

Application for Hosting EACTA Vascular Anaesthesia Exchange Training Programme

Institution's Name	Hosital Clínic de Barcelona		
Address	Carrer Villarroel 170		
Department	Anesthesiology, Critical Care	Website	www.hospitalclinic.org
City	Barcelona	ZIP code/Postal code	08036
Country	Spain	Phone	+34932275558
Fax	Click here to enter text.	Email	rmatute@clinic.cat

Programme Supervisor

Name / Surname	Purificación Matute Jiménez (PMJ)
Board Certification(s)	Members of EACTA Thoracic Sub-committee, education for Adult transesophageal echocardiography
Title/Affiliation	Ph, MD; Consultant in Anaesthesiology, group of Cardiovascular and thoracic Anaesthesia

Published Researches in PubMed

1. [Prospective observational cohort study of the association between antiplatelet therapy, bleeding and thrombosis in patients with coronary stents undergoing noncardiac surgery](#). Howell SJ, Hoeks SE, West RM, Wheatcroft SB, Hoeft A; OBTAIN Investigators of European Society of Anaesthesiology (ESA) Clinical Trial Network. Br J Anaesth. 2019 Feb;122(2):170-179. doi: 10.1016/j.bja.2018.09.029. Epub 2018 Dec 15. PMID: 30686302. (as part of it PMatute)
2. [Preoperative predictive model for acute kidney injury after elective cardiac surgery: a prospective multicenter cohort study](#). Callejas R, Panadero A, Vives M, Duque P, Echarri G, Monedero P; Renal Dysfunction in Cardiac Surgery Spanish Group (GEDRCC2). Minerva Anestesiol. 2019 Jan;85(1):34-44. doi: 10.23736/S0375-9393.18.12257-7. Epub 2018 May 11. PMID: 29756690. (as part of it PMatute)
3. [Perioperative hemoglobin area under the curve is an independent predictor of renal failure after cardiac surgery. Results from a Spanish multicenter retrospective cohort study](#). P Duque-Sosa, D Martínez-Urbistondo, G Echarri, RI Callejas, M J Iribarren, G Rábago3, P Monedero, P Matute en Spanish group of renal dysfunction in cardiac surgery (GEDRCC-2). PLOS ONE | DOI:10.1371/journal.pone.0172021 February 22, 2017. Factor de impacto 2.806. (as part of it PMatute)
4. [Clinical Practice Guideline \(CPG\). Recommendations on strategy for reducing risk of heart failure patients requiring noncardiac surgery: reducing risk of heart failure patients in noncardiac surgery](#). Alvarez Escudero J, Calvo Vecino JM, Veiras S, García R, González A; Working Group of the CPG. Rev Esp Anestesiol Reanim. 2015 Aug-Sep;62(7):359-419. doi: 10.1016/j.redar.2015.05.002. Epub 2015 Jul 8. No abstract available. PMID: 26164471. (as part of it PMatute)
5. [Nonelective surgery at night and in-hospital mortality: Prospective observational data from the European Surgical Outcomes Study](#). van Zaane B, van Klei WA, Buhre WF, Bauer P, Boerma EC, Hoeft A, Metnitz P, Moreno RP, Pearse R, Pelosi P, Sander M, Vallet B, Pettilä V, Vincent JL, Rhodes A; European Surgical Outcomes Study (EuSOS) group for the Trials groups of the European Society of Intensive Care Medicine and the European Society of Anaesthesiology. Eur J Anaesthesiol. 2015 Jul;32(7):477-85. doi: 10.1097/EJA.000000000000256. PMID: 26001104. (as part of it PMatute)
6. [The importance of intraoperative transesophageal echocardiography in the surgical decision in cardiac surgery](#). Emperador F, Fita G, Arguís MJ, Gómez I, Tresandi D, Matute P, Roux C, Gomar C, Rovira I. Rev Esp Anestesiol Reanim. 2015 Jan;62(1):10-7. doi: 10.1016/j.redar.2014.03.007. Epub 2014 Jul 18. English, Spanish. PMID: 25041852
7. [Spinal cord protection and related complications in endovascular management of B dissection: LSA revascularization and CSF drainage](#). Riambau V, Capoccia L, Mestres G, Matute P. Ann Cardiothorac Surg. 2014 May;3(3):336-8. doi: 10.3978/j.issn.2225-319X.2014.04.03. No abstract available. PMID: 24967177
