

# Rehabilitation for Operated Lung Cancer (ROC)

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# Rehabilitation in lung cancer surgery

- 4 studies preop rehabilitation
- 2 ▲ exercise capacity
- 2 ▲ postop predicted lung function (COPD)

2-4 weeks of peripheral ( $\pm$  inspiratory) muscle training,

No improvement in clinical outcomes

# COPD Rehabilitation Programme

- Improve their function and exercise capacity
- Reduce complications
- Enhance recovery from exacerbations.

Prevalence of COPD in lung cancer

73 % men & 53 % women

Lung cancer resection - irreversible exacerbation?

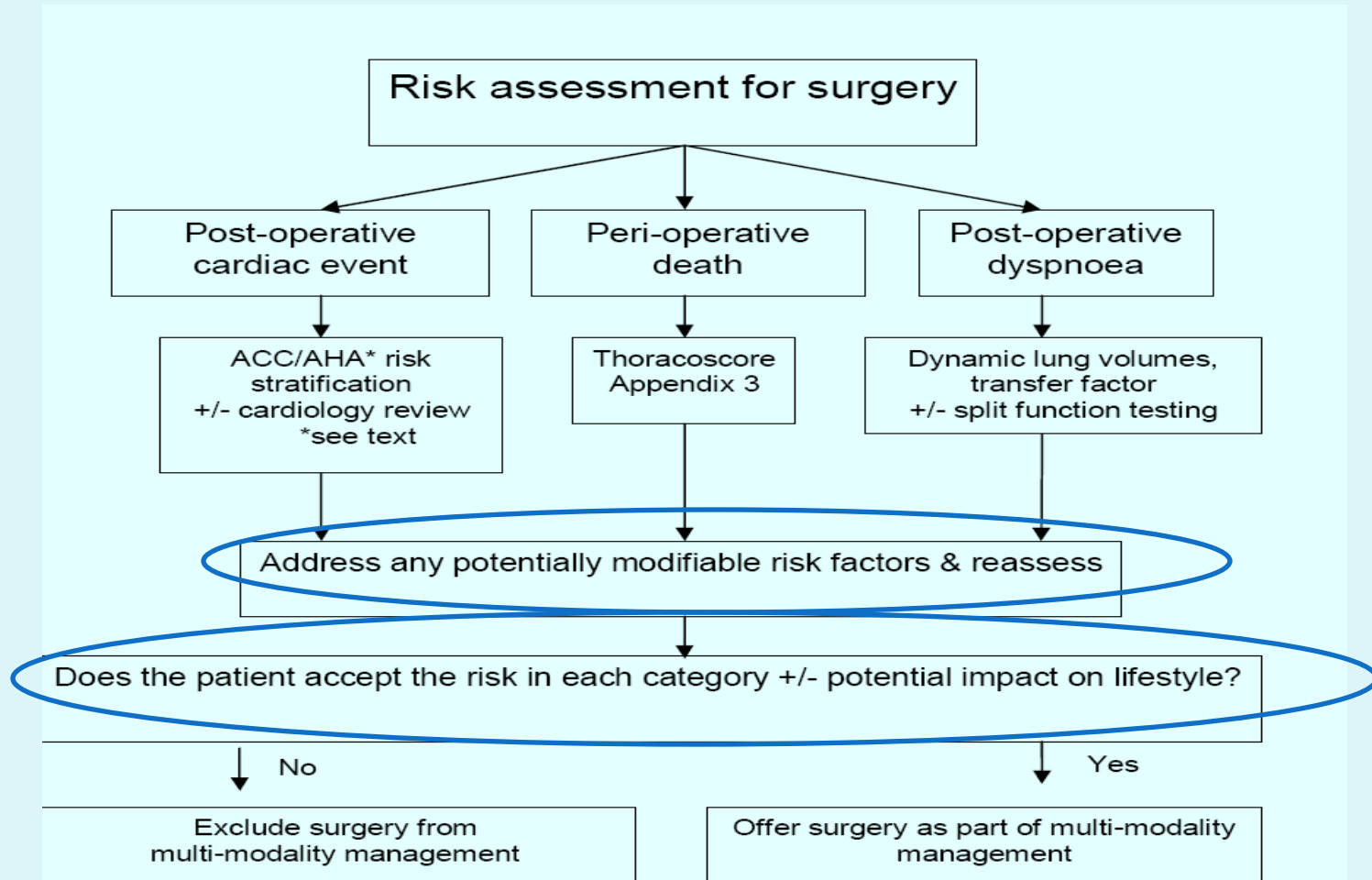
# Postoperative Pulmonary Complications (PPC) are common but so what?

