



## Discipline Information

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The following dates are in (dd/mm/yyyy) format.

Code: RAL5856 - 3 Type: POS  
Name: Methods of Investigation in Acute Normovolemic Hemodilution.  
Concentration area: Ciências da Saúde Aplicadas ao Aparelho Locomotor (17142)

### Approval dates:

CCP: 17/02/2017 CPG: 30/05/2017 CoPGr: 16/08/2017

Activation date: 16/08/2017 Inactivation date:

### Workload:

Total: 60 h Theory: 8 h Practice: 4 h Study: 3 h

Credits: 4 Duration: 4 weeks

Professors: 57845 - Luis Vicente Garcia - 16/08/2017 until today

### Objectives:

- 1) To present to the students the technique of intraoperative hemodilution, with contemplation of the practical, clinical and economic aspects, with emphasis to the topics related to the clinical investigation in this area.
- 2) Encourage the creation of lines of research on related themes

Enable postgraduate students to:

- 1) Develop projects in this line of research
- 2) Discuss, critically, the main work relevant to the topic.

### Rationale:

Blood transfusion is life-saving therapy. However, it is related to numerous complications, including the transmission of diseases. It is therefore necessary to indicate this only in cases where it is absolutely necessary. There are several strategies that avoid homologous blood transfusion and hemodilution is one of them. It is a technique that promotes the loss of lesser amount of erythrocytes during surgical procedures, with consequent blood salvage. Although simple, it is a little used technique. There is still much doubt as to its efficacy and possible repercussions on the circulatory system and on hemostasis, especially in the anesthetized patient. This topic is a line of research that I have developed for some time and is an excellent model for the acquisition of knowledge in clinical research.

### Content:

Theoretical classes

1. Functions of blood and physiological bases for indication of blood transfusion.
2. Surgical haemotherapy: current view
3. The anemic patient under anesthesia and surgery



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4. Intraoperative haemodilution: quantitative analysis
5. Intraoperative haemodilution: qualitative analysis
6. Methods of investigation in intraoperative hemodilution

### Bibliography:

Araújo Azi LMT, Lopes FM, Garcia LV. Postoperative management of severe acute anemia in a Jehovah's Witness. *Transfusion*, 2014;54:1153-1157.

Bang SR, Kim YH, Kim GS. The effects of in vitro hemodilution with 6% hydroxyethyl starch (HES) (130/0.4) solution on thrombelastograph analysis in patients undergoing liver transplantation. *Clin Transplant*, 2011;25:450-456

De Souza MA, Klamt JG, Garcia LV. Effects of acute normovolemic hemodilution on blood coagulation: comparison between tests of an in vivo and an in vitro model. *Rev Bras Anesthesiol*, 2010;60:363-375.

Habib AS, Moul JW, Polascik TJ, et al. Perioperative Outcome Study Group. Low central venous pressure versus acute normovolemic hemodilution versus conventional fluid management for reducing blood loss in radical retropubic prostatectomy: a randomized controlled trial. *Curr Med Res Opin*. 2014; 30(5):937-43.

Hare GM. Tolerance of anemia: understanding the adaptive physiological mechanisms which promote survival. *Transfus Apher Sci*. 2014; 50(1):10-12.

Kamath S, Ramesh VJ, Rao UG. Contralateral intracranial hematoma after uneventful aneurysm clipping: role of blood pressure regulation during management of vasospasm. *J Neurosurg Anesthesiol*, 2011;23:168-169.

Liewellyn RL, James MF. The effect of low molecular weight heparin (enoxaparin) on enhanced coagulation induced by crystalloid haemodilution. *Anaesthesia*, 2010;65(10):1013-1016.

Nobahar MR, Chegini A, Behnaz F. Preoperative blood donation versus acute normovolemic hemodilution in cardiac surgery. *Saudi J Anaesth*. 2014;8(3):342-344.

Putchakayala K, DiFronzo LA. Acute hemodilution is safe in patients with comorbid illness undergoing partial hepatectomy. *Am Surg*. 2013;79(10):1093-1097.

Ruttman TG, Montoya-Pelaez LF, James MF. The coagulation changes induced by rapid in vivo crystalloid infusion are attenuated when magnesium is kept at the upper limit of normal. *Anesth Analg*, 2007; 104(6):1475-1480.

Scott DA, Tung HM, Slater R. Perioperative Hemoglobin Trajectory in Adult Cardiac Surgical Patients. *J Extra Corpor Technol*. 2015;47(3):167-173.

Sebastian R, Ratliff T, Winch PD, et al. Revisiting acute normovolemic hemodilution and blood transfusion during pediatric cardiac surgery: a prospective observational study. *Paediatr Anaesth*. 2017; 27(1):85-90.

Shin HJ, Na HS, Do SH. The effects of acute normovolaemic haemodilution on peri-operative coagulation in total hip arthroplasty. *Anaesthesia*. 2015; 70(3):304-309.

Verma S, Eisses M, Richards M. Blood conservation strategies in pediatric anesthesia. *Anesthesiol Clin*, 2009; 27(2):337-51.

Wang P, Yan CY, Cai XJ. Acute hypervolemic hemodilution effect on oxygen metabolism and blood pharmacokinetics in patients undergoing acute laparotomy during induction of general anesthesia. *Hepatogastroenterology*. 2014;61(136):2196-2199.

### Type of Assessment:

Seminars



## Discipline Information

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1. Intraoperative haemodilution: practical aspects
2. Complications related to intraoperative hemodilution
3. Comparison of normovolemic hem

Note:

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