8. [Medical and surgical management for chronic thromboembolic pulmonary hypertension: a single center experience](#). Coronel ML, Chamorro N, Blanco I, Amado V, Del Pozo R, Pomar JL, Badía JR, Rovira I, Matute P, Argemí G, Castellà M, Barberà JA. Arch Bronconeumol. 2014 Dec;50(12):521-7. doi: 10.1016/j.arbres.2014.04.011. Epub 2014 Jun 21. English, Spanish. PMID: 24957814
9. [Perioperative management of atrial fibrillation](#). Arguís MJ, Navarro R, Regueiro A, Arbelo E, Sierra P, Sabaté S, Galán J, Ruiz A, Matute P, Roux C, Gomar C, Rovira I, Mont L, Fita G. Rev Esp Anestesiol Reanim. 2014 May;61(5):262-71. doi: 10.1016/j.redar.2013.01.004. Epub 2013 Mar 21. Review. Spanish. PMID: 23522980
10. [Transfusión intraoperatoria en cirugía cardíaca. Estudio retrospectivo anidado de casos y controles](#). J.R. Pérez-Valdivieso*, P. Monedero, N. García-Fernández, M. Vives ,F.J. Lavilla y M. Bes-Rastrollo, en representación del Grupo Español de Disfunción Renal en Cirugía Cardíaca. P Matute (GEDRCC). Rev Esp Anestesiol Reanim. 2013; 60(2):79-86
11. [Mortality after surgery in Europe: a 7 day cohort study](#). Pearse RM, Moreno RP, Bauer P, Pelosi P, Metnitz P, Spies C, Vallet B, Vincent JL, Hoeft A, Rhodes A; European Surgical Outcomes Study (EuSOS) group for the Trials groups of the European Society of Intensive Care Medicine and the European Society of Anaesthesiology. Lancet. 2012 Sep 22;380(9847):1059-65. doi: 10.1016/S0140-6736(12)61148-9. PMID: 22998715. (as part of it PMatute)
12. [Timing of renal replacement Therapy after cardiac surgery: a retrospective multicenter Spanish cohort study](#). García-Fernández N, Pérez-ValdiviesoJR, Bes-Rastrollo M, Vives M, Lavilla J, Herreros J, Monedero P, GEDRCC Group (Matute P). Blood Purif 2011; 32:104-111. IF 1,890
13. [Lung sparing surgery by means of extended broncho-angioplastic \(sleeve\) lobectomies](#). Gómez-Caro A, García S, Jiménez MJ, Matute P, Gimferrer JM, Molins L. Arch Bronconeumol. 2011 Feb;47(2):66-72. doi: 10.1016/j.arbres.2010.09.010. Epub 2011 Jan 22. English, Spanish. PMID: 21256657
14. [Three serious complications related to pulmonary artery catheters in cardiovascular and thoracic surgery](#). Tena B, Matute P, Rovira I, Roux C. Rev Esp Anestesiol Reanim. 2010 Jan;57(1):66. Spanish. No abstract available. PMID: 20196524
15. [Cardiac surgery associated acute agude kidney injury requiring renal replacement therapy. A Spanish retrospective case-cohort study](#). Pérez-ValdiviesoJR, Monedero P, Vives M, García-Fernández N, Bes-Rastrollo M, GEDRCC Group (Matute P). BMC Nephrol 2009; 10: 27. IF 2,14
16. [Extrapleural lung membrane provides better lung protection than conventional treatment for severe postneumonectomy non cardiogenic acute respiratory distress syndrome](#). Iglesias M, Jungbluth P, Petit C, Matute MP, Rovira I, Martínez E, catalán M, Ramírez J, Macchiarini P. J Thoracic Cardiovasc Surg 2008; 135 (6): 1362-71. IF 3,063
17. [Serious mechanical complications associated with pulmonary artery catheters in cardiovascular and thoracic surgery](#). Tena B, Gomar C, Roux C, Fontanals J, Jiménez MJ, Rovira I, Fita G, Matute P. Rev Esp Anestesiol Reanim. 2008 Oct;55(8):487-92. Spanish. PMID: 18982786
18. [Experimental Safety And Efficacy Evaluation Of An Extrapleural Pumps Artificial Lung In Providing Respiratory Support Via The Axillary Vessels](#) Iglesias M, Jungbluth P, Sibila O, Aldabó I, Petit C, Martínez E, Matute MP, Macchiarini P. J Thoracic Cardiovasc Surg 2007; 133 (2): 339-45 IF 3,063
19. [Stent grafting-related acute type B redissection](#). Riambau V, Guerrero F, Murillo I, Rivadeneira M, Montaña X, Matute P. Vascular. 2008 Mar-Apr;16(2):101-5. PMID: 18377840

