Introduction and Objectives Patients with pulmonary arteriovenous malformations (PAVMs) are difficult to assess for anaesthetic risks. Generally, they display well-preserved exercise tolerance, yet may have very low oxygen saturation due to their anatomical intrapulmonary right-to-left shunts. During pre-operative assessments in the general population, anaerobic threshold and peak VO_2 , measured by cardiopulmonary exercise testing (CPET), are increasingly recommended to identify high-risk patients, and appropriately plan post-operative management. For example, "high-risk" for major abdominal surgery has been suggested as an anaerobic threshold $<11 \text{ ml min}^{-1} \text{ kg}^{-1}$ and peak $\text{VO}_2 <20 \text{ ml min}^{-1} \text{ kg}^{-1}$.

Methods In order to evaluate "pre-operative" risk categories for PAVM patients, anaerobic threshold and peak VO_2 , measured by ethically approved research cardiopulmonary exercise tests, were evaluated.

Results 26 PAVM patients underwent research CPET evaluations between April 2011-May 2017. Their median age was 57 years (interquartile range (IQR): 42–66). 16 (61.5%) were male. The median oxygen saturation (SaO_2) was 92% (IQR: 88–95) and median haemoglobin 15.6 g/dl (IQR: 14.2–16.6). Overall, the PAVM group achieved a median 92% of the predicted maximum work (IQR: 67–106), anaerobic threshold ranged from 7.6–24.5 $\text{ml min}^{-1} \text{ kg}^{-1}$ (median: 12.35; IQR: 9.5–17.35), and peak VO_2 ranged from 11.2–45.5 $\text{ml min}^{-1} \text{ kg}^{-1}$ (median: 19.8; IQR: 16.7–28.4). Anaerobic threshold placed 11/26 (42.3%) in the suggested high-risk category for major abdominal surgery. In this group, the anaerobic threshold ranged from 7.6–10.8 $\text{ml min}^{-1} \text{ kg}^{-1}$. Similarly, peak VO_2 placed 14/26 (53.8%) in a high-risk category. Their peak VO_2 ranged from 11.2–16.5 $\text{ml min}^{-1} \text{ kg}^{-1}$. There was full concordance between the categories determined by the 2 measurements. Notably, 6 patients were retested 3–31 months after embolization treatment resulting in increased SaO_2 . However, there was no increase in anaerobic threshold or peak VO_2 , and the 3 patients from this group initially in a higher risk category remained.

Conclusion Anaerobic threshold and peak VO_2 suggest high proportions of PAVM patients are in a high-risk pre-operative risk category. The data suggest an important role for anaesthetic assessments. Noting that 1 in 2600 people are estimated to have PAVMs, further study is recommended to develop appropriate clinical guidance, and allocate resources to optimise care.

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PROGNOSTIC FACTORS FOR SURVIVAL IN IDIOPATHIC PULMONARY ARTERIAL HYPERTENSION

CR Popplewell, A Greenhalgh, PA Corris. *Freeman Hospital, Newcastle-upon-Tyne, UK*

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Introduction Idiopathic pulmonary arterial hypertension (IPAH) is rare with an estimated prevalence of 5.9 cases/million population.¹ Untreated, prognosis is poor with one year survival 68%.² The ESC/ERS guidelines' risk assessment tool estimates one year mortality.¹ This tool was used to assess the number of green prognostic factors and observe survival.

Methods Patients were identified retrospectively from a cohort of incident IPAH patients. Prognostic factors of WHO functional class, 6MWT and NT-proBNP were selected at 0 (baseline), 6 and 12 months. The number of green prognostic

factors at baseline was compared with 6 and 12 months and survival observed.

Results 28 patients were identified; 11 male (39%), 17 female (61%), mean age at diagnosis 65 years (range 42–85). At baseline 19 (68%) patients had no green prognostic factors compared with 12 (43%) at 6 months ($p=0.0045$) and 11 (39%) at 12 months ($p=0.002$). At baseline 8 (29%) had 1 green prognostic factor compared with 5 (18%) at 6 months ($p=0.08$) and 10 (36%) at 12 months ($p=0.17$). At baseline 1 (3%) had 2 green prognostic factors compared with 11 (39%) at 6 months ($p<0.0001$) and 7 (25%) at 12 months ($p=0.006$). No patients had 3 green prognostic factors. The number of patients with 0 red prognostic factors increased from 13 (46%) at baseline to 20 (71%) at 12 months ($p=0.005$). At one year all patients survived.

