

# ECMO in Cancer Patients

RENCONTRE EVELINE MARKIEWICZ - 18<sup>ème</sup> ÉDITION

URGENCES ET COMPLICATIONS SÉVÈRES CHEZ LE PATIENT CANCÉREUX

CRAPANZANO MINICHELLO VANES

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*Dpt. of Intensive Care*

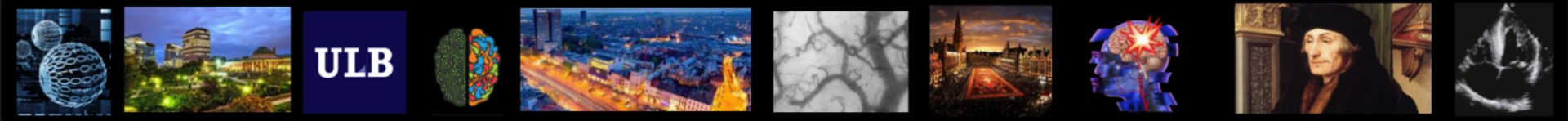
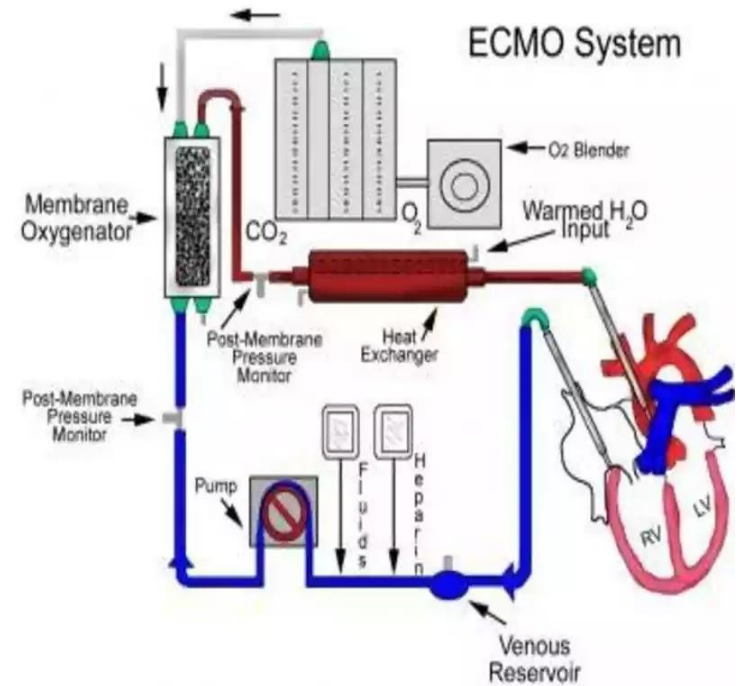
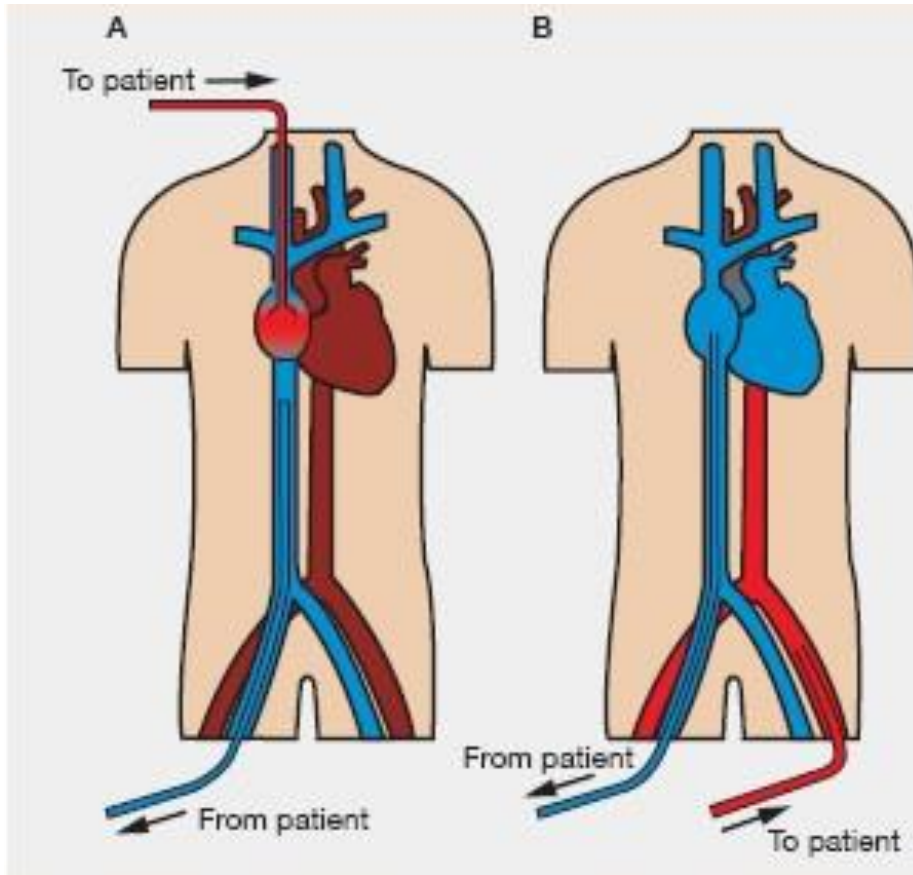
*Hôpital Erasme – ULB*

*Brussels (BE)*





# ECMO

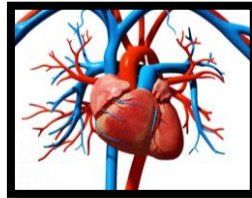




## Extracorporeal life support (ECLS)

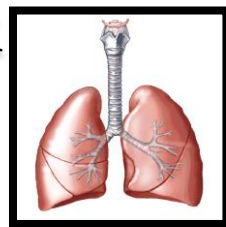
### Cardiac ECLS

- VA-ECMO
- LA-ECMO
- V-PA ECMO
- ECPR



### Respiratory ECLS

- VV-ECMO
- V-PA ECMO
- AV-ECCO<sub>2</sub>R
- VV-ECCO<sub>2</sub>R



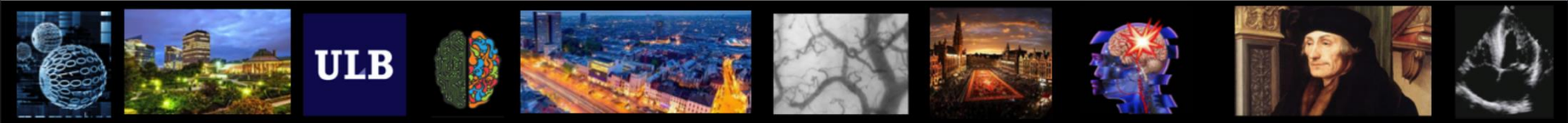


## Overall Outcomes

	Total Runs	Survived ECLS	Survived to DC or Transfer
<b>Neonatal</b>			
Pulmonary	26,719	22,394 83%	19,252 72%
Cardiac	7,266	4,727 65%	2,987 41%
ECPR	1,613	1,089 67%	666 41%
<b>Pediatric</b>			
Pulmonary	8,287	5,608 67%	4,812 58%
Cardiac	9,593	6,620 69%	4,941 51%
ECPR	3,615	2,078 57%	1,508 41%
<b>Adult</b>			
Pulmonary	13,712	9,174 66%	8,040 58%
Cardiac	12,566	7,181 57%	5,222 41%
ECPR	3,995	1,572 39%	1,144 28%
<b>Total</b>	<b>87,366</b>	<b>60,443 69%</b>	<b>48,572 55%</b>