20. [Safety concerns about perisurgical epoetin treatment: should we add antiplatelet drugs to perisurgical epoetin alfa treatment?](#) Basora M, Fita G, **Matute P**, Díaz-Ricart M. J Cardiothorac Vasc Anesth. 2007 Aug;21(4):623-4. Epub 2006 Oct 6. No abstract available. PMID: 17678803
21. [Transoesophageal echocardiography accurately detects cardiac output variation: a prospective comparison with thermodilution in cardiac surgery.](#) Parra V, Fita G, Rovira I, **Matute P**, Gomar C, Paré C. Eur J Anaesthesiol. 2008 Feb;25(2):135-43. Epub 2007 Aug 2. PMID: 17672920
22. [Kidney-specific proteins in patients receiving aprotinin at high- and low-dose regimens during coronary artery bypass graft with cardiopulmonary bypass.](#) Faulí A, Gomar C, Campistol JM, Alvarez L, Manig AM, **Matute P**. Eur J Anaesthesiol. 2005 Sep;22(9):666-71. PMID: 16163912
23. [\[Remodelamiento de la pared aórtica en la disección tipo B crónica tras reparación con stents recubierto\].](#) García-Madrid C, Rimbau V, Murillo I, Castellá M, Muntaña X, **Matute P**, García-Tomel M. Angiología 2005; 57(6): 457- 464
24. [Intraaneural injection during anterior approach for sciatic nerve block.](#) Sala-Blanch X, Pomés J, **Matute P**, Valls-Solé J, Carrera A, Tomás X, García-Diez AI. Anesthesiology. 2004 Oct;101(4):1027-30. No abstract available. PMID: 15448541
25. [Pattern of renal dysfunction associated with myocardial revascularization surgery and cardiopulmonary bypass.](#) Faulí A, Gomar C, Campistol JM, Alvarez L, Manig AM, **Matute P**. Eur J Anaesthesiol. 2003 Jun;20(6):443-50. PMID: 12803260
26. [\[No cuello, ningún problema: endoprótesis fenestrada\].](#) Rimbau V, Montaña X, Caserta G, Real MI, **Matute P**, Ayuso JR, Caralt T. Tech Endovasc 2003; VI (4): 916-918.
27. [\[Reparación endovascular de las disecciones de aorta tipo B\].](#) Rimbau V, Montaña FJ, García C, Real MI, **Matute MP**, Ayuso J, Azqueta M, Mulet J. Tech Endovasc. 2002; 5: 474-479.
28. [\[Aortic stent: the anesthesiologist's point of view\].](#) **Matute P**. Rev Esp Anestesiología Reanim. 2001 Dec;48(10):496-8. Review. Spanish. PMID: 11792310
29. [\[Utilidad de las endoprótesis aorto-unifacetas. Un caso práctico\].](#) Rimbau V, Montaña X, Bahamonde JA, García I, Castro MA, Real M, **Matute P**, Mulet J. Tech Endovasc. 2000;3:127-128.
30. [\[Reparación secuenciada de aneurisma de aorta torácica descendente\].](#) Rimbau V, Montaña X, Bahamonde JA, García I, Castro MA, **Matute P**, Real M, Josa M, Mulet J. Tech Endovasc. 2000; 3:129-130.
31. [\[Learning cardiopulmonary resuscitation using conventional external cardiac massage or active compression-decompression in simulated cardiopulmonary resuscitation\].](#) Ormaque I, Gomar C, Fernández C, Fábregas N, Basora M, **Matute P**. Rev Esp Anestesiología Reanim. 1999 May;46(5):186-90. Spanish. PMID: 10379184
32. [\[Implantable automatic cardioverter-defibrillator: anesthesia experience / Desfibrilador automático implantable: experiencia anestésica\].](#) Izquierdo E, **Matute P**, Gomar C, Nalda MA. Rev Esp Anestesiología Reanim. 1995 Dec;42(10):424-7. Spanish. PMID: 8789527

EACTA/ESA/other societies membership

PMJ is EACTA Vascular Subcommittee member
ESA/SEDAR Sociedad Española de Anestesia y Reanimación) y
SCARTD (Sociedad Catalana d'Anestesiologia, Reanimació i Terapèutica

Email

pmatute@clinic.cat

Mailing Address

Servicio de Anestesia y Reanimación. Hospital Clínic

Street

Villarroel 170

City

Barcelona

Region

Cataluña

Country

Spain

City/Zip code

08036

Phone

+34670805062/ +34932275558

Fax

+34932279184

Will the Programme director devote sufficient time to provide substantial leadership to the programme and supervision for the fellows? Yes No

Language requirements:

English or Spanish. (Fluency).