<b>*=P&lt;0.001</b>	PPC group (n=77)	Non- PPC (n=325)
*Mortality	11.7% (9)	0.9% (3)
*ITU admission	19.5% (15)	2.5% (8)
*LOS (days) median (95%CI)	12 (11.8-20.4)	5 (5.6- 6.1)
*HDU (95%CI)	4 (3.7-5.5)	2 (1.8-2.1)

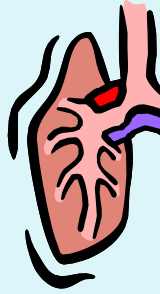
# Independent Risk Factors for PPC

	Odds Ratio	95% CI
Age $\geq$ 75	2.3	1.2-4.2
ASA $\geq$ 3	2.9	1.5-5.7
Current smoking	2.3	1.2-4.2
COPD	5.9	3.2-10.9
Reduced mobility	2.1	1.2- 3.8

# BTS guidelines Surgery permissive



# ROC



A programme identifying potential surgical candidates several weeks before surgery, optimising their physical status, preparing them for the inpatient journey and supporting their recovery after surgery

# Pilot

- Enriched Cohort study
- April 2010- December 2011
- 2 of 10 referring hospitals sites
- The rest are controls
- Pragmatic – surgery not delayed
- Local Adaptation
- Complex (bundle) Intervention



# Main elements of ROC

Pulmonary Rehabilitation

Smoking Cessation

Patient Self management and Education

Nutritional Intervention

# Method

Patient identified in the multi disciplinary meeting as potential surgical candidate for curative lung resection pending final investigations

Written and verbal information given by Lung Cancer Nurse Specialist/Respiratory Consultant

Patient attends Rehabilitation sessions twice a week until surgery (surgery is not delayed)

Self management Education programme

Dietary assessment and advice, referral if needed

Smoking cessation- identify and direct to relevant service

# Outcomes

## Primary:

- PPC
- Length of stay (+HDU/ITU)
- Re-admission rate

## Secondary:

- Exercise capacity
- Pulmonary function
- Smoking cessation
- Nutrition assessment (BMI)
- Quality of Life