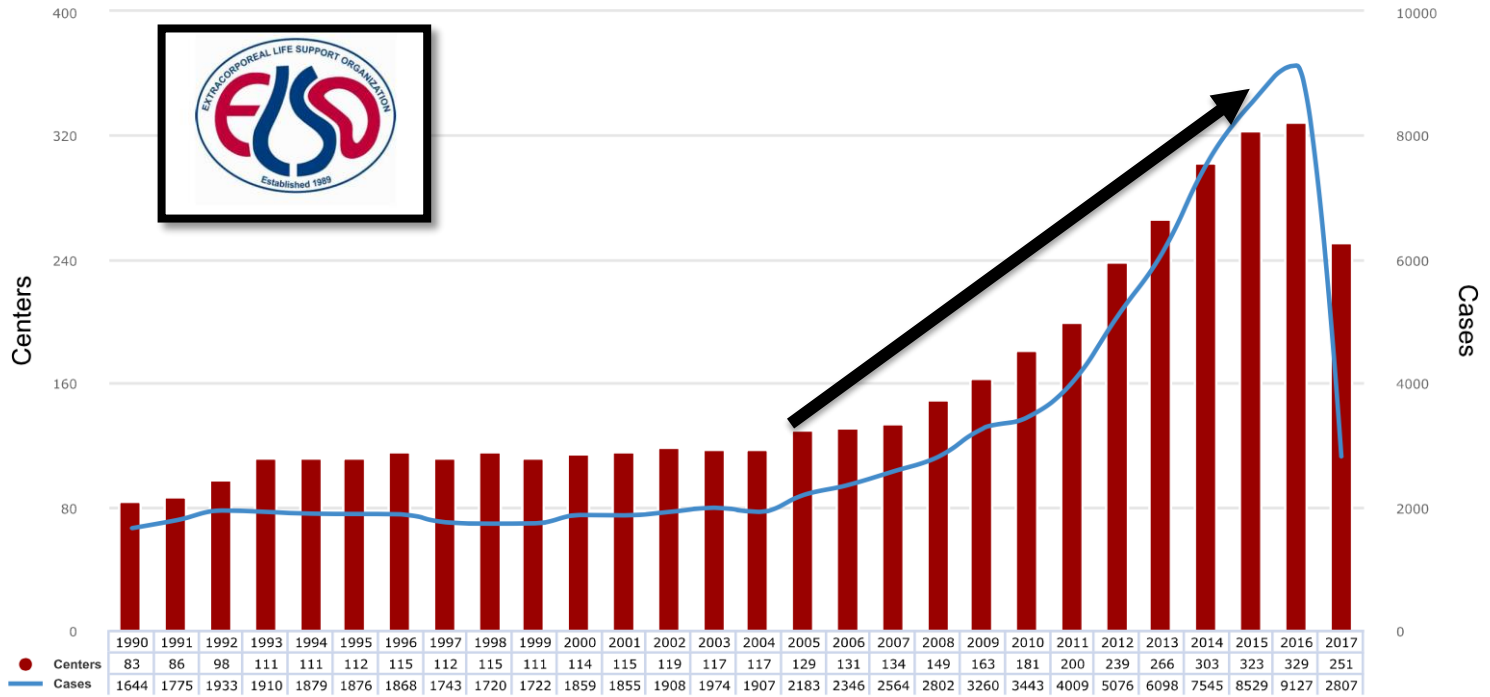
*July 2017*



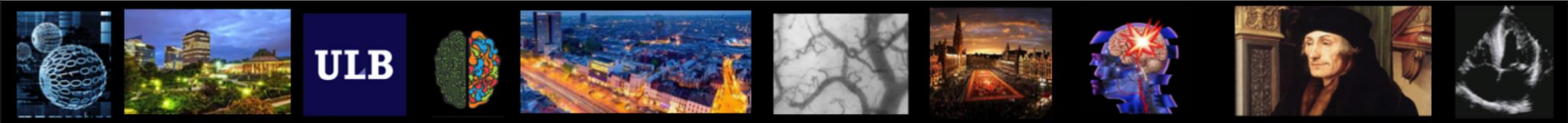


## Centers

Centers by year

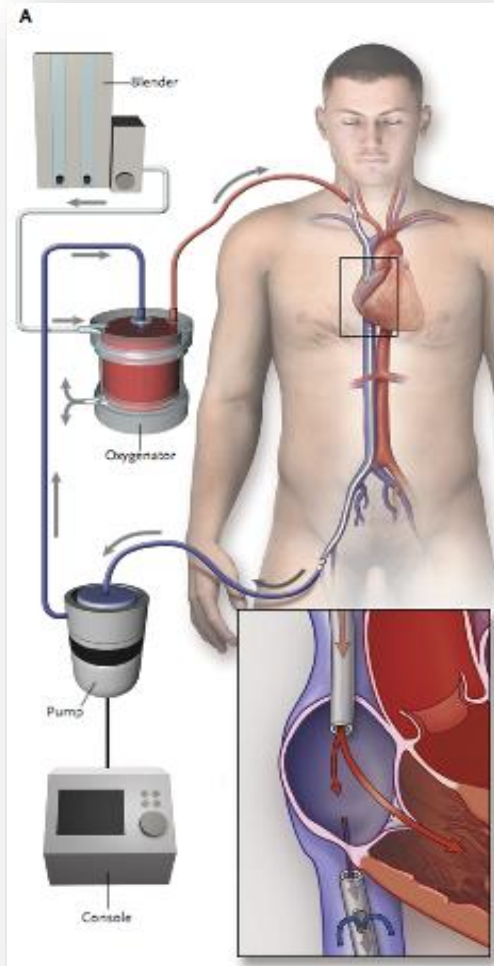


July 2017

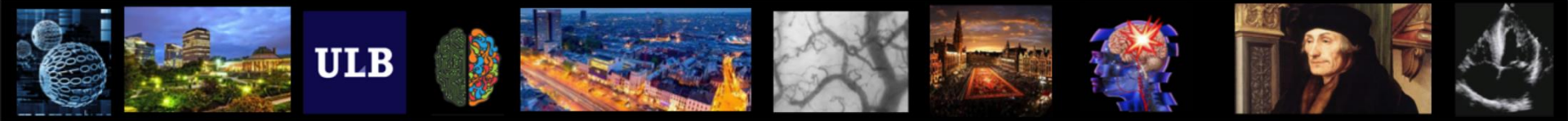




## INDICATIONS



- *Hypoxemic Respiratory Failure*
- *Lung Transplantation*
  - *Bridge to Tx*
  - *Surgery*
  - *PGD*
- *Trauma*
- *Interventional procedures*
- *Obese patients with severe respiratory failure (to promote spontaneous breathing)*



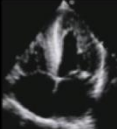
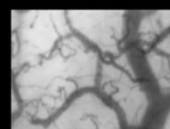




- ARDS
- Aspiration/Smoke inhalation
- Pneumonia
- Alveolar hemorrhage
- Alveolar proteinosis

## LUNG RECOVERY

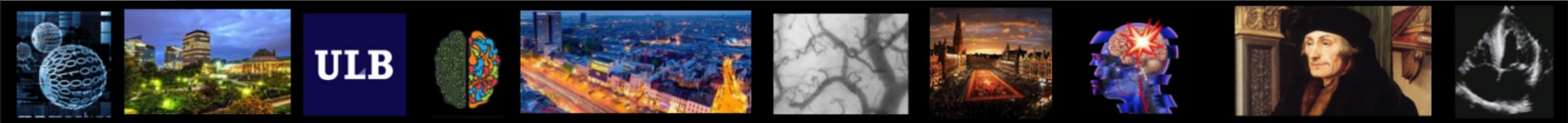
- Status asthmaticus \*
- Pulmonary contusion





- First successful implantation of **ECMO** by Robert Bartlett in 1972 (motor vehicle accident with severe respiratory failure)
- Used commonly at several **specialized hospitals** for the treatment of infants and, less frequently, for adults with respiratory or cardiac failure in 70-90
- Its use in adults remained **controversial** for some time due to lower survival rates
  - **1974 (Zapol)**: 90 patients, 42 of them treated with VA-ECMO – High Ppl<sub>t</sub> and low PEEP with low RR and high V<sub>t</sub>; 9 days of MV to ECMO – RBCT: 2.5 L/day – 90% of mortality in both groups
  - **1994 (Morris)**: 40 patients treated with low-flow ECMO and PCIRV, no “lung rest” – large inexperience – RBCT 2.7 L/day – Mortality: 67% ECMO vs. 56% CTRL

**ECMO devices have markedly evolved – MV has improved**







**ELIGIBLE PATIENTS**  
 Severe potentially reversible HRF  
 • *Murray*  $\geq 2.5$   
 • *High PaCO<sub>2</sub> / pH*  $\leq 7.2$   
 Age: 18-65 yrs  
 High Pplt / FiO<sub>2</sub>  $\leq 7$  days  
 No ICH, CI to UFH  
 No Limitation of therapy

**REGISTRATION**  
 Referring ICU physician confirms:  
 • *Patients is eligible*  
 • *Beds available*

**RANDOMIZATION**  
 Patient is eligible  
 Consent  
 Prognostic factors  
 Central Phone Randomization  
 Allocation  
 If necessary, arrange transport

Efficacy and economic assessment of conventional ventilatory support versus extracorporeal membrane oxygenation for severe adult respiratory failure (CESAR): a multicentre randomised controlled trial

*Giles J Peek, Miranda Mugford, Ravindranath Tiruvoipati, Andrew Wilson, Elizabeth Allen, Mariamma M Thalany, Clare L Hibbert, Ann Truesdale, Felicity Clemens, Nicola Cooper, Richard K Firmin, Diana Elbourne, for the CESAR trial collaboration*



**180** randomized patients (90 vs. 90) out of 766 over 5 years (2001-2006) in 69 centers

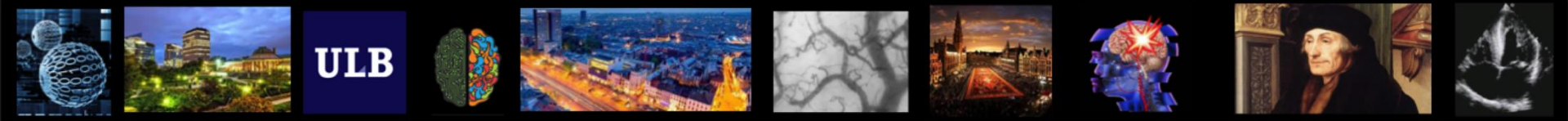
**90** ECMO patients (12 hours of optimized MV)  
 • 68 underwent ECMO (“LUNG REST”)  
 • 22 not treated (24%)

- 16 = Improvement
- 3 = Death before transport
- 2 = Death during transport
- 1 = Amputation