Specific legal or other requirements of an attending trainee:

Anesthesiology specialist

Preferred Duration 1 week 2 weeks 3 weeks 4 weeks others 2-4 weeks periods

Preferred Months January February March April May June

July August September October November December

Preferred Seniority Level Junior Experienced Very Experienced

Number of Positions Per Year

6

Financial Statement

Accommodation is provided Yes No
Transportation/travel options are provided Yes No
 This opportunity is not funded by the centre Yes No

Source of financial support for the candidate:

- Host centre
- Candidate 's centre
- Scholarship
- Educational grant
- Award
- Candidate's own expenses
- Others

Please, describe Hospital Clinic does not offers financial support sources for the trainers. Others sources are admitted

Aims, goals and objectives of the Exchange Training Programme

To acquire technical skills in preoperative assessment, anaesthesia, monitoring and postoperative care o vascular surgery including both conventional vascular major surgery (aortic, carotid) , complex endovascular surgery (TEVAR, EVAR) and pheripheral vascular surgery. T his four **weeks' Training period** as **Observer** has the aim to improve the practical knowledge

Clinical interests

The Anaesthesiologists of the Cardiothoracic Section of Hospital Clinic are a group of Anaesthesiologists who work exclusively with the Thoracic, Cardiac and Vascular surgical patients.

The group is specially focused in:

- Improvement of the perioperative care Vascular patients,
- Implementation of ERAS,
- Open abdominal aortic procedures (aortic thoracic open surgery is performed by cardiac surgeons).
- Endovascular aortic procedures (EVAR, TEVAR, CHIVAR...), including medular ischemia protective management and techiques.
- Endovascular aortic emergencies (anesthesiologist duty team).
- Paraplegia in vascular surgery (protective techniques: drain of SCF, sensitive/motor evoked potentials)
- Carotid open endarterectomy and stent procedures.
- Anesthesia for peripheral vascular procedures.
- Care and pain management for patients with critical limb ischemia and undergone limb amputation
- Transesophageal echocardiography
- Thoracic and epidural blockade.
- Ultrasound-guided locoregional blockages (upper and lower limb).
- Multimodal analgesia protocol.
- Improvement of the perioperative care of Thoracic and Cardiac patients, including the establishment of prehabilitation programme (for vascular patients we are start to desing the protocol of prehabilitation)

Lab interests

We have and are currently participating in multicentric trials endorsed by the ESA and EACTA (OBTAIN, MET-REPAIR

Publications in PubMed

1. [Spinal cord protection and related complications in endovascular management of B dissection: LSA revascularization and CSF drainage](#). Rimbau V, Capoccia L, Mestres G, **Matute P**. Ann Cardiothorac Surg. 2014 May;3(3):336-8. doi: 10.3978/j.issn.2225-319X.2014.04.03. No abstract available. PMID: 24967177
2. [Medical and surgical management for chronic thromboembolic pulmonary hypertension: a single center experience](#). Coronel ML, Chamorro N, Blanco I, Amado V, Del Pozo R, Pomar JL, Badia JR, Rovira I, **Matute P**, Argemí G, Castellà M, Barberà JA. Arch Bronconeumol. 2014 Dec;50(12):521-7. doi: 10.1016/j.arbres.2014.04.011. Epub 2014 Jun 21. English, Spanish. PMID: 24957814
3. [Stent grafting-related acute type B redissection](#). Rimbau V, Guerrero F, Murillo I, Rivadeneira M, Montaña X, **Matute P**. Vascular. 2008 Mar-Apr;16(2):101-5. PMID: 18377840
4. [Remodelamiento de la pared aórtica en la disección tipo B crónica tras reparación con stents recubierto](#). García-Madrid C, Rimbau V, Murillo I, Castellà M, Muntaña X, **Matute P**, García-Tornel M. Angiología 2005; 57(6): 457- 464
5. [\[No cuello, ningún problema: endoprótesis fenestrada\]](#). Rimbau V, Montaña X, Caserta G, Real MI, **Matute P**, Ayuso JR, Caralt T. Tech Endovasc 2003; VI (4): 916-918.
6. [\[Reparación endovascular de las disecciones de aorta tipo B\]](#). Rimbau V, Montaña FJ, García C, Real MI, **Matute MP**, Ayuso J, Azqueta M, Mulet J. Tech Endovasc. 2002; 5: 474-479.
7. [\[Aortic stent: the anesthesiologist's point of view\]](#). **Matute P**. Rev Esp Anestesiol Reanim. 2001 Dec;48(10):496-8. Review. Spanish. PMID: 11792310
8. [\[Utilidad de las endoprótesis aorto-uniilíacas. Un caso práctico\]](#). Rimbau V, Montaña X, Bahamonde JA, García I, Castro MA, Real M, **Matute P**, Mulet J. Tech Endovasc. 2000;3:127-128.
9. [\[Reparación secuenciada de aneurisma de aorta torácica descendente\]](#). Rimbau V, Montaña X, Bahamonde JA, García I, Castro MA, **Matute P**, Real M, Josa M, Mulet J. Tech Endovasc. 2000; 3:129-130.

