limited additional benefit for the clinical team or pregnant women under their care. As such, clinical and laboratory teams must adopt new pathways to incorporate PIGF-based testing into standard clinical care.

<sup>1</sup><https://www.nice.org.uk/guidance/dg23/chapter/1-recommendations>



NB. The above pathway specifies diagnostic cut-offs using the Elecsys sFlt-1:PIGF ratio test from Roche Diagnostics, which is employed in standard clinical practice at the Oxford John Radcliffe Hospital at the time of writing. A second test, the Triage PIGF test from Quidel Corporation, is also recommended under DG23 (2016) and is associated with a similar decision pathway.

When care pathways are adapted to benefit from the introduction of PIGF-based testing, positive impacts are seen on workload and costs incurred by both maternity and paediatric services as a result of fewer pre-term births; and cost savings based on fewer outpatient visits, admissions, pre-term deliveries and less onward neonatal care.

## Scope

The GHG emissions, water consumption and waste product impacts of the care pathways with and without PIGF-based testing have been considered in this appraisal by using the reference data set out in the 'Care Pathways: Guidance on Appraising Sustainability' guidance document<sup>2</sup>.

Data to estimate the GHG impact of avoided travel and inpatient bed days have been sourced from the care pathways guidance document. The inpatient reference data include, use of consumables, equipment, medical gas use, staff travel and building energy, water and waste. The impact of the PIGF test has been estimated from literature. The unit of analysis for this appraisal is per peripartum maternity patient.

## Reason for study

The cost and clinical resource benefits of adopting PIGF-based testing into properly designed maternity care pathways are well established. Many of these benefits will also bring environmental co-benefits. The interest in completing this study is to better understand the potential trade-offs in the environmental impacts associated with maternity service delivery incorporating PIGF-based testing for diagnosis of PE when compared with the environmental impacts associated with the traditional pathway.

<sup>2</sup> <https://shcoalition.org/sustainable-care-pathways-guidance/>

The assumptions, outcomes and results of the analysis are given in the tables below.

## Assumptions

Number of admissions per year for suspected PE:	
pre PIGF-based testing	920
post PIGF-based testing	534
Number of admissions saved per year	386
Follow up appointments per week:	
Without suspicion of PE	0.5
With suspicion of PE	2.5
Gestational period following PIGF-based test over which appointments could occur	3 weeks
Average length of inpatient stay per admission (hours)	36

## Outcomes

Follow up appointment journeys saved per diagnosis without suspicion of PE	6
Number of PIGF-based tests administered	920
Number of patients confirmed without suspicion of PE following test	386
Total number of follow up journeys saved	2316
Avoided Inpatient bed days	579
Avoided patient journeys to elective care	386

## Results

Activity Name	Number of occurrences avoided	GHG intensity (kg CO <sub>2</sub> eq/Activity)	GHG emissions avoided (kg CO <sub>2</sub> eq)	Contribution to total saving (%)
Patient self travel to elective care	4,632	2.9	13,433	38%
Low-intensity bed day	579	37.9	21,944	62%
Blood tests administered	920	0.116	107	0%
<b>Total</b>			<b>35,484</b>	<b>100%</b>
Savings per avoided admission			91.65	
Extrapolation to NHS England patient population			1,149,000	

## Acknowledgements

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