**Mortality 18%**



Leicester

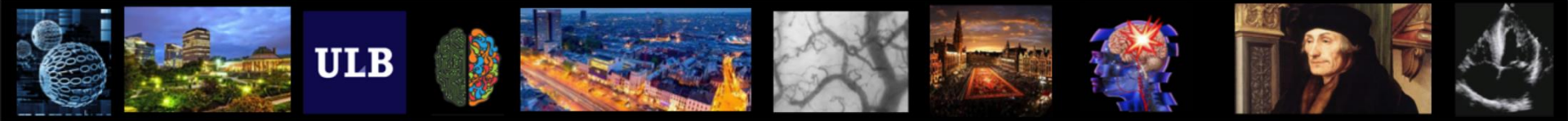
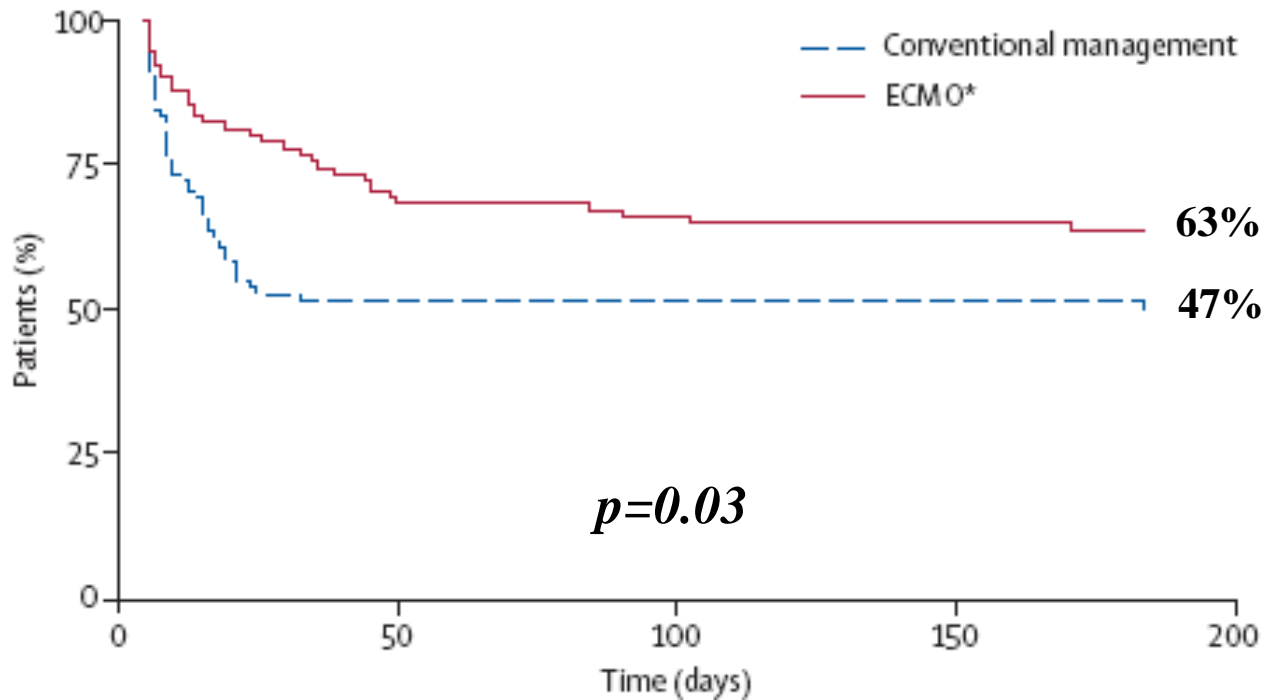




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**PRIMARY OUTCOME**  
(free from death or major disability)

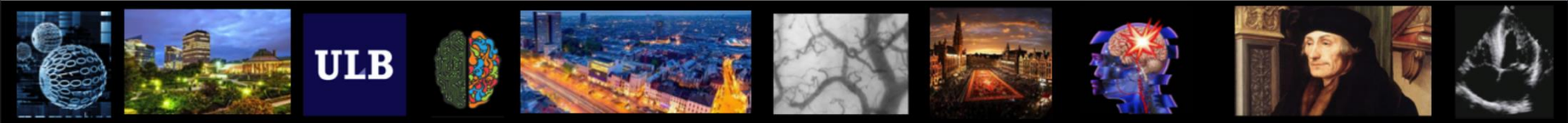




## Efficacy and economic assessment of conventional ventilatory support versus extracorporeal membrane oxygenation for severe adult respiratory failure (CESAR): a multicentre randomised controlled trial

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- Difference in **mortality** was not significant ( $p=0.07$ )
- In **PP analysis**, difference became even less significant
- Long **recruitment** period (mortality of ARDS changed)
- Expected mortality in the CTRL group of 70% (too high?)
  - ✓ *“conventional centers” provided poor ARDS management?*
- System with **ONE or FEW** dedicated centers = not generalizable !!!!
- What about “adverse events”???







Several **case-series** reporting survival rate  $> 60\%$  in severe ARDS patients on ECMO, while overall mortality in the same condition without ECMO was estimated  $< 35\%$

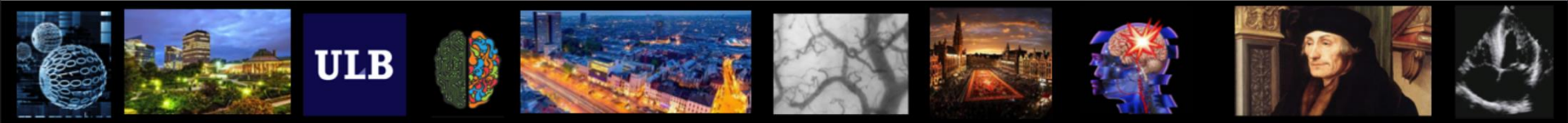
*Lewandoski, ICM 1997; Linden, ICM 2000; Mols G, Am J Surg 2000; Ullrich, Am Thorac Surg 1999; Kolla, Am Surg 1997; Bartlett, Clin Chest Med 2000*

## Critical Care Services and 2009 H1N1 Influenza in Australia and New Zealand

*N Engl J Med 2009;361:1925-34.*

The ANZIC Influenza Investigators\*




- **722** patients admitted to the ICUs; 462 (64%) treated with MV; 14% mortality
- **68** patients (15%) treated with VV-ECMO (PF 56-PEEP 18); 71% survival





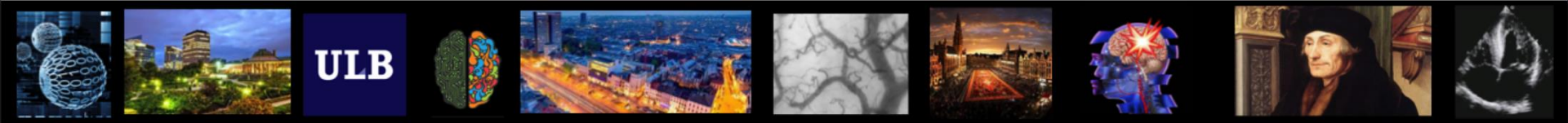
## Extracorporeal Membrane Oxygenation in Severe Influenza Infection with Respiratory Failure: A Systematic Review and Meta-analysis

Table 3: Key procedural details and outcomes

Study	VV ECMO (%)	Pre-ECMO MV Median (days)	Pre-ECMO PaO <sub>2</sub> /FiO <sub>2</sub> ratio	Median (days)			Mortality (%)
				ECMO duration	MV	ICU LOS	
Kutleša, 2014	100	2	58	8	NA	NA	35
Michaels, 2013	46	3.5	62	9.8	NA	21	40
Pham, 2013 	87	2	63	11	28	33	36
Weber-Carstens, 2013 	NA	2.6	87	NA	32	33	54
Roncon-Albuquerque, 2012	90	9.3	69	22	32	36	60
Takeda, 2012	100	5	50	8.5	NA	NA	65
Beutel, 2011	100	NA	85	10	19	NA	48
Forrest, 2011	94	2	57	10	NA	36	19
Noah, 2011	84	4	55	9	NA	NA	29
Patroniti, 2011 	98	2	63	10	18	22	32
Schellongowski, 2011	80	NA	56	13	17	21	50
Holzgraefe, 2010	92	1	53	16	NA	NA	8
Davies, 2009	93	2	56	10	18	27	29

**13 studies (n=494 patients)** – overall use of ECMO was **42%** and mortality was **37%** (significant heterogeneity) - Duration of ECMO was 10 days; of MV was 19 days

2017 Annals of Cardiac Anaesthesia





## Acute Respiratory Distress Syndrome With and Without Extracorporeal Membrane Oxygenation: A Score Matched Study

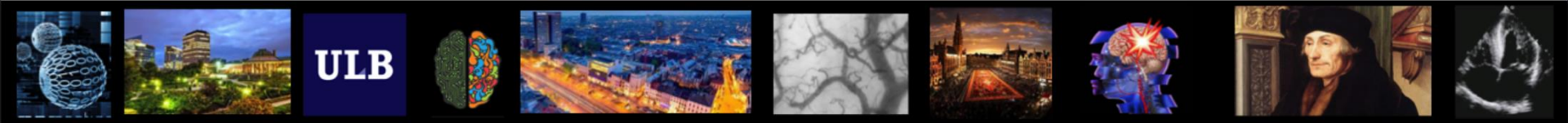
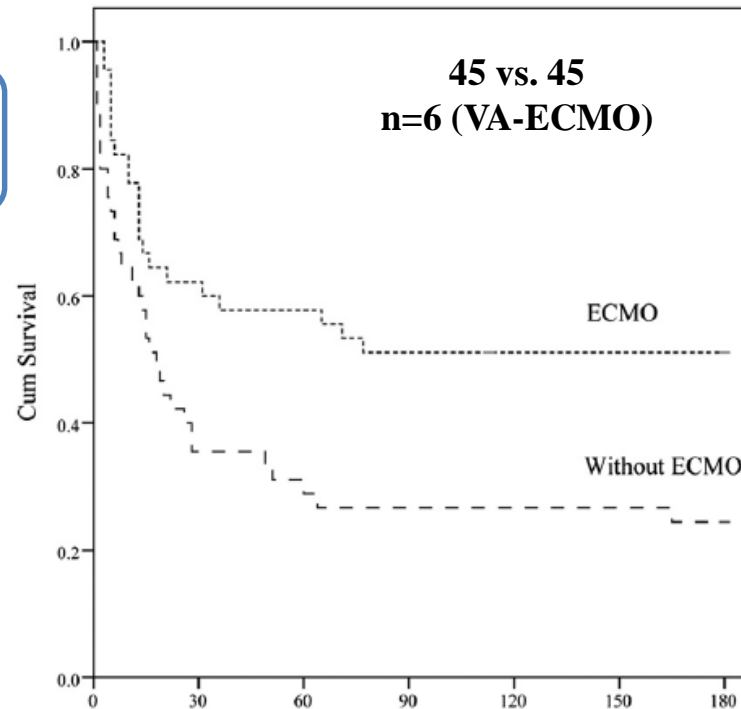
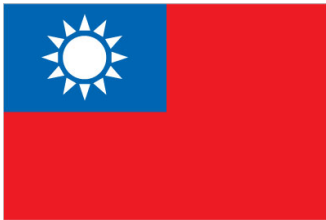
Ann Thorac Surg 2015