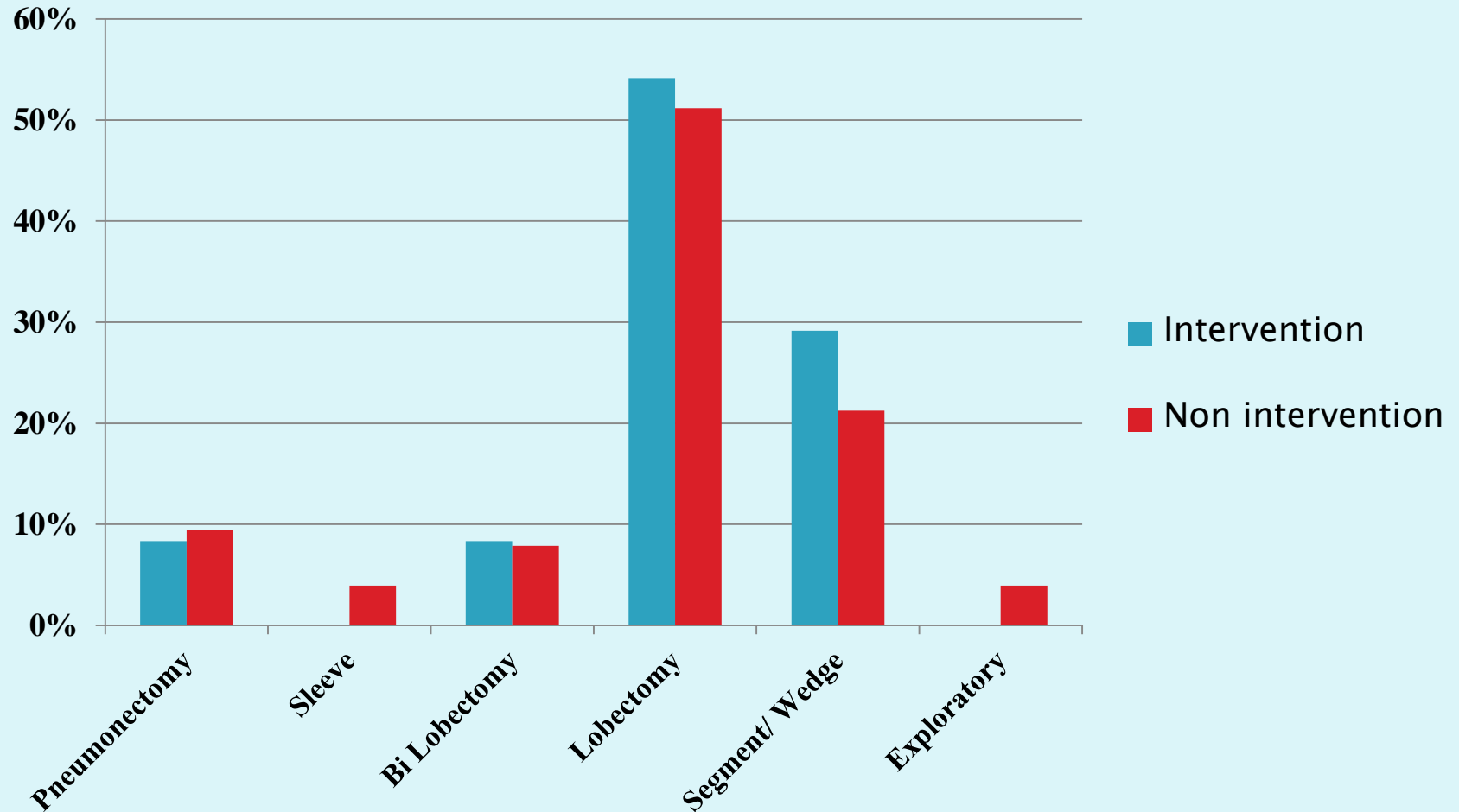
# Recruitment up to date

- 32 intervention and 148 non-intervention patients
- 3 drop out
  - 2 disease related
  - 1 non disease drop out
- 6 (1-13) preoperative rehabilitation sessions attended
- 7 (4-10) preoperative education sessions attended

# Demographics

Characteristic	Intervention (n=29)	Non Intervention (n=138)
Age*	69 ± 6	65 ± 12
Mild COPD	38%	37%
Severe COPD	3%	5%
Cardiac disease	34%	36%
BMI	27 ± 5	28 ± 4
Current smokers	17%	18%
ECOG ≥3	16%	18%
ASA ≥3	33%	35%
Thoracoscore	2.5%	2.6%

