

literature showed that CTPA Results can vary considerably depending on the clinical setting from 6.6% for patients seen in A and E, to up to 31% for patients admitted in General Medicine with mean positive yield of 18.8%. The documentation of pre-test probability was also poor (between 0% and 24%). Results from UK teaching and non-teaching hospitals were similar.

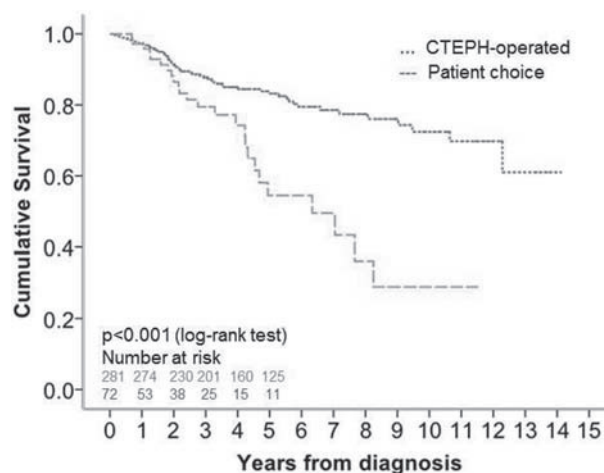
**Conclusions** Our regional clinical audit showed that our positive yield is lower than the recommended standards. We made good use of d-dimer testing when PE was suspected in patients with high pre-test probability. Adherence to current guidelines could increase the diagnostic yield and reduce costs and risks associated with CTPA scans. Extrapolated to a larger scale, this would translate into significant reduction in costs and risks associated with radiation and contrast exposure. Most of the reported clinical audits from UK hospitals revealed acceptable CTPA positive rates.

**Abstract P182 Table 1** Audit results

	d-dimers	Positive CTPA result
Low Wells score (n=183)	Tested positive: 92 (50%)	11
	Not tested: 88 (49%)	6
	Negative: 3 (0.2%)	0
High Wells score (n=53)	Tested positive: 17 (32%)	4
	Not tested: 36 (68%)	13
	Negative: 0	-
Total=236 34 (14%)		

artery disease (p=0.031) and patient choice (declining surgery) (p<0.001) were independent predictors of mortality. For patients who declined surgery a median threshold of DLco 62%, right atrial pressure 11 mmHg, and SvO<sub>2</sub>62% the positive and negative predictive values for 3 year survival were 31% and 100%, 32% and 95% and 30% and 97%, respectively.

**Conclusion** In a cohort of consecutive patients with CTEPH the long-term survival of patients undergoing PEA is excellent and superior to patients declining surgery and strongly favours surgical intervention in eligible patients. More work is required to understand factors influencing decision making in CTEPH and to ensure that patients are counselled and supported to make informed decisions.



**Abstract P183 Figure 1**

**P183 IMPACT OF PATIENT CHOICE ON SURVIVAL IN PATIENTS WITH CHRONIC THROMBOEMBOLIC PULMONARY HYPERTENSION OFFERED PULMONARY ENDARTERECTOMY**

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**Introduction** Chronic thromboembolic pulmonary hypertension (CTEPH) is potentially curable by pulmonary endarterectomy (PEA). Despite this a significant proportion of patients offered PEA decline surgery.

**Objective** To compare long term survival and prognostic indicators in patients with technically operable CTEPH who underwent PEA and those who declined surgery.

**Methods** Data were collected for consecutive, treatment-naïve patients diagnosed with CTEPH between 2001 and 2014 identified from the ASPIRE-pulmonary-hypertension-registry.

**Results** Of 588 patients with CTEPH, 368 patients were offered surgery. Seventy six percent (n=281) underwent PEA, 20% (n=72) declined surgery and 4% (n=15) were planned to undergo surgery. Five year survival was superior in patients undergoing PEA at 83% compared to patients who declined surgery at 56% (p=0.001, log-rank test). In patients who were offered surgery, mixed venous oxygen saturation (SvO<sub>2</sub>) (p=0.003), gas transfer (DLco) (p=0.042), history of coronary

**P184 AGE SHOULD NOT BE A BARRIER TO PULMONARY ENDARTERECTOMY IN CAREFULLY SELECTED PATIENTS**

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**Introduction** We previously reported that hospital survival in patients over 70 years undergoing pulmonary endarterectomy (PEA) was comparable to those under 70, albeit with longer hospital and intensive care unit (ICU) stays.<sup>1</sup> Octogenarians have acceptable morbidity and mortality outcomes following cardiac surgery. We aimed to assess if this also applies to PEA surgery.

**Methods** Consecutive patients undergoing PEA for chronic thromboembolic pulmonary hypertension (CTEPH) from June 2006 to August 2016 at the National referral centre for PEA were included in a retrospective analysis. The cohort was dichotomized into over and under 80 years according to age at surgery. Pre-operative baseline and post-operative 3–6 month follow-up data were recorded, with follow-up data included until November 2016.