Resources

Check if each of the following is available at your centre.

Resource	Yes	Number	Working days per week
Number of working days per week		7	7
Total dedicated ward beds for vascular surgery		10	7
Number of ICU beds dedicated to vascular surgery patients	<input checked="" type="checkbox"/>	2	7
Post-anaesthesia care unit for vascular patients	<input checked="" type="checkbox"/>	3	7
Monitoring and advanced life support equipment	<input checked="" type="checkbox"/>	2	7
Dedicated operating rooms for vascular surgery	<input checked="" type="checkbox"/>	1	4-5 (every 2 weeks 4)
Interventional vascular facility	<input checked="" type="checkbox"/>	1	1
Outpatient Clinic for perioperative evaluation of patients undergoing vascular procedures	x	1	2
24-hours acute pain service available for patients undergoing vascular procedures	<input checked="" type="checkbox"/>	1	7
Meeting Rooms	<input checked="" type="checkbox"/>	3	7
Classrooms with visual and other educational aids	<input checked="" type="checkbox"/>	2	7
Study areas for trainees	<input checked="" type="checkbox"/>	2	7
Office space for faculty members and trainees	<input checked="" type="checkbox"/>	3	7
Diagnostic facilities	x	1	7
Therapeutic facilities	x	1	7
24-hour laboratory services available in the hospital	x	1	7

Clinical Training

Number of performed procedures / week around 8-12 procedures
(If one week there are more procedures of major surgery, ie AAA open surgery, we perform less cases of another shorter surgery during week, the number of cases are depend of weekly schedule surgery, the number of procedures anoted in the table are approximately)

Aortic abdominal open surgery	4 hours/procedure	1-2/week
Carotid surgery	2 hours/procedure	1-2/ week
Endovascular Surgery (EVAR/TEVAR)	3 hours/procedure	2/week
Complex endovascular surgery	6-7 hours procedure	1-2/month
Peripheral vascular surgery (open)	3 hours/procedure	2-3 week
Peripheral endovascular surgery	2 hours procedure	3-4/week
Limb amputations	1 hour/procedure	2-3/week
Arterious venous fistula	1 hour /procedure	3-4/week

Academic Education

Patient Care

Competency Area	Settings/Activities
Following the standards for patient care and established guidelines and procedures for patient safety, error reduction, and improved patient outcomes.	OK (Surgical check list)
Pre-operative patient evaluation and optimization of clinical status prior to the complex and minor vascular procedures.	OK,
Interpretation of cardiovascular and neuromonitoring data.	OK ((LIDCO, NIRS)
Objectives, indications, and targets of cerebrospinal fluid drainage.	OK (liquoguard monitoring)
Pharmacological and mechanical circulatory support.	OK
Peri-operative critical care, including ventilatory support and peri-operative pain management.	OK (e.g. NIV, CPAP, ...)
Providing anaesthesia care for patients undergoing open and endovascular vascular surgery.	OK

Medical Knowledge

Indicate the activity(ies) (lectures, conferences, journal clubs, clinical teaching rounds, etc.) in which trainees will demonstrate knowledge in each of the following areas. Also indicate the method(s) used to assess competence.