Conclusions There was a statistically significant increase ($p<0.05$) in the number of patients with two green (low risk of mortality) prognostic factors at 6 and 12 months and patients with zero red (high risk) prognostic factors at 12 months, compared with baseline. A concurrent statistically significant reduction in number of patients with no green prognostic factors was seen. These suggest decreased one year mortality. One year survival between patients with 0, 1 or 2 green prognostic factors was identical. Patients are being followed for long term survival.

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P174

A MULTICENTER, RETROSPECTIVE STUDY INTO EARLY MORTALITY IN ACUTE PULMONARY EMBOLISM

¹NM Batt, ¹A Radford, ²K Milinis, ¹K Saraya. ¹North West Thames NHS Trust, London, UK; ²Imperial Healthcare Trust, London, UK

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Introduction and Objectives Prognostic accuracy and clinical utility of the Pulmonary Embolism Severity Index (PESI) & simplified PESI (sPESI) at predicting very early mortality (<7 days) has not been previously investigated. We use this time frame to suggest outpatient imaging could be used to confirm a suspected pulmonary embolism (PE).

Methods A retrospective chart review of adult patients (≥ 18 years), who presented to two emergency departments, January 2013 – December 2015, with symptomatic pulmonary embolism (PE) confirmed on computed tomography pulmonary angiogram was carried out. Demographic and clinical parameters were recorded. PESI and sPESI scores were calculated and grouped into classes. Patients were followed up to 90 days. The primary outcome was death at 1, 3, 7, 30 and 90 days.

Results Two hundred and eighty eight patients were eligible for inclusion. Mean age was 63 years (SD 18) and 51% were male. Twenty-two patients died during the follow-up period. PE was attributed to the cause of death in 59%. There was a significant correlation between PESI risk classes (I to V) and death at 3, 7, 30 and 90 days ($p<0.01$) but not day 1. No deaths occurred in the low risk sPESI class and no deaths occurred in PESI Class III. The discriminatory ability for each study end-point expressed as the area under the ROC curve was high (AUROC ≥ 0.8 , $p<0.001$) for both PESI and sPESI.

Conclusion This findings of this study supports the use of PESI scoring systems in predicting early mortality. Study data suggests that sPESI has non-inferior predictive properties compared to the PESI, and therefore may prove of higher utility in day-to-day clinical practice. These tools may be reliably used to consider outpatient management of patients with PE, which includes imaging up to 72 hours after A&E attendance.

Abstract P174 Table 1

	Day 1	Day 3	Day 7	Day 30	Day 90
PESI					
Class I (%)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Class II (%)	0 (0)	0 (0)	1 (1.8)	1 (1.8)	2 (3.5)
Class III (%)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Class IV (%)	0 (0)	0 (0)	2 (4.3)	3 (6.4)	5 (10.6)
Class V (%)	1 (1.8)	3 (5.3)	7 (12.3)	14 (24.6)	15 (26.3)
<i>p</i> value	0.735	0.024	0.001	<0.001	<0.001
sPESI					
Low risk	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
High risk	1 (0.5)	3 (1.6)	10 (3.5)	18 (9.7)	22 (11.8)
<i>p</i> value	0.648	0.271	0.012	<0.001	<0.001
PESI					
AUROC	0.9	0.9	0.82	0.86	0.84
sPESI					
AUROC	0.9	0.89	0.86	0.9	0.88

% – Percentage of mortality within the PESI class. AUROC – area under receiver operating characteristic

P175 BURDEN OF CEREBRAL INFARCTS IDENTIFIED BY SCREENING CEREBRAL MRI SCANS IN PATIENTS WITH PULMONARY ARTERIOVENOUS MALFORMATIONS

¹G Fatania, ¹M Patel, ¹JE Jackson, ²CL Shovlin. ¹Imperial College Healthcare NHS Trust, London, UK; ²Imperial College London, London, UK

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Introduction In a recent UK study, 61/497 (12.3%) of consecutive patients with pulmonary arteriovenous malformations (PAVMs) had experienced a clinical ischaemic stroke at median 46 (range 16–82) years.¹ Conventional stroke management included antiplatelet agents, but since many PAVM patients have underlying hereditary haemorrhagic telangiectasia (HHT), there has not been a blanket recommendation to treat all PAVM patients with such agents if residual PAVMs remain after maximal treatment. The goal of this study was to evaluate evidence of silent ischemia in patients with PAVMs.