Hsiao-Chi Tsai, MD,\* Chih-Hsiang Chang, MD,\* Feng-Chun Tsai, MD, Pei-Chun Fan, MD, Kuo-Chang Juan, MD, Chan-Yu Lin, MD, Huang-Yu Yang, MD, Kuo-Chin Kao, MD, Ji-Tseng Fang, MD, Chih-Wei Yang, MD, Su-Wei Chang, PhD, and Yung-Chang Chen, MD

N=216

Survival Functions

- APACHE II score
- Age







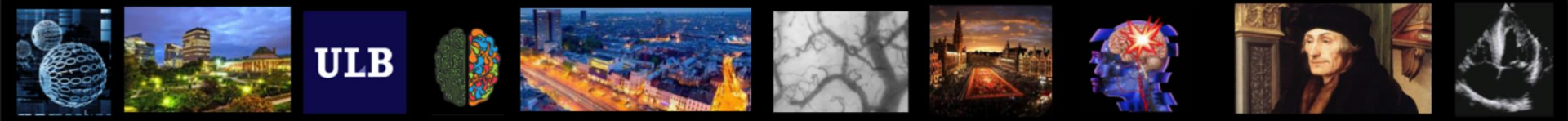
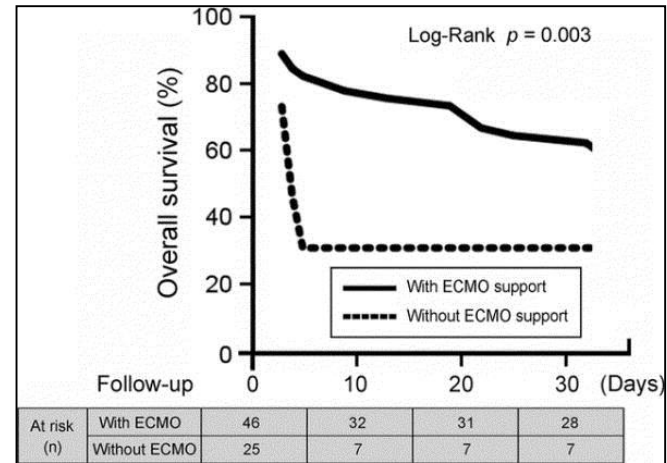
## Extracorporeal Life Support for Cardiogenic Shock or Cardiac Arrest Due to Acute Coronary Syndrome

Shingo Sakamoto, MD, Norimasa Taniguchi, MD, Shunsuke Nakajima, MD, and Akihiko Takahashi, MD

Departments of Cardiology and Cardiac Surgery, Sakurakai Takahashi Hospital, Hyogo, Japan

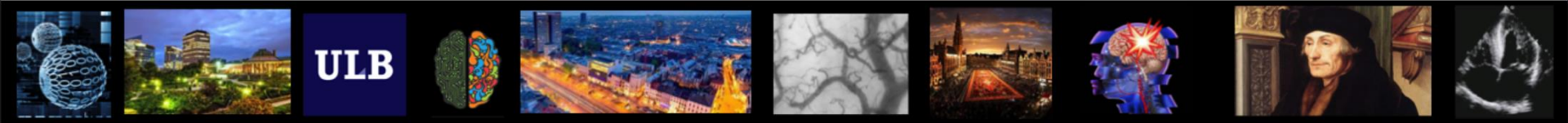
- N=98 (34% cardiogenic shock)
- 55% were weaned from ECLS
- ECLS-related complications occurred in 36%
- All-cause in-hospital mortality rate was 67%

*Sheu, CCM 2010*





- **Cardiac arrest (in- and out-of hospital)**
- **Refractory cardiogenic shock due to acute myocardial infarction (AMI)**
- **AMI mechanical complications (VSD, LVFWR)**
- **Post-cardiotomy syndrome**
- **Massive pulmonary embolism**
- **Decompression of decompensated end-stage dilated cardiomyopathy**
- **Acute myocarditis**
- **Support for interventional procedures**

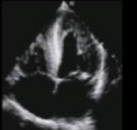
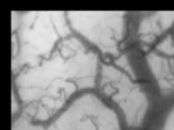




The ELSO's suggestion:



*“.....ECMO initiation should be considered in hypoxic respiratory failure when the risk of mortality is 50% or greater.....”*

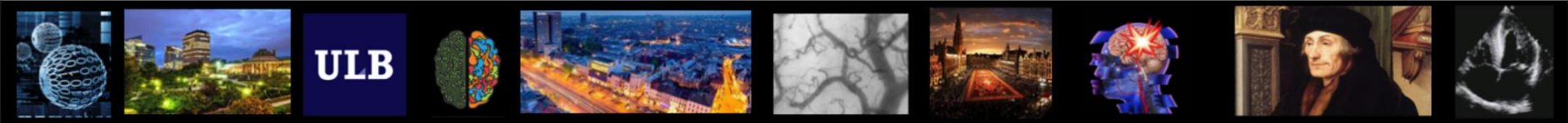
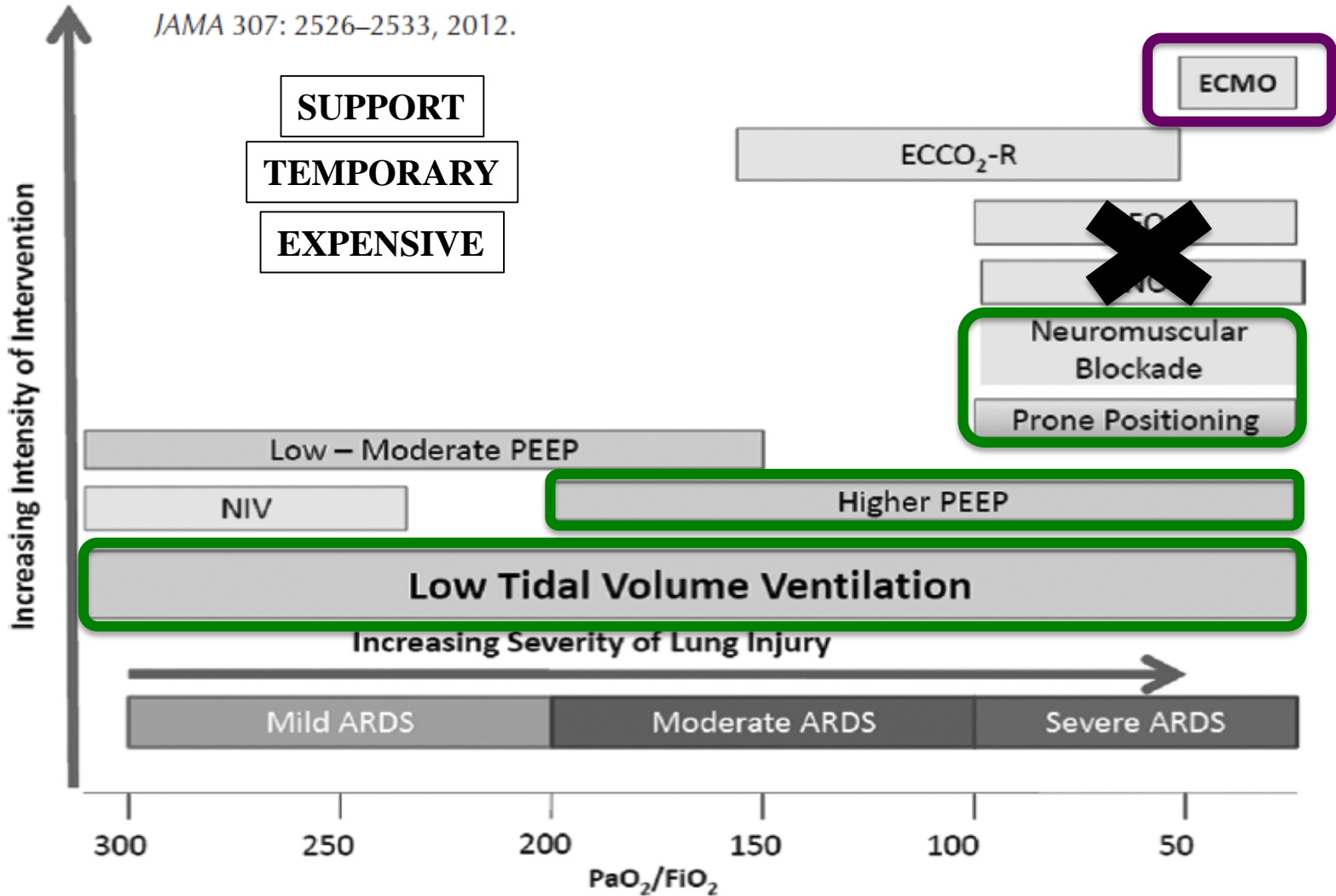




# VV-ECMO: HRF - Selection



JAMA 307: 2526–2533, 2012.

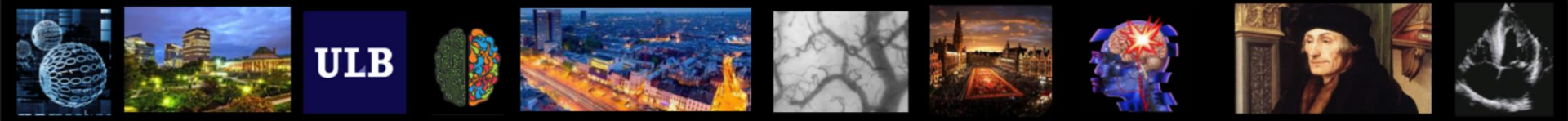




## B. Contraindications

There are no absolute contraindications to ECLS, as each patient is considered individually with respect to risks and benefits. There are conditions, however, that are known to be associated with a poor outcome despite ECLS, and can be considered relative contraindications.