**Results** 1152 individuals underwent PEA (1115 under 80 years, 37 over 80) during the study period. Baseline and 3–6 month follow up variables and outcomes are summarised in Table 1. Survival is lower in the over 80 group (Log-rank test, p=0.002), but is no different from an age and sex

Abstract P184 Table 1

	Baseline			Follow-up		
	Under 80	Over 80	P-value <sup>a</sup>	Under 80	Over 80	P-value <sup>a</sup>
<b>n</b>	1115	37				
<b>Age [median (IQR)]</b>	61 (22)	81 (2)				
<b>Gender [female (%)]</b>	46	46	NS			
<b>NYHA class [1/2/3/4 (%)]<sup>b</sup></b>	0 / 14/ 73/ 13	0/ 3/ 70/ 26	NS	28/ 47/ 23/ 1	22/ 40/ 33/ 4	NS
<b>6mwd [metres; median (IQR)]</b>	295 (190)	227 (229)	NS	363 (157)	284(101)	<b>0.001</b>
<b>mPAP [mmHg; median (IQR)]</b>	45 (15)	42 (12)	NS	25 (13)	28 (12)	NS
<b>PVR [dynes.s.cm<sup>-5</sup>; median (IQR)]</b>	666 (479)	743 (462)	NS	235 (212)	297 (294)	NS
<b>CI [L/min/m<sup>2</sup>; median (IQR)]</b>	2.18 (0.84)	2.06 (1.05)	NS	2.28 (0.69)	2.26 (0.72)	NS
<b>CAMPBOR: [median (IQR)]</b>						
Symptoms	13 (10)	12 (9)	NS	4 (8)	4 (7)	NS
Activity	11 (9)	14 (8)	NS	6 (9)	9 (6)	NS
Quality of life	11 (11)	11 (11)	NS	4 (10)	6 (8)	NS
<b>Type of surgical disease<sup>c</sup> [1/2/3/4 (%)]</b>	14/ 58/ 26/ 3	14/ 59/ 27/ 0	NS			
<b>Bypass time [min; median (IQR)]</b>	323 (65)	305 (51)	<b>0.002</b>			
<b>Arrest time [min; median (IQR)]</b>	37 (15)	33 (13)	NS			
<b>Length of stay [days; median (IQR)]</b>						
Intensive care unit	4 (3)	5 (4.5)	NS			
Total hospital	14 (10)	19 (7)	<b>0.001</b>			
<b>Concomitant surgery: Total [n (%)]</b>	129 (11)	10 (26)	NS			
CABG	76	7				
PFO/ASD	34	1				
MVR	12	0				
AVR	4	2				
<b>In-hospital mortality [n (%)]</b>	45 (4)	3 (8)	NS			
<b>Survival [%]</b>						
1 year				91.8	83.5	<b>0.002</b>
3 years				88.2	76.4	
5 years				84.4	69.4	

Baseline and follow-up variables and outcomes subdivided by age cohorts. The follow-up time for NYHA, 6MWT, haemodynamics and CAMPBOR score was 3–6 months.

<sup>a</sup>P-values were calculated using Chi-squared test or Fisher's exact test for categorical data, Wilcoxon rank-sum test for continuous data and Log-rank test for survival data. A Bonferroni adjusted significance threshold of <0.002 was used. Significant P-values are highlighted in bold. <sup>b</sup>Total percentage may not add up to 100 due to rounding <sup>c</sup>Jamieson classification.

NYHA, New York Heart Association; 6MWT, 6 minute walking test; mPAP, mean pulmonary arterial pressure; PVR, pulmonary vascular resistance; CI, cardiac index; CAMPBOR, Cambridge Pulmonary Hypertension Outcome Review score; IQR, interquartile range; CABG, coronary artery bypass graft; PFO/ASD, patent foramen ovale I atrial septal defect; MVR, mitral valve replacement; AVR, aortic valve replacement; NS, not significant.

matched UK reference population ( $p=0.5$ ) (Office of National Statistics). The hospital length of stay was longer in those over 80 (median: 19 vs. 14 days;  $p=0.001$ ), however, there was no difference in NYHA class, haemodynamics, type of surgical disease, CAMPBOR score or ICU length of stay between the two age groups. There were more concomitant cardiac surgical procedures in the over 80 group (26% vs 11%,  $p=0.006$ ), although this was not statistically significant when accounting for multiple testing.

**Conclusions** We found similar outcomes in patients under and over 80 years old undergoing PEA, except for a prolonged hospital length of stay in those over 80. Whilst survival is reduced in the over 80 group compared to the under 80, it is no different to the age-sex matched population. Age alone should not be a contraindication for PEA and individuals with suspected CTEPH should be referred for specialist evaluation.

#### REFERENCE

1. Berman M, Hardman G, Sharples L, Pepke-Zaba J, Sheares K, Tsui S, *et al*. Pulmonary endarterectomy: Outcomes in patients aged  $\geq 70$ . *Eur J Cardiothorac Surg* 2012;41(6):154–60.

## Biomarkers, imaging and outcomes in COPD

### P185 URINE BIOMARKER PROFILES ASSOCIATED WITH COPD EXACERBATIONS

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**Introduction** COPD exacerbations cause considerable morbidity and mortality. Early identification and appropriate treatment might improve patient outcomes. We sought to determine whether urinary biomarkers are associated with a COPD exacerbation.

**Method** Urine samples from paired stable and exacerbation visits from 55 subjects were available from the COPD-BEAT study. 50 biomarkers were analysed in each sample at Mologic (Mologic LTD). Biomarkers that fulfilled the criteria i) a