Meet the Experts Path

Managing anticoagulation in CRRT

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G. Villa


129
91
74/55 (62)
(254)

Diagnosis of hospital admission (April 10th 2019):	**Unspecified obstruction of the kidney pelvis and ureter**
Physiological history	61 yrs No allergies No smoke
Medical history	- Hypertension - Hyperuricemia - Diabetes mellitus tipe II - TIA about 6 years ago - Hystory of arrhythmias --> PM - Cholecystectomy - August 2015: TURP
Current medical history	- In **2017**, **fever** and left lumbar pain. At ED left **hydroureteronephrosis** and ureteral pigtail placement - Periodic pigtail displacement with **new episodes of fever** and low back pain requiring **left pigtail** repositioning.

- Creatinine (04/2018) **1.28 mg/dl (Weight = 80 Kg)**

- **24/11/18 access in ED for fever with chills**.

- **26/11/18 Creatinine 1.62 mg/dl**

- combined pyelography in narcosis: stenosis of the pieloureteral joint. Semi-rigid ureterorenoscopy up to the level of the ureteropielic joint which appears rigid but can be overcome by the instrument.

On 09/04/2019 he underwent scheduled robotic surgery for left pyeloplasty.

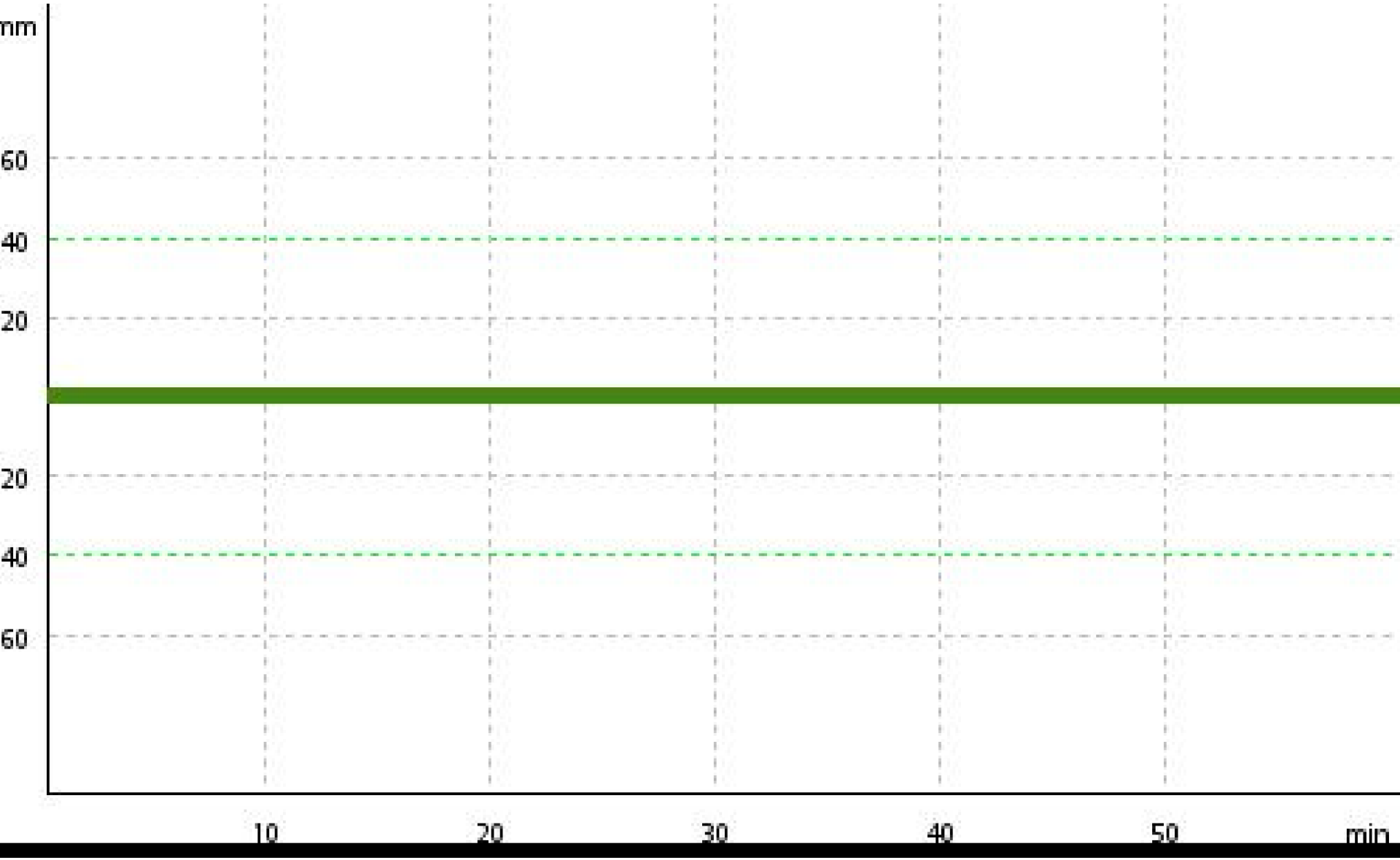
Postoperative shock in Recovery Room

VOLEMIC RESUSCITATION
(BALANCED CRYSTALOIDS SOLUTIONS) + NE + Emergency surgery

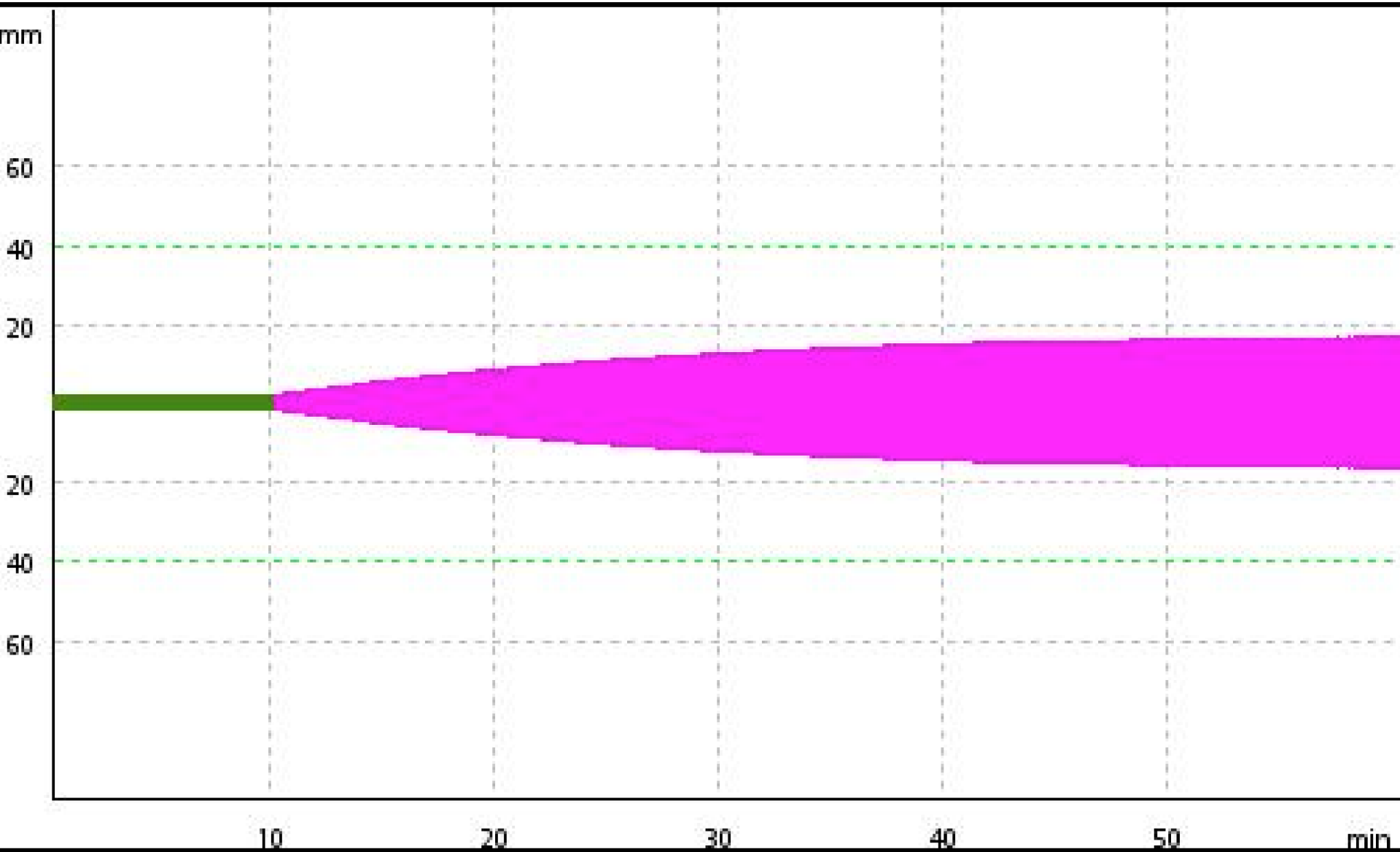
Intensive Care Unit - 10 April at 00.34 a.m.