1. Mechanical ventilation at high settings ( $FiO_2 > .9$ ,  $P_{plat} > 30$ ) for 7 days or more
2. Major pharmacologic immunosuppression (absolute neutrophil count  $< 400/ml^3$ )
3. CNS hemorrhage that is recent or expanding





Hôpital  
Erasmus

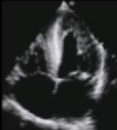
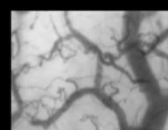


ULB

- **$\text{PaO}_2/\text{FiO}_2 < 80$  and  $\text{FiO}_2 > 80\%$  with  $\text{PEEP} > 10-15$   $\text{cmH}_2\text{O}$  and  $\text{Pplat} > 30$   $\text{cmH}_2\text{O}$**
- **$\text{pH} < 7.25$  and  $\text{PaCO}_2 > 55$  mmHg for 2 hours together with severe hypoxemia**
- No response to **recruitment** manoeuvres or **PP**
- Reversible or potentially treatable **cause**
- Duration of **MV**  $< 10$  days
- Absence of **CI**s
- **Age**  $< 75$  years

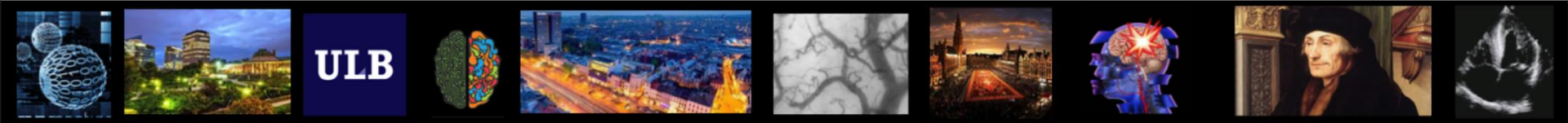


ULB





- **Irreversible disease**
- More than **two chronic organ dysfunctions** (lungs excluded)
- **Malignant and/or terminal illness**
- **Refusal of blood products**
- **Chronic severe pathologies**
  
- Intracranial bleeding \*
- **Major contra-indications for anti-coagulation \***
- ETI and MV > 7 (10) days \*
- **Low platelets count (<50,000/mm<sup>3</sup>) \***
- Age > 80 years\*







De Rosa et al. *BMC Anesthesiology* 2014, 14:37  
<http://www.biomedcentral.com/1471-2253/14/37>



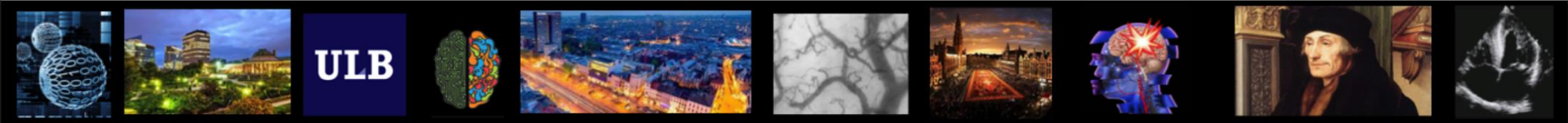
## CASE REPORT

Open Access

### Extra Corporeal Membrane Oxygenation (ECMO) in three HIV-positive patients with acute respiratory distress syndrome

Francesco Giuseppe De Rosa<sup>1†</sup>, Vito Fanelli<sup>2†</sup>, Silvia Corcione<sup>1</sup>, Rosario Urbino<sup>2</sup>, Chiara Bonetto<sup>2</sup>, Davide Ricci<sup>3</sup>, Mauro Rinaldi<sup>3</sup>, Giovanni Di Perri<sup>1</sup>, Stefano Bonora<sup>1</sup> and Marco V Ranieri<sup>2</sup>

- *Several case reports in HIV patients (PCP)*
- *Diffuse Alveolar Hemorrhage*
  - *Wegener's granulomatosis*
  - *SLE vasculitis*
  - *Polyarteriitis nodosa, Microscopic polyangitis*
  - *Thrombocytopenia*





- *Endotracheal Tumor resection / Brocho-oesophageal fistula*
- *Pneumectomy*
- *Bleomycin lung toxicity*
- *Bridge to chemotherapy (teratoma; B- or T-lymphoma)*
- *Bridge to airway stenting and Rx-therapy*
- *Severe Tumor Lysis and ARDS*
- *Post major lung resection (7/63 pts) \**

*Dunkman, A A Case Rep 2017*

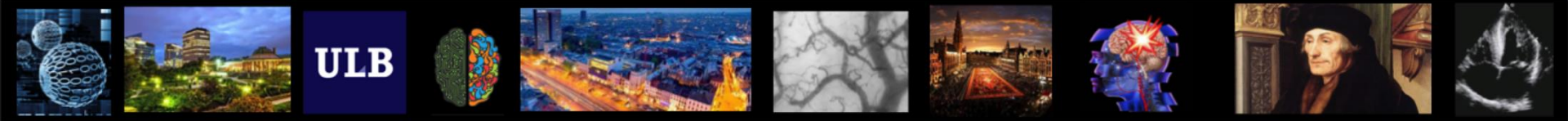
*Shah, Innovations 2017*

*Chung, Cancer Res Treat 2017*

*McLenon, Ann Thorac Surg 2016*

*Sanford, Pediatric Blood Cancer 2016*

*Jung, Thorac Cancer 2017 \**



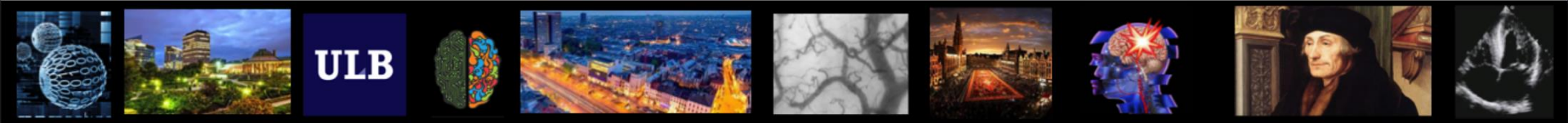


Matthieu Schmidt  
 Elie Zoghbeï  
 Hadrien Rozé  
 Xavier Repesse  
 Guillaume Lebreton  
 Charles-Edouard Luyt  
 Jean-Louis Trouillet  
 Nicolas Bréchet  
 Ania Nieszkowska  
 Hervé Dupont  
 Alexandre Ouattara  
 Pascal Leprince  
 Jean Chastre  
 Alain Combes

## The PRESERVE mortality risk score and analysis of long-term outcomes after extracorporeal membrane oxygenation for severe acute respiratory distress syndrome

Intensive Care Med 2013

Characteristic	All patients (n = 140)	Status at 6 months post-ICU		p-Value
		Alive (n = 84)	Dead (n = 56)	
Immunocompromised <sup>a</sup>	43 (31)	14 (17)	29 (52)	<0.0001
Hematological malignancies	13 (9)	3 (4)	10 (18)	
Solid tumor	10 (7)	2 (2)	8 (14)	
Solid organ transplantation	8 (6)	4 (5)	4 (7)	
High-dose or long-term CS/IS	8 (6)	3 (4)	5 (9)	
Human immunodeficiency virus	4 (3)	2 (2)	2 (4)	





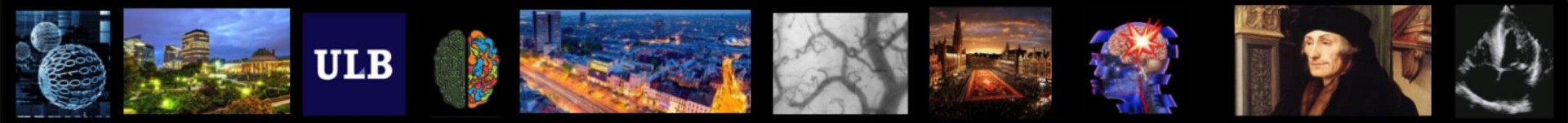
- Cardiogenic shock for pheocromocytoma
- Bridge-to-decision in systemic light-chain amyloidosis
- Cardiac Lymphoma
- Toxoplasma myocarditis < BMT
- Fulminant myocarditis < 5-FU
- Massive pulmonary embolism

*Bouabdallaoui, Asian Cardiovasc Thorac Ann 2017*

*Amraotkar, Tex Heart Inst J, 2016*

*Allain, Eur J Cardiothorac Surg 2015*

*Hadem, Clin Res Cardiol 2006*







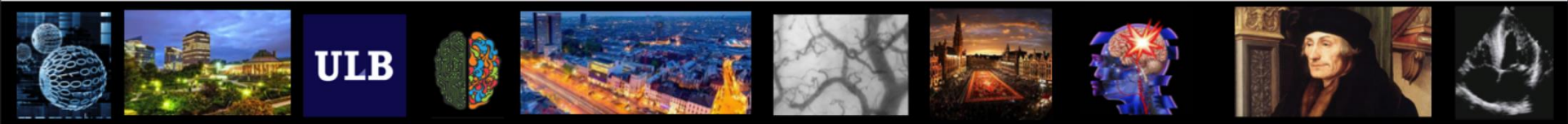
## Extracorporeal life support for adults with malignancy and respiratory or cardiac failure: The Extracorporeal Life Support experience

American Journal of Surgery (2010)

- 72 adult (>21 yrs) patients
- **Solid**, n= 47 (65%); **Hematologic**, n=21 (29%)
- Respiratory ECMO, n=54 (75%), 18 Cardiac ECMO (n=8 ECPR)

ECLS Indication	Cancer Patients (Survival to Discharge)	Other Adults <sup>†</sup> (Survival to Discharge)	<i>P</i>
Respiratory support	26% (n = 14/54)	51% (n = 798/1,558)	.0003
Cardiac support	70% (n = 7/10)	34% (n = 333/979)	.0579
ECPR	100% (n = 2/8)	27% (n = 91/340)	1.0
All	32% (n = 23/72)		

Indications?