Area of Knowledge	Settings/Activities
Embryological development of the thoracic aorta and major vessel structures.	Weekly Clinical Session of Anaesthesiology for specialists and residents. Twice per week residents' teaching
Pathophysiology, pharmacology, and clinical management of patients undergoing vascular procedures.	Weekly Clinical Session of Anaesthesiology for specialists and residents. Twice per week residents' teaching
Pre-anaesthetic evaluation and preparation of adult vascular patients.	Weekly Clinical Session of Anaesthesiology for specialists and residents. Twice per week residents' teaching
Invasive and minimally-invasive haemodynamic and neurological monitoring.	Weekly Clinical Session of Anaesthesiology for specialists and residents. Twice per week residents' teaching
Pharmacokinetics and pharmacodynamics of medications prescribed for clamping and de-clamping of thoracic and abdominal aorta.	Weekly Clinical Session of Anaesthesiology for specialists and residents. Twice per week residents' teaching

Area of Knowledge	Settings/Activities
Pain management of adult vascular surgical patients.	Weekly Clinical Session of Anaesthesiology for specialists and residents. Twice per week residents' teaching
Pain management for phantom limb pain.	Weekly Clinical Session of Anaesthesiology for specialists and residents. Twice per week residents' teaching
Quality assurance/ improvement.	Weekly Clinical Session of Anaesthesiology for specialists and residents. Twice per week residents' teaching
Ethical and legal issues, and practice management.	Weekly Clinical Session of Anaesthesiology for specialists and residents. Twice per week residents' teaching

Evaluation of Trainees

- The Programme Supervisor will give an appraisal for each fellow following the observership. Yes No
- The centre will be able to maintain a register of those fellows who have entered and successfully completed a training programme. Yes No

Other Comments:

- I. Attendance to the Aorta Committee: once weekly. Patients with aortic disease are reviewed and discussed. The Aorta Committee is a multidisciplinary Committee (cardiac surgeons, vascular surgeons, anaesthesiologists, interventional radiologists and cardiologists). Patients are scheduled for surgery (yes/not), open/endovascular, cardiac or vascular surgery. The trainees would attend to the aorta committee and afterwards to the OR. Surgical vascular activity starts after Aorta Committee (8:00 -8:45)
- II. Chapter of books (in relationship whit this application) (in Spanish)
 - Gomar C, **Matute P**. Anestesia para cirugía vascular. En F.E.E.A eds. Ediciones Ergón, S.A. 2005:577-622. ISBN: 84-8473-336-X
 - Riambau V, **Matute P**. "Automatic monitoring of spinal fluid drainage: safer protection for spinal cord ischemia". En Vascular and Endovascular consensus Update. R Greenhald ed. BIBA publishing, 2011 London. ISBN: 0-9544687-8-3. Pp: 61-66.
 - Matute P**, Ayats C. "Valoración preoperatoria y establecimiento del riesgo clínico".En C. Gomar, MT Mata , JL Pomar eds, Fisiopatología y Técnicas de Circulación Extracorpórea. segunda edición. Madrid-Barcelona ERGÓN 2011: 161- 74. ISBN: 978-84-8473-955-5.
 - Matute P**, Ayats C, Hervias A. "Monitorización en cirugía cardiaca". En C. Gomar, MT Mata, JL Pomar eds .Fisiopatología y Técnicas de Circulación Extracorpórea , segunda edición. Madrid-Barcelona ERGÓN 2011: 175- 90. ISBN: 978-84-8473-955-5.
 - Fita G, **Matute P**, Rovira R, Bergé R, Mulet J. "Alteraciones neurológicas y sus complicaciones" .En C. Gomar, MT Mata, JL Pomar eds. Fisiopatología y Técnicas de Circulación Extracorpórea, segunda edición. Madrid-Barcelona ERGÓN 2011: 355- 69. ISBN: 978-84-8473-955-5.
 - Gomar C, **Matute P**, Ferrero M, Puente A. "Farmacología cardiovascular: agentes inotrópicos, alfa-adrenérgicos, beta-adrenérgicos y vasodilatadores. En C. Gomar, MT Mata, JL Pomar eds. Fisiopatología y Técnicas de Circulación Extracorpórea, segunda edición. Madrid-Barcelona ERGÓN 2011: 141- 60. ISBN: 978-84-8473-955-5.

To be completed by the Head of department or the authorised deputy.

Please fill in all required fields and send to eacta@aimgroup.eu

Submit