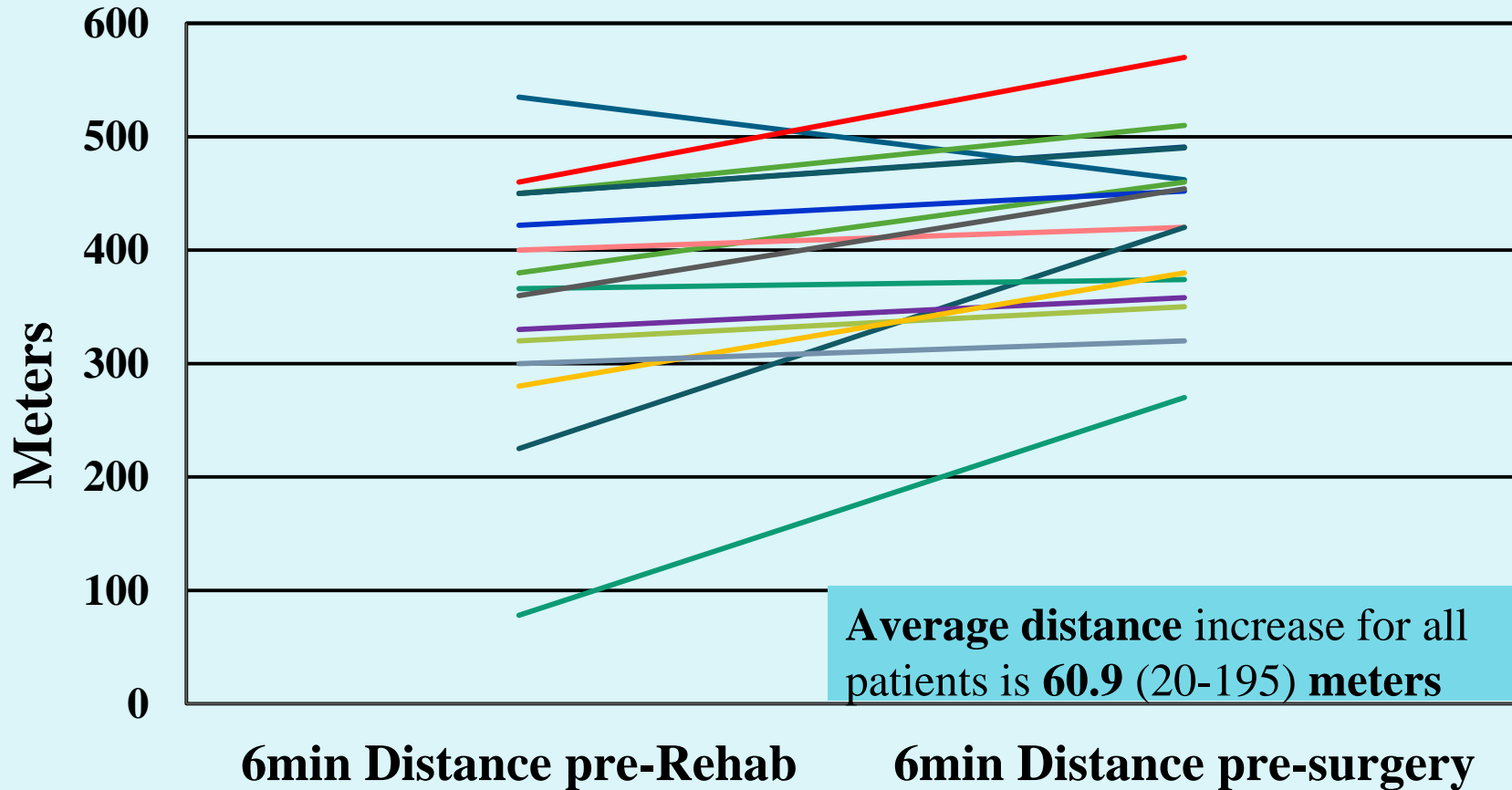
# Types of surgery



# Primary outcomes

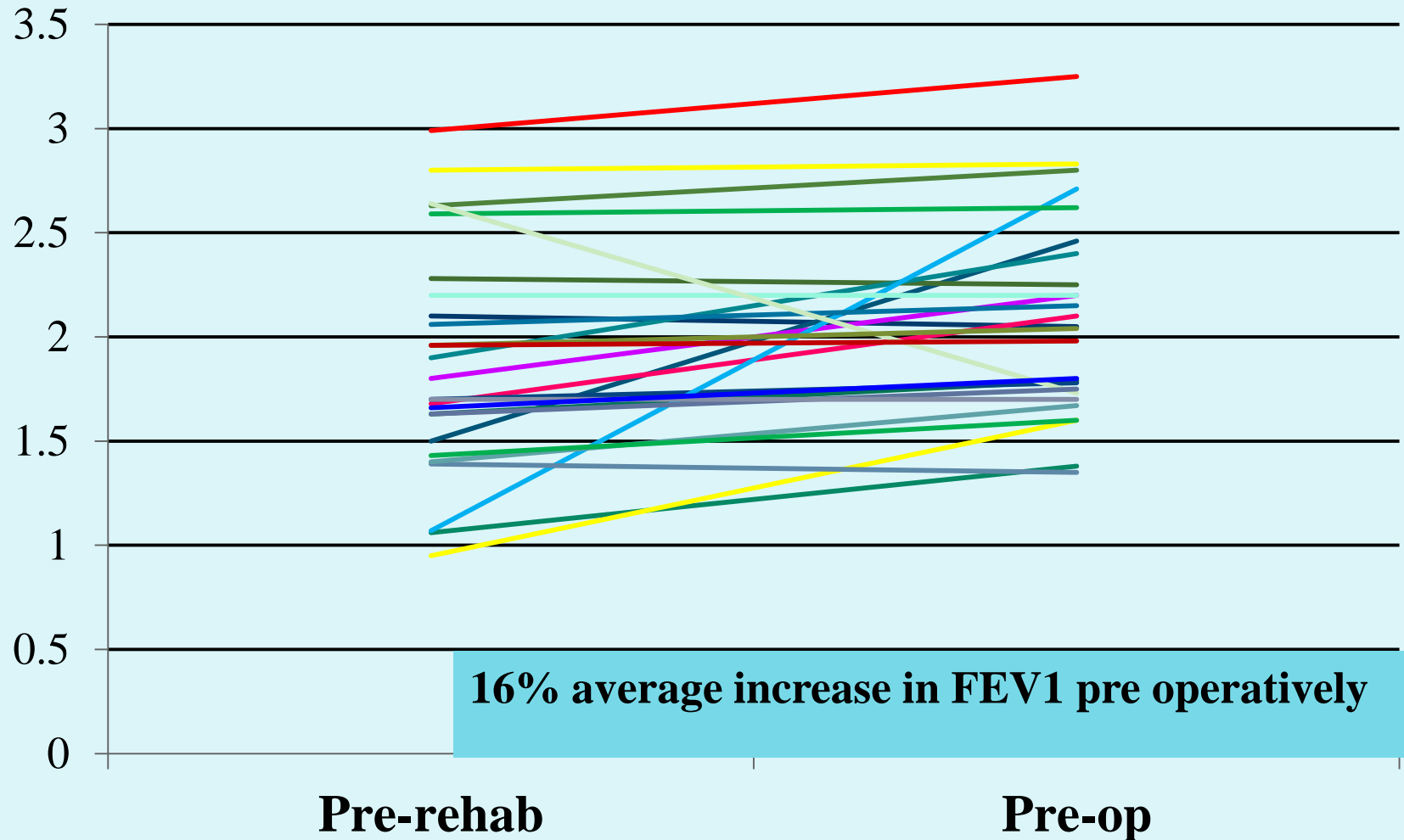
*= $p < 0.005$	Intervention (n=29)	Non-Intervention (n=138)
<b>* PPC Rate</b>	<b>7%</b>	<b>18%</b>
<b>*Readmission rate</b>	<b>8%</b>	<b>15%</b>
ITU admission rate	3 % (1)	2% (3)
HDU median LOS	1	2
Median Hospital LOS	4	5

# 6 minutes walk distance

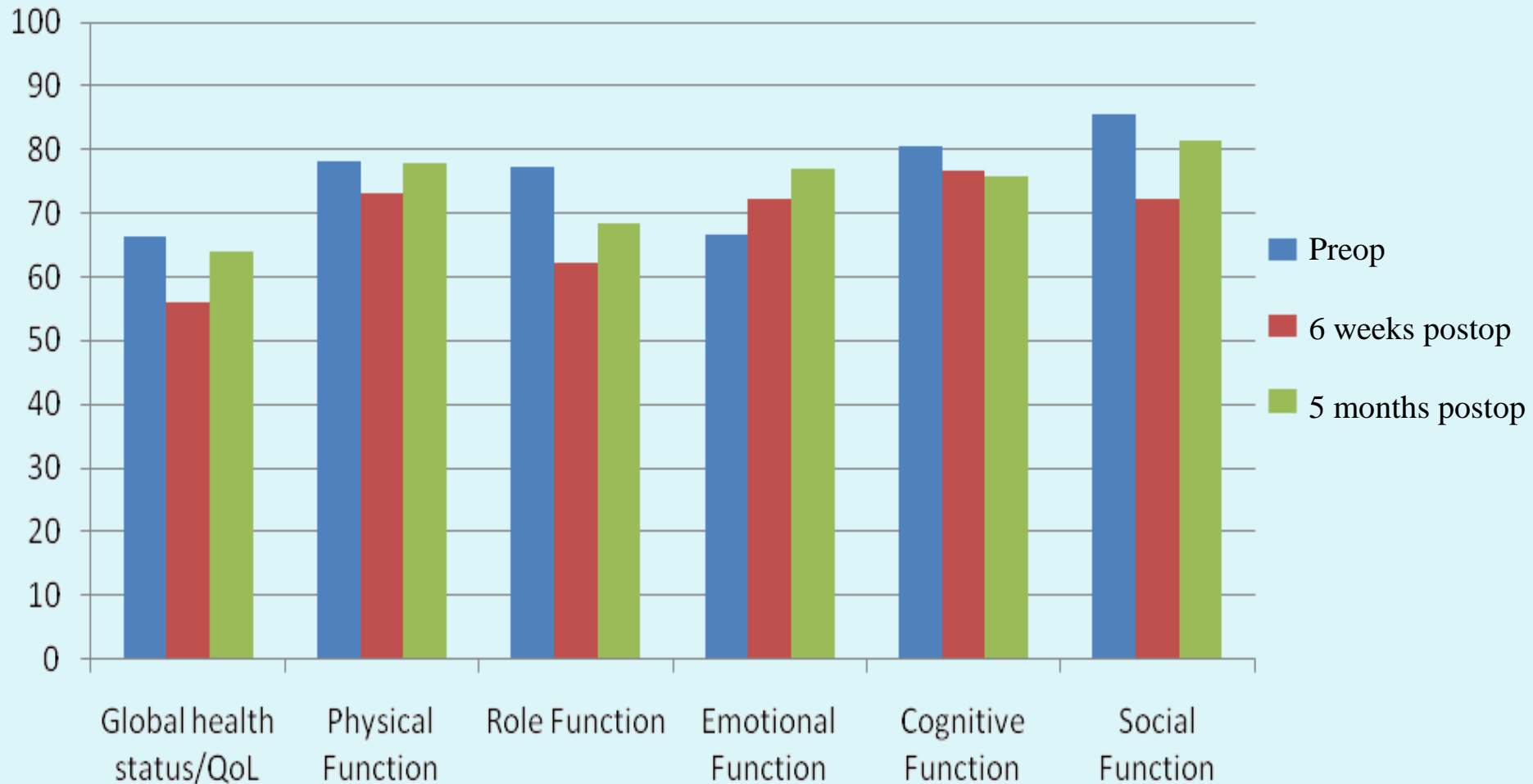




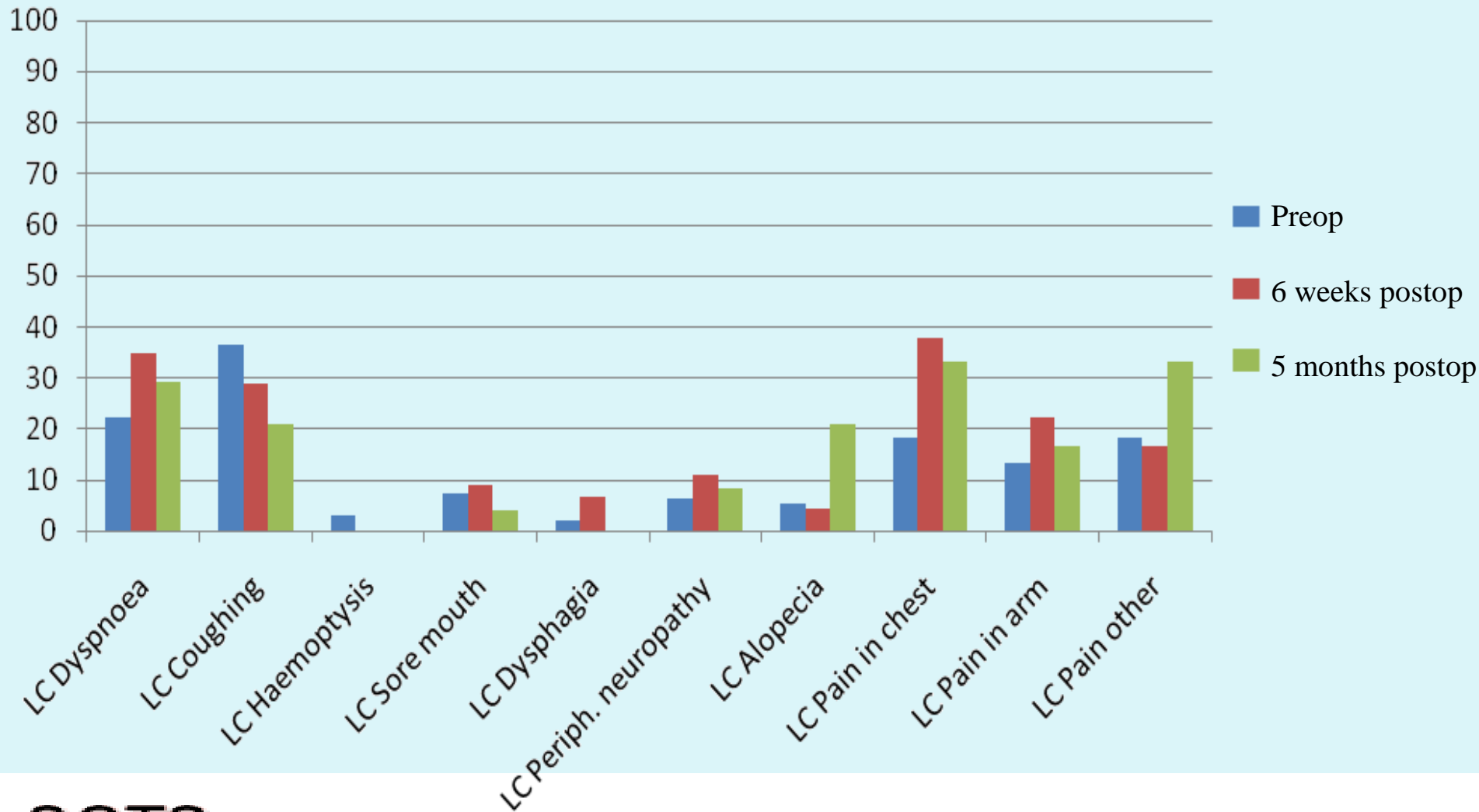
# Pulmonary function



# QOL: Function scores



# Lung cancer specific symptom scores



# Where do we go from here?

A Rehabilitation programme for operated lung cancer

Is viable

Early Results are promising

Multi centre RCT

# Acknowledgement

## **Research Nurse**

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Paula Agostini

Helen Beadle

Stuart Lightfoot

Anita Clarke

Rebecca Jenkins

Johanna Harvey

Libby Brace

## **Smoking cessation nurse**

Claire Gallagher-Tinsley

## **Steering Group**

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Paul Aveyard

Sally Singh

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Rahul Mukherjee

Kate Duffield

County Bernie

## **Macmillan Dietician**

Amanda Irwin

## **Other**

Amanda Parsons

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# Rehabilitation in lung cancer surgery

Author, date, Study type	Patient Group/ Intervention	Outcomes	Key Results	Comments
<b>Jones et al</b> (2007) Cancer Feasibility study	N=20 Surgeons discretion 3 wk cycle (x5/wk)	Exercise capacity 13/20	VO <sub>2</sub> max ↑ 2.4ml/kg/mt (1.0-3.8; p=0.002) 6MWT test i ↑40mts (16-64; p=0.003)	Selection criteria not clear The reason for drop out in patients not stated
<b>Bobbio et al</b> (2008) EJCTS Feasibility study	N=12 COPD (VO <sub>2</sub> max <15) 4wk IMT(IS)+PMT(x5/wk)	Exercise capacity 11/12	Vo <sub>2</sub> max ↑2.8ml/kg/mt 13.5 ±1.3 vs 16.3±1.9 p< 0.001	PPC rate is 8/11 (73%) Delayed surgery
<b>Sekine et al</b> (2005) JapCTVS Historic case control	N= 22 (05) vs 60 (95-99) COPD 2 wk IMT(IS)+5000 steps (x5wk)	PPO FEV1  LOS	Actual : predicted FEV1 was better in rehab (p=0.047) 29±9 vs 21±7 days	LOS long in both groups Historic controls
<b>Weiner et al</b> (1997), JTCV , Prospective RCT	N=32 COPD 2 wk IMT (IS) (x6/wk) Post op 3/12	PPC rate PPO FEV1 at 3/12	2/17 vs 2/15. Lob +570ml vs -70mls Pneumo +680ml vs -110mls	No difference in PPC rate

# Melbourne Group Scale (MGS)

- 4 of 8 factors indicate PPC.

<b>Variables</b>
Chest x-ray atelectasis /infiltration
Purulent sputum
Physician diagnosis of pneumonia/chest infection
Temperature $>38^{\circ}\text{C}$
Oxygen saturation $<90\%$ on air
Positive signs on sputum microbiology
White cell count $>11.2$ units
Readmission/prolonged stay ITU/HDU