# ECMO: Cancer patients

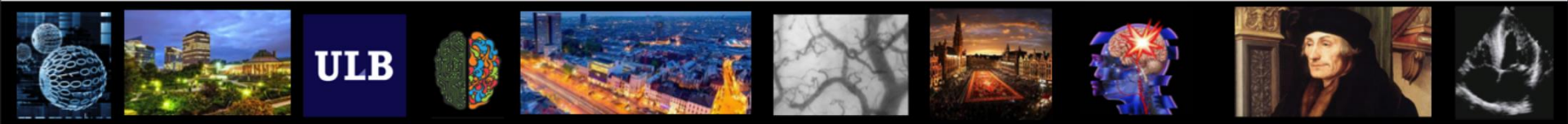


Patient no.	Disease	Therapy status (days posttherapy)	Etiology of ARF	APACHE II score	LIS	ECMO days	Bleeding	Outcome	Cause of death
1	PHG	-	Pneumonia	8	2.5	-	Minor	Died	Sepsis
2	MDS	Danazol	PAP	11	2.5	-	Major	Died	Pneumonia
3	HLH	Induction on ECMO	Pneumonia	14	3	3	-	Died	Pneumonia
4	AML	Allo SCT (30)	Pneumonia	31	2.5	5	Major	Died	Pulmonary hemorrhage
5	AML	Allo SCT (420)	Pneumonia	17	2.25	28	-	Died	Pneumonia
6	PMF	Allo SCT (84)	Pneumonia	22	2	13	-	Died	RV failure
7	MM	Chemotherapy (55)	Pneumonia	15	3	27	-	Died	Sepsis
8	HD	Chemotherapy (22)	Pneumonia	16	2.5	8	-	Died	Sepsis
9	AML	Induction (10)	RAS	13	2	2	Major	Died	Pulmonary hemorrhage
10	AML	Allo SCT (2,190)	Pneumonia	17	2.5	3	-	Died	Pneumonia
11	AML	Allo SCT (1,735)	Pneumonia	22	3	9	-	Died	Sepsis
12	AML	Allo SCT (417)	Pneumonia	13	2	1	-	Died	MOF
13	AML	Induction (22)	Pneumonia	16	2.25	8	Major	Died	Pulmonary hemorrhage
14	AML	Allo SCT (73)	Pneumonia	13	2.5	5	-	Died	MOF
15	ALL	Induction (27)	Pneumonia	32	2.25	7	-	Died	Sepsis

Severe Hemorrhage



*Kang, Korean J Internal Med 2015*



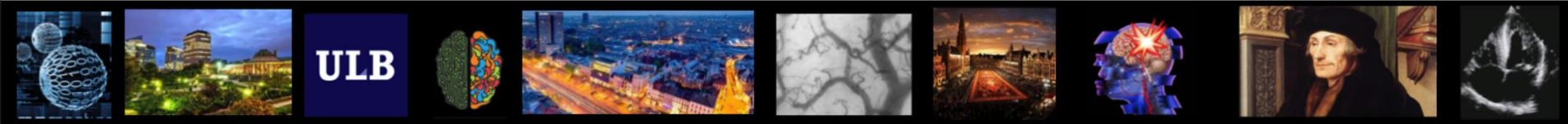


## Extracorporeal membrane oxygenation in adult patients with hematologic malignancies and severe acute respiratory failure

*Critical Care* 2014, **18**:R20

Philipp Wohlfarth<sup>1</sup>, Roman Ullrich<sup>2</sup>, Thomas Staudinger<sup>1</sup>, Andja Bojic<sup>1</sup>, Oliver Robak<sup>1</sup>, Alexander Hermann<sup>1</sup>, Barbara Lubczyk<sup>2</sup>, Nina Worel<sup>3</sup>, Valentin Fuhrmann<sup>4</sup>, Maria Schoder<sup>5</sup>, Martin Funovics<sup>5</sup>, Werner Rabitsch<sup>1</sup>, Paul Knoebl<sup>1</sup>, Klaus Laczika<sup>1</sup>, Gottfried J Locker<sup>1</sup>, Wolfgang R Sperr<sup>1</sup>, Peter Schellongowski<sup>1\*</sup> and Arbeitsgruppe für hämato-onkologische Intensivmedizin der Österreichischen Gesellschaft für Internistische und Allgemeine Intensivmedizin und Notfallmedizin (ÖGIAIN)

- 2000-2013; 541 pts with hematological malignancies
- 368 (68%) on mechanical ventilation - 14 treated with ECMO (3.8%)
- Median age = 32 (22-51) years
- VV-ECMO 11 (79%)
- Vasopressors 14 (100%)
- RRT 5 (36%)
- Thrombocytopenia 11 (79%)



# ECMO: Cancer patients



Wohlfarth, Crit Care 2014

Leukocytes: 2.1 (1.8 – 2.5)

P/F: 60 (53 – 65)

Plt: 35 G/L (26-51)

Patient number	Malignancy	Therapy status (days since therapy)	Etiology of ARF	SAPS II	LIS	ECMO days	Bleeding	ICU and hospital outcome
1	CNS NHL	Chemotherapy (51)	Pneumonia	45	3.7	9	Minor	Died
2	Hodgkin lymphoma	Allo SCT (111)	Pneumonia	34	3.3	28 <sup>b</sup>	Major	Died
3	ALL	Consolidation (13)	Abdominal sepsis	78	2.3	4 <sup>c</sup>	VA -	Alive
4	ALL <sup>a</sup>	Induction on ECMO	TRALI	62	3.3	3	-	Alive
5	Burkitt lymphoma	Induction (16)	Pneumonia	63	3.8			
6	ALL	Allo SCT (31)	Pneumonia	39	3.5			
7	Hodgkin lymphoma	Allo SCT (33)	Pneumonia	65	3.3			
8	ALL	Allo SCT (203)	Pneumonia	68	3.3			
9	DLBCL	Induction on ECMO	Pneumonia	102	4.0			
10	Multiple myeloma	Auto SCT (789)	Pneumonia	43	3.7	9	Major	Alive
11	Anaplastic T-cell NHL <sup>a</sup>	Induction on ECMO	Pneumonia	46	3.0	25 <sup>d</sup>	Major	Alive
12	DLBCL <sup>a</sup>	Induction on ECMO	NHL	36	3.3	3 <sup>c</sup>	VA -	Alive
13	AML	Consolidation (34)	Pneumonia	48	3.3	34	Major	Died
14	DLBCL <sup>a</sup>	Induction on ECMO	NHL	56	2.3	4 <sup>d</sup>	VA -	Alive

Follow-up (36 months):

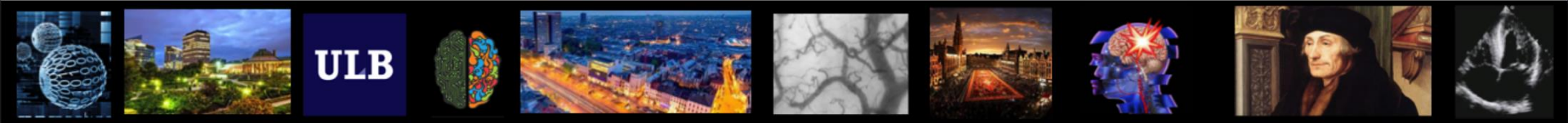
- All 7 survivors alive
- 6 remission
- 1 relapse

Chemotherapy on ECMO

51 (42-65)

3.3 (3.3-3.7)

7/14 (50%)





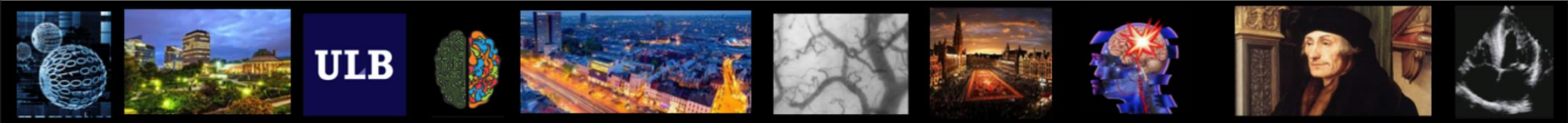


## Characteristics and Outcome of Patients After Allogeneic Hematopoietic Stem Cell Transplantation Treated With Extracorporeal Membrane Oxygenation for Acute Respiratory Distress Syndrome\*

Philipp Wohlfarth, MD<sup>1</sup>; Gernot Beutel, MD<sup>2</sup>; Pia Lebiedz, MD<sup>3</sup>; Hans-Joachim Stemmler, PhD<sup>4</sup>; Thomas Staudinger, MD<sup>1</sup>; Matthieu Schmidt, PhD<sup>5</sup>; Matthias Kochanek, MD<sup>6</sup>; Tobias Liebrechts, MD<sup>7</sup>; Fabio Silvio Taccone, PhD<sup>8</sup>; Elie Azoulay, PhD<sup>9</sup>; Alexandre Demoule, PhD<sup>10,11</sup>; Stefan Kluge, MD<sup>12</sup>; Morten Svalebjørg, MD<sup>13</sup>; Catherina Lueck, MD<sup>2</sup>; Johanna Tischer, MD<sup>4</sup>; Alain Combes, PhD<sup>5</sup>; Boris Böll, MD<sup>6</sup>; Werner Rabitsch, MD<sup>1</sup>; Peter Schellongowski, MD<sup>1</sup> on behalf of Intensive Care in Hematologic and Oncologic Patients (iCHOP) and the Caring for Critically Ill Immunocompromised Patients Multinational Network (NINE-I)