Methods Between 20/04/2009 and 02/12/2016, 43 individuals (20 males; 23 females) with known or suspected HHT underwent a cerebral MRI scan performed for the purpose of HHT cerebral AVM screening. All available scans were analysed by two independent neuroradiologists, blinded to patient demographics/PAVM status. Data were subsequently categorised and analysed using STATA IC v13 (Statacorp, Texas).

Results Patient ages ranged from 17–74 (mean 42.2) years. Twenty-two (51.1%) were known to have PAVMs demonstrable by thoracic CT scan, and 21 had PAVMs excluded by CT scan. There was no age difference between the PAVM and

non-PAVM cohorts (mean 43.3 [range 16–73] versus 41 [21–65] years respectively, $p=0.46$). No scan demonstrated a cerebral AVM, none provided evidence of prior cerebral haemorrhage, but only 22 (51.2%) of scans were reported as normal. 17 (81%) of patients without PAVMs had a normal scan, compared to 5 (22.7%) PAVM patients ($p=0.0002$). 15/21 (68.2%) PAVM patients had at least one infarct, and 6/21 (27.3%) had microangiopathic changes. The mean number of infarcts per PAVM patient was 1.58 compared to 0.14 in non-PAVM patients ($p<0.0001$). Intriguingly, while the rates of anterior circulation territory infarcts did not differ between PAVM and non-PAVM groups (patient means 0.36 and 0.14, $p=0.18$), the PAVM patients had more infarcts in posterior circulation territories (means 1.21 and 0, $p<0.0001$).

Conclusions The findings identify high rates of silent cerebral ischaemic changes in patients with PAVMs, and raise the question whether all patients with persistent PAVMs after treatment should have pharmacological stroke prevention therapy, in the absence of a clinical stroke.

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P176 INVESTIGATING ENVIRONMENTAL FACTORS ASSOCIATED WITH CEREBRAL ABSCESES IN PATIENTS WITH PULMONARY ARTERIOVENOUS MALFORMATIONS VIA AN INTERNATIONAL ONLINE QUESTIONNAIRE

¹EJ Booter, ¹SC von Widekind, ²CL Shovlin. ¹Imperial College School of Medicine, London, UK; ²Imperial College London, London, UK

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Introduction and objectives Patients with pulmonary arteriovenous malformations (PAVMs) are at high risk of cerebral abscess with life-changing morbidity and mortality. These patients often concurrently have hereditary haemorrhagic telangiectasia (HHT). A recent study of patients with PAVMs/HHT at a single institution suggested several environmental associations with cerebral abscess, particularly dental care, higher iron intake, and long-haul flights.¹ For example, 4/37 (10.8%) cerebral abscess patients reported their abscess occurred after long-distance travel.

Methods In order to capture data on wider exposure of this population to such risk factors, an online questionnaire was developed using Survey Monkey. In total, 139 non-biased questions gathered data online about an individual's HHT and/or PAVM phenotype, and environmental factors of relevance to cerebral abscess and other study foci in our group. With ethical approval (16/LO/1909), participants were recruited following advertisement through global HHT support networks.

Results The survey opened on 31 st May 2017. Within 7 weeks, 449 patients with self-reported HHT had completed the questionnaire. The majority ($\geq 60\%$) were North Americans, with Europeans constituting the second largest group. 229 (51%) had PAVMs, usually diagnosed in their twenties to fifties. 89/229 (38.9%) had been treated by PAVM embolization and 13 (5.7%) by surgery. 17 (7.42%) had experienced a cerebral abscess and 46 gave a family history of cerebral abscess. Preliminary analysis of long-distance travel data revealed most patients rarely travelled for ≥ 3 hours. 266 participants reported the number of flights they had taken in their lifetime of durations <4 hours, 4–8 hours and ≥ 8 hours.