00:34 a.m.	The patient returns from the OR sedated and intubated, **norepinephrine at 0.9 mcg/Kg/min**. Received volume load and placed in Trendelemburg, Blood pressure: 80/40 mmHg. Sent emergency blood count and coagulation in emergency. Infusion **1 gr of fibrinogen.**
03:31 a.m.	After blood tests, 1 g of **fibrinogen** (**total 2 g**) and **500 IU of confidex**. Continuous filling with **crystalloids**, two plasma units required. Reduced **norepinephrine infusion at 0.8 mcg/Kg/min**. Normothermic. **Lactate 4.4 mmol/l**

FIBTEM 1



EXTEM 1



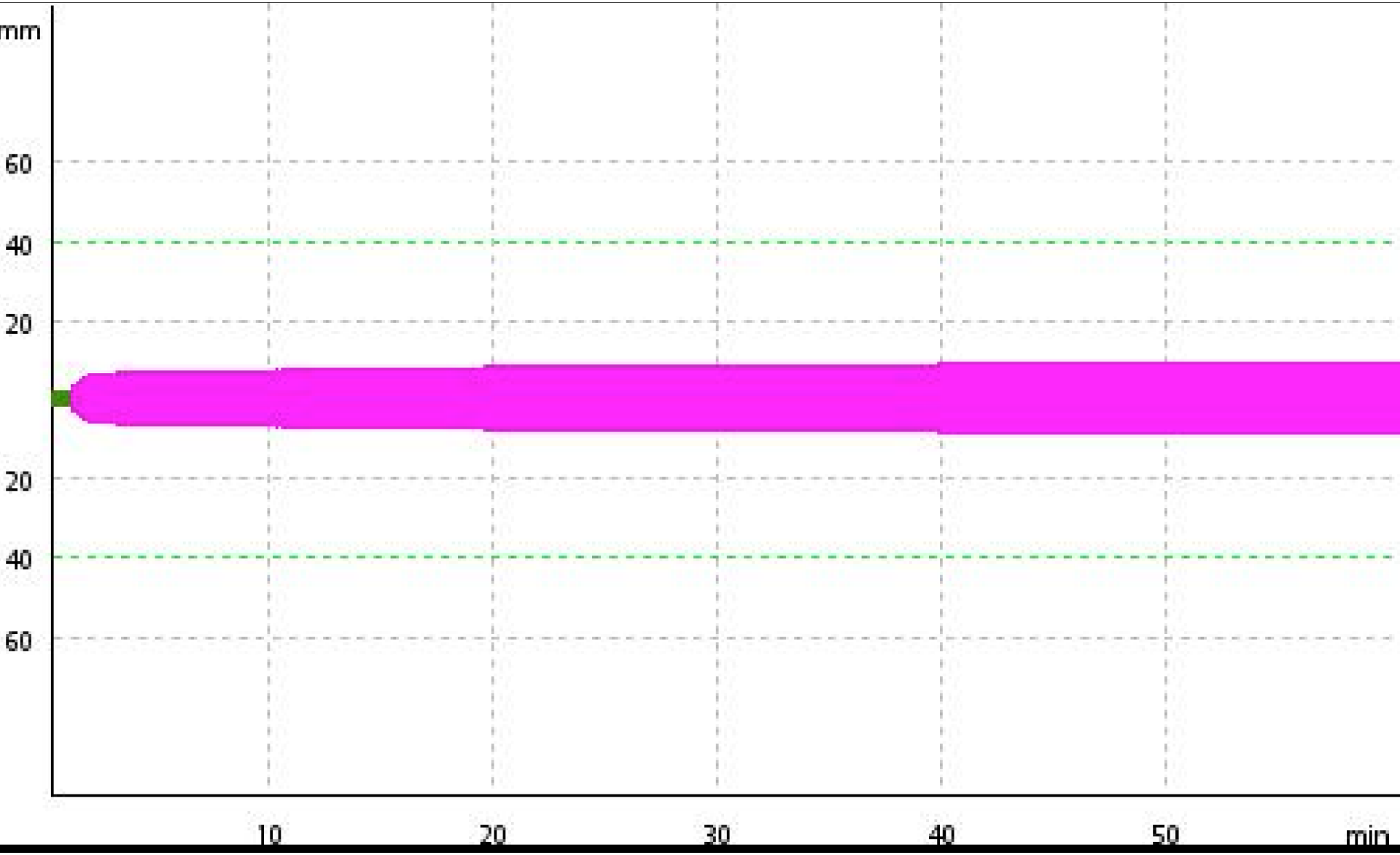
FIBTEM 2

Intensive Care Unit - 10 April from 09.00 a.m. to 12.00 a.m.

9:06 a.m.	**hypovolemic / distributive shock**. Sedation with propofol 0.6 mg / kg / h (pEEG). **PaO2/FiO2 116** **SAP/DAP 70/40 mmHg with norepinephrine at 0.9 mcg/kg/min**. **vasopressin 0.7 U/h** Lactate 7 mmol/L B.T. **38** ° C. **PCT 3.61** **Bilirubin 2 mg/dl**. **Diuresis about 60 ml/h**

23:21	The patient is always sedated and in serious clinical conditions, hemodynamics with SAP 80 mmHg supported by **norepinephrine (1 mcg / kg / min)**, and **vasopressin (0.6 U / h)**. Firm abdominal drainage not supplying blood. Transfusion: **3 U of Erytro, 2gr Fibrinogen, 2 U of Plasma, 2 U Plt**.

FIBTEM 3



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