*Crit Care Med 2017*

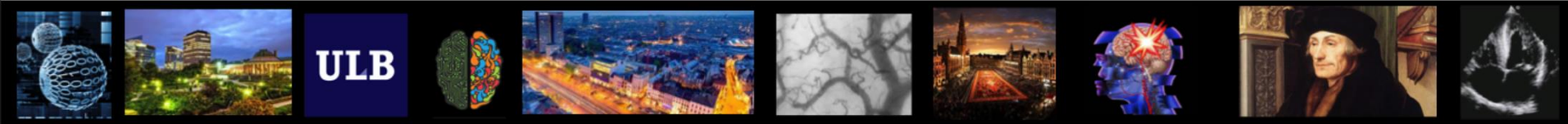




## Characteristics and Outcome of Patients After Allogeneic Hematopoietic Stem Cell Transplantation Treated With Extracorporeal Membrane Oxygenation for Acute Respiratory Distress Syndrome\*

Variable	All Patients (n = 37)	Nonsurvivors (n = 30)	Survivors (n = 7)	p
Underlying condition				0.000947
Acute leukemia	22 (59)	21 (70)	1 (14)	
Lymphoma	5 (14)	5 (17)	0	
Myelodysplastic syndrome	3 (8)	0	3 (43)	
Other malignant condition	4 (11)	2 (7)	2 (29)	
Nonmalignant disease	3 (8)	2 (7)	1 (14)	
Remission status at ICU admission <sup>b</sup>				1.0
Complete remission	27 (79)	22 (79)	5 (83)	
No remission, after engraftment	2 (6)	2 (7)	0	
No remission, prior engraftment	5 (15)	4 (14)	1 (17)	

**Pneumonia 80%; 85% more than 1 OD; 50% Neutropenia**





## Characteristics and Outcome of Patients After Allogeneic Hematopoietic Stem Cell Transplantation Treated With Extracorporeal Membrane Oxygenation for Acute Respiratory Distress Syndrome\*

**37 patients - ARDS and VV-ECMO**

**Initial NIV: 9/37**

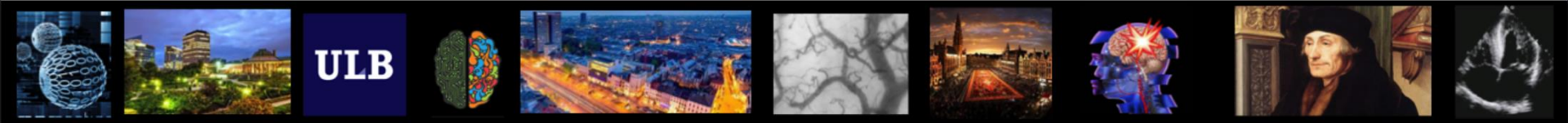
**Hospital and 1-yr Survival - 7/37 (19%)**

Admission during Peritransplant Period  
( $<240$  days after PBSCT)  
Hospital Survival: 1/24 (4%)

Admission after Peritransplant Period  
( $>240$  days after PBSCT)  
Hospital Survival: 6/13 (46%)

**No patient admitted during the first 100 days after PBSCT survived.**

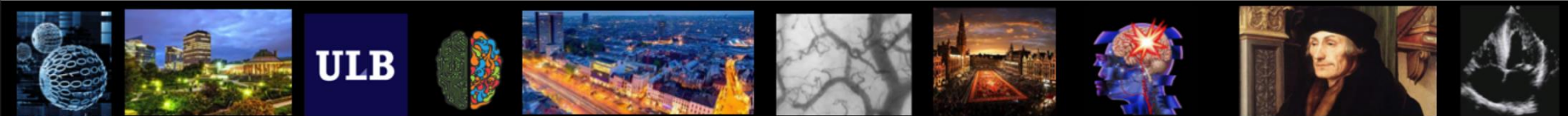
*Crit Care Med 2017.*





## Extracorporeal Life Support for acute Respiratory Failure in Immunocompromised Patients - An international multicenter retrospective study (The IDEA study)

Matthieu Schmidt, Peter Schellongowski, Amandine Dorget, Nicolò Patroniti, Fabio Silvio Taccone, Dinis Reis Miranda, Jean Reuter, H el ene Prodanovic, Romain Sonnevill, Marc Pierrot, Martin Balik, Sunghoon Park, Alain Combes.

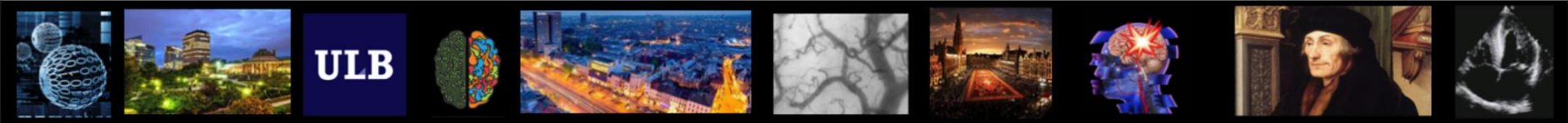






## The IDEA study

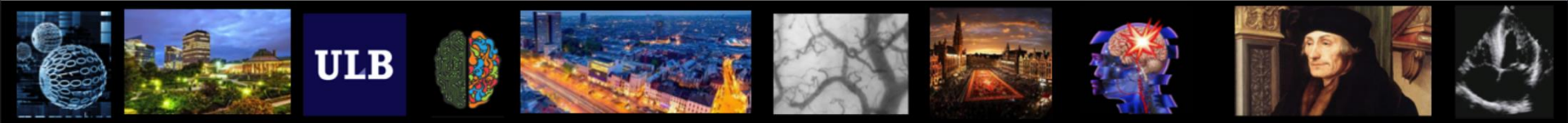
- International, **multicenter** (n=10), retrospective cohort study (2008-2015)
- **Immunocompromised** status was defined as either:
  1. *hematological malignancies*
  2. *active solid tumor*
  3. *solid organ transplant*
  4. *HIV*
  5. *long-term or high dose CS or immunosuppressive agents*
- Acute Respiratory Failure
- VV-ECMO (88%) or ECCO<sub>2</sub>R (7%)





## The IDEA study

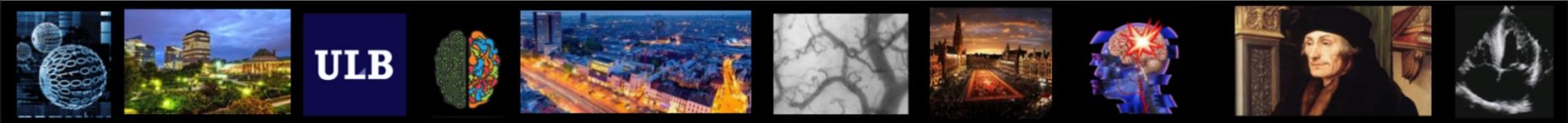
Characteristics	All patients (n=203)
Gender male	127 (62)
Age, years	51 (38-59)
APACHE II	28 (20-33)
SOFA ICU admission	12 (8-15)
Body mass index, kg/m <sup>2</sup>	24.7 (21.7-28.2)
Charlson comorbidity score	3 (2-4)
Newly diagnosed IC status*	51 (25)





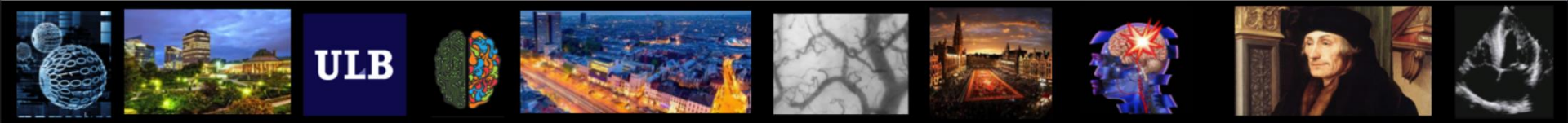
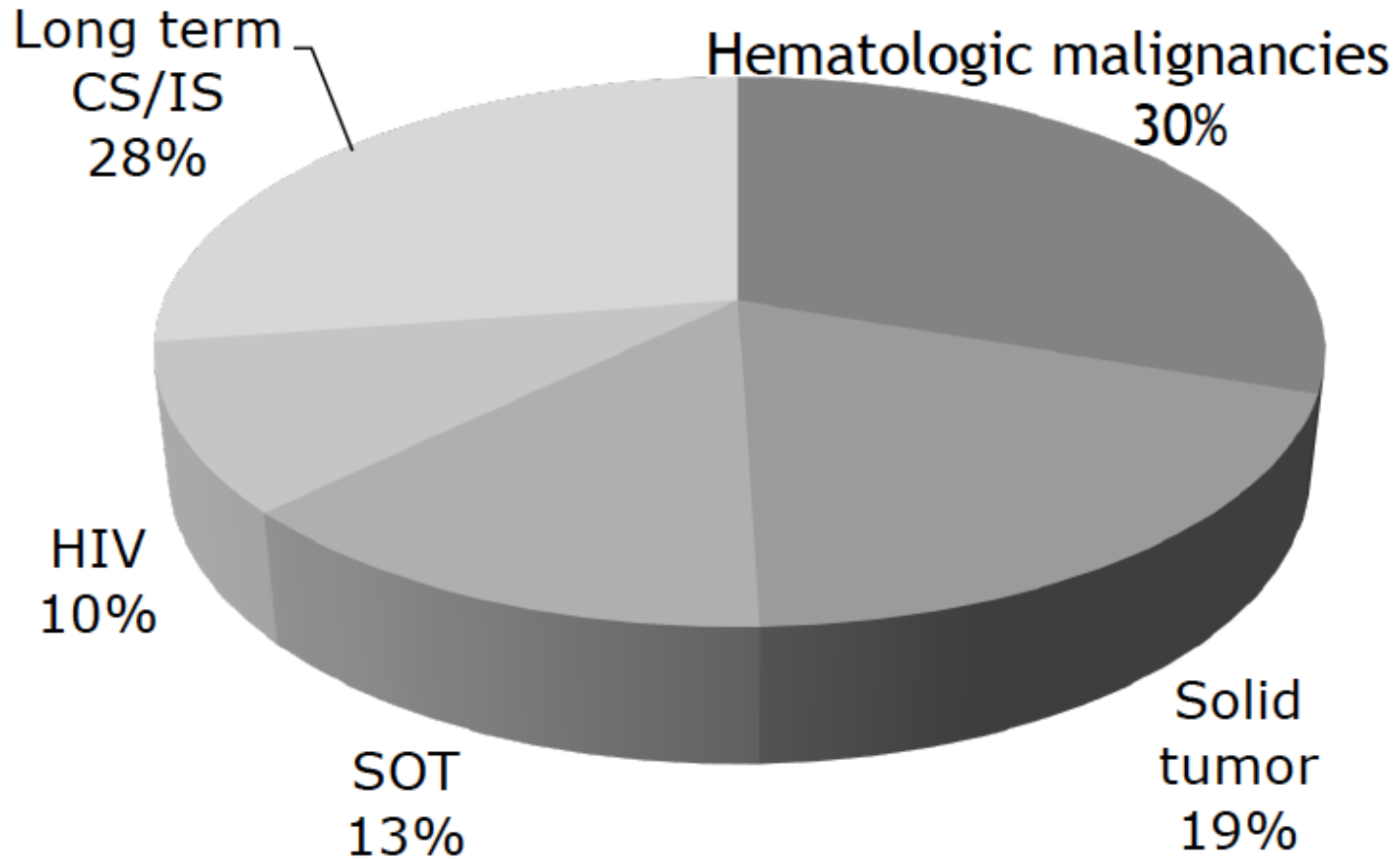
## The IDEA study

Bacterial pneumonia	63 (31)
Viral pneumonia <sup>£</sup>	38 (19)
Specific lung involvement	26 (12)
<i>Pneumocystis jirovecii</i> pneumonia	9 (4)
Post lung transplantation	6 (3)
Aspiration pneumonia	9 (4)
No definite diagnosis	21 (10)
Miscellaneous	41 (20)





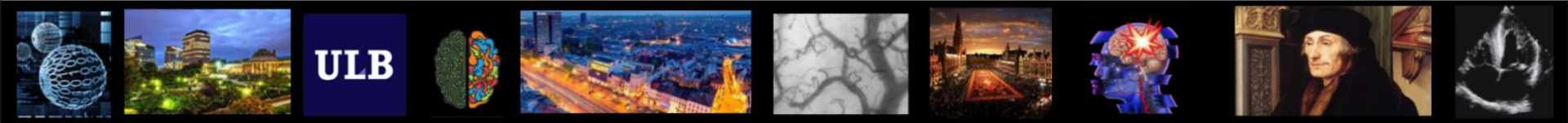
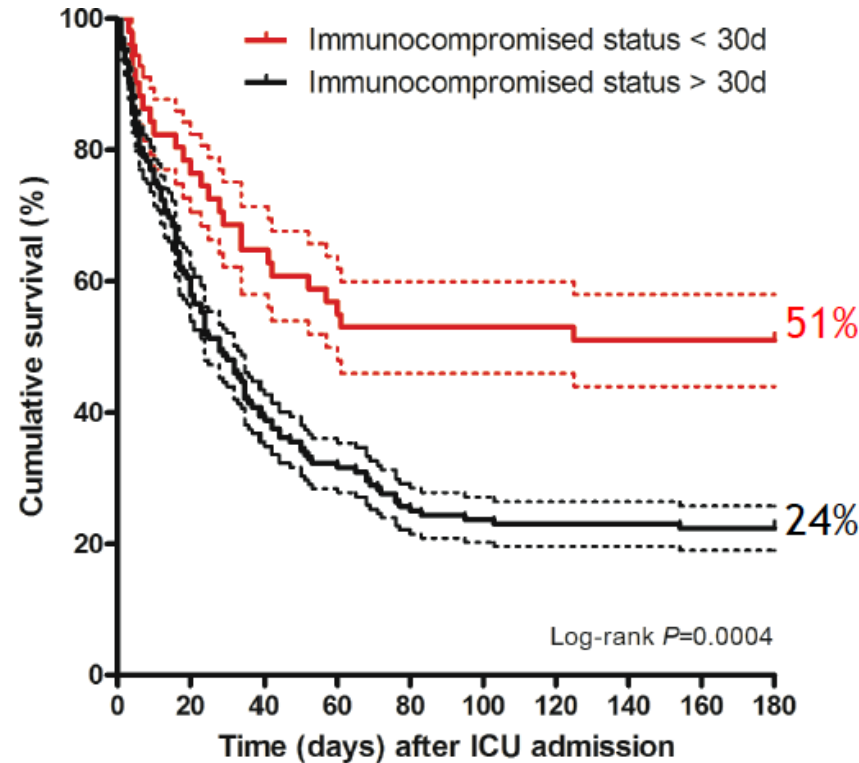
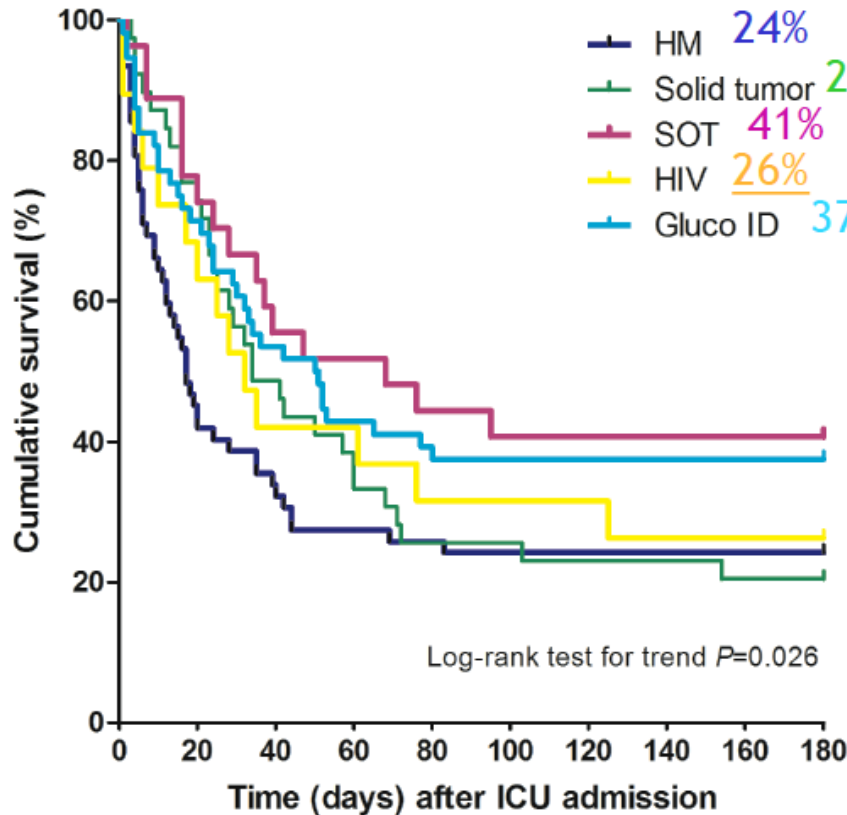
## The IDEA study





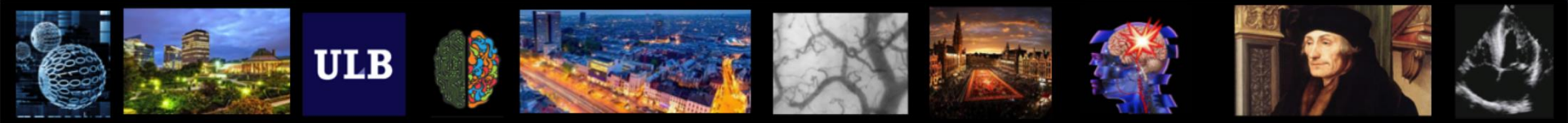


## The IDEA study





- The use of **VV- or VA-ECMO** in critically ill cancer adult patients is feasible - benefits on outcome ?
- ECMO has more complications than other therapies = **SELECTION**
- ECMO may be a **bridging tool** in carefully selected patients
- ECMO **discouraged** during the peri-transplant period after allogeneic PBSCT
- The role of **ECMO centers** on the benefits shown in different studies need to be determined





Medical Hypotheses 81 (2013) 1039–1040

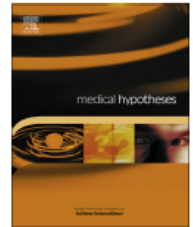


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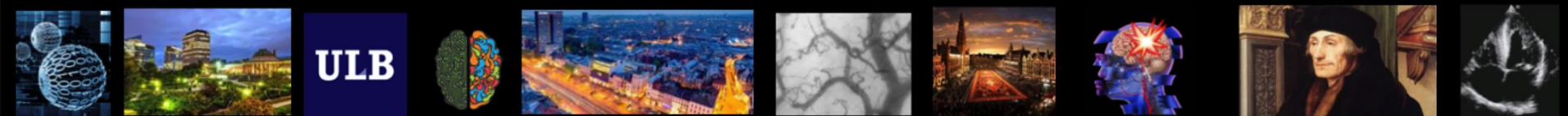
journal homepage: [www.elsevier.com/locate/mehy](http://www.elsevier.com/locate/mehy)



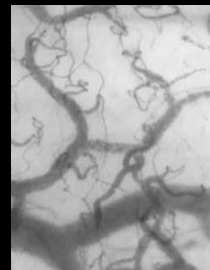
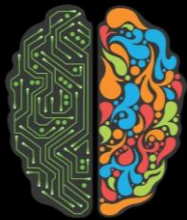
Extracorporeal membrane oxygenation and lethal diseases:  
A new perspective



Massimiliano Greco <sup>a</sup>, Alberto Zangrillo <sup>a</sup>, Laura Pasin <sup>a</sup>, Giovanni Landoni <sup>a,b,\*</sup>







# THANKS



[www.euroneuro2018.org](http://www.euroneuro2018.org)



Update on Neuro-Anesthesia  
& Neuro-Intensive Care  
Interdisciplinary Neuroscience  
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