ANEXOS

ETAPAS		LUGAR	DURACIÓN	PERSONAL
1	***Planificación del trabajo y grupo de investigación***	Servicio Anestesia y Reanimación del H.U.M.S (SAR-HUMS)	2-3 semanas	2 Investigadores principales (IP).
2	***Protocolo de investigación***	SAR-HUMS	4 semanas	2 IP. 5 Investigadores colaboradores (IC).
3	***Reclutamiento de pacientes***	Consulta de Unidad de Cardiotorácica del SAR-HUMS	9 meses *(18/08/2016-18/04/2017)*	Unidad de Cardiotorácica 1 Anestesiólogo. 1 Enfermero.
4	***Toma de muestras***	Servicio Neumología y Bioquímica del H.U.M.S	9 meses	2 Médicos. 2 Enfermero. 2 Auxiliar de enfermería.
5	***Seguimiento perioperatorio anestésico y quirúrgico***	Quirófano de Cirugía Torácica	9 meses	1 Anestesiólogo. 3-4 Enfermeros. 1 Auxiliar de enfermería.
6	***Obtención de resultados***	SAR-HUMS	5 semanas	2 IP. 5 IC.
7	***Análisis estadístico***	SAR-HUMS	2 semanas	5 IC. 1 Técnico informático.
8	***Discusión y conclusiones***	SAR-HUMS	3 semanas	2 IP. 4-5 IC.
9	***Revisión final***	SAR-HUMS	1 semana	2 IP.

Tabla 1. Resumen del Contexto del estudio: marco, lugares, fechas relevantes y personal requerido.

Independent risk factors for ALI
Peak inspiratory pressure
> 40 cm H_2O
Plateau pressure
> 29 cm H_2O
Excessive perioperative fluid infusion
Pneumonectomy
Preoperative alcohol abuse
Other risk factors described in the literature
Smoking
Diabetes
COPD
Prolonged OLV (> 100 min)
Extended lung resection
Right pneumonectomy
Impaired lymphatic drainage
Transfusion
Aspiration
Infection
Oxidative stress and ischemia/reperfusion injury

ALI = acute lung injury; COPD = chronic obstructive pulmonary disease; OLV = one-lung ventilation

Figura 1. Factores de riesgo de la lesión pulmonar aguda post-toracotomía. Editada con permiso de Brassard et al [2014] (5).

ASA 1	A normal healthy patient
ASA 2	A patient with mild systemic disease
ASA 3	A patient with severe systemic disease
ASA 4	A patient with severe systemic disease that is a constant threat to life
ASA 5	A moribund patient who is not expected to survive without the operation
ASA 6	A declared brain-dead patient whose organs are being removed for donor purposes

Figura 2. Clasificación del Estado Físico de la American Society of Anesthesiologists (ASA). Editada con permiso de Kupeli E. et al. [2017] (91).

Risk Factor	Risk Score
Age, years	
≤ 50	0
51-80	3
> 80	16
Preoperative O_2 saturation	
≥ 96%	0
91%-95%	8
≤ 90%	24
Respiratory infection in the last month	17
Preoperative anemia, hemoglobin ≤ 10 g/dL	11
Surgical incision	
Upper abdominal	15
Intrathoracic	24
Duration of surgery	
≤ 2 hours	0
2-3 hours	16
> 3 hours	23
Emergency surgery	8
Risk class, No. of points in risk score (pulmonary complication rate)	
Low	< 26 points (1.6%)
Intermediate	26-44 points (13.3%)
High	> 44 points (42.1%)

Figura 3. Índice de Riesgo respiratorio en pacientes quirúrgicos en Cataluña (ARISCAT): Factores de riesgo independientes de complicaciones pulmonares postoperatorias. Editada con permiso de Kupeli E. et al [2017] (91).

Modalities \ Stages		Two-lung Ventilation (Pre-OLV)	OLV	Selective lung re-expansion	Two-lung Ventilation (Post-OLV)	Emergence	Post extubation
FiO_2	*Fraction*	1.0	**0.4-0.8**	0.21	0.5	0.5	0.5
PEEP	*cm H_2O*	3-10	**3-10**		3-10	3-10	
SaO_2	%		**92-96**		92-96	92-96	92-96
Tidal volume	*mL·kg^{-1} of IBW*[a]	6-8	**4-6**		6-8 (4-6)[c]	spontaneous	
Respiratory Rate	*Breaths·min^{-1}*	10	**14-16**		10-14	spontaneous	
I:E ratio		1:2	**1:2**[b]		1:2		
Peak / Plateau pressure	*cm H_2O*	30/20	**30/20**	PIP 30 (20)[c]	30/20		
Ventilatory mode		VCV PCV	**VCV PCV**	Manual[d]	VCV PCV	PSV[g]	NIV[h]
Recruitment		Post intubation	**At beginning of OLV and as needed**		As needed[f]		

a: See Table 4 for tidal volume according to ideal body weight; *b*: Adjust ratio to minimize inspiratory pressure in restrictive lung disease (1:1-2:1) or prevent auto-PEEP in COPD patients (1:4-1:6); *c*: If lung resection, limit applied peak pressure to 20 cmH_2O; *d*: With the use of an auxiliary circuit; *e*: If lung resection, limit tidal volume and adjust respiratory rate; *f*: Consider that operative lung has a very compliant thoracic environment; *g*: Following chest closure; *h*: In patients at high risks for ALI or as needed

ALI = acute lung injury; COPD = chronic obstructive pulmonary disease; F_iO_2 = fraction of inspired oxygen; I:E = inspiratory:expiratory ratio; IBW = ideal body weight; NIV = noninvasive ventilation; OLV = one-lung ventilation; PCV = pressure-controlled ventilation; PEEP = positive end-expiratory pressure; PIP = peak inspiratory pressure; PSV = pressure-support ventilation; SaO_2 = oxygen saturation; TLV = two-lung ventilation; VCV = volume-controlled ventilation

Figura 4. Manejo clínico de la Ventilación Unipulmonar (VUP) paso a paso.

Editada con permiso de Brassard et al [2014] (5).

Trastorno obstructivo		Trastorno restrictivo	
American Thoracic Society		***American Thoracic Society***	
	FEV1		*FVC*
Leve	> 70%	Leve	> 70%
Moderada	60-69%	Moderada	60-70%
Moderadamente grave	50-59%	Moderadamente grave	50-60%
Grave	35-49%	Grave	34-50%
Muy grave	< 35%	Muy grave	< 34%
SEPAR		**SEPAR**	
	FEV1		*TLC*
Leve	> 65%	Leve	70-80%
Moderada	50-65%	Moderada	60-70%
Grave	35-50%	Grave	< 60%
Muy grave	< 35%		

Figura 5. Clasificaciones de la gravedad de la patología respiratoria de tipo obstructivo y tipo restrictivo, según los principales organismos internacionales (American Thoracic Society y Sociedad Española de Neumología y Cirugía Torácica [SEPAR]). Editada por García de Vinuesa et al. [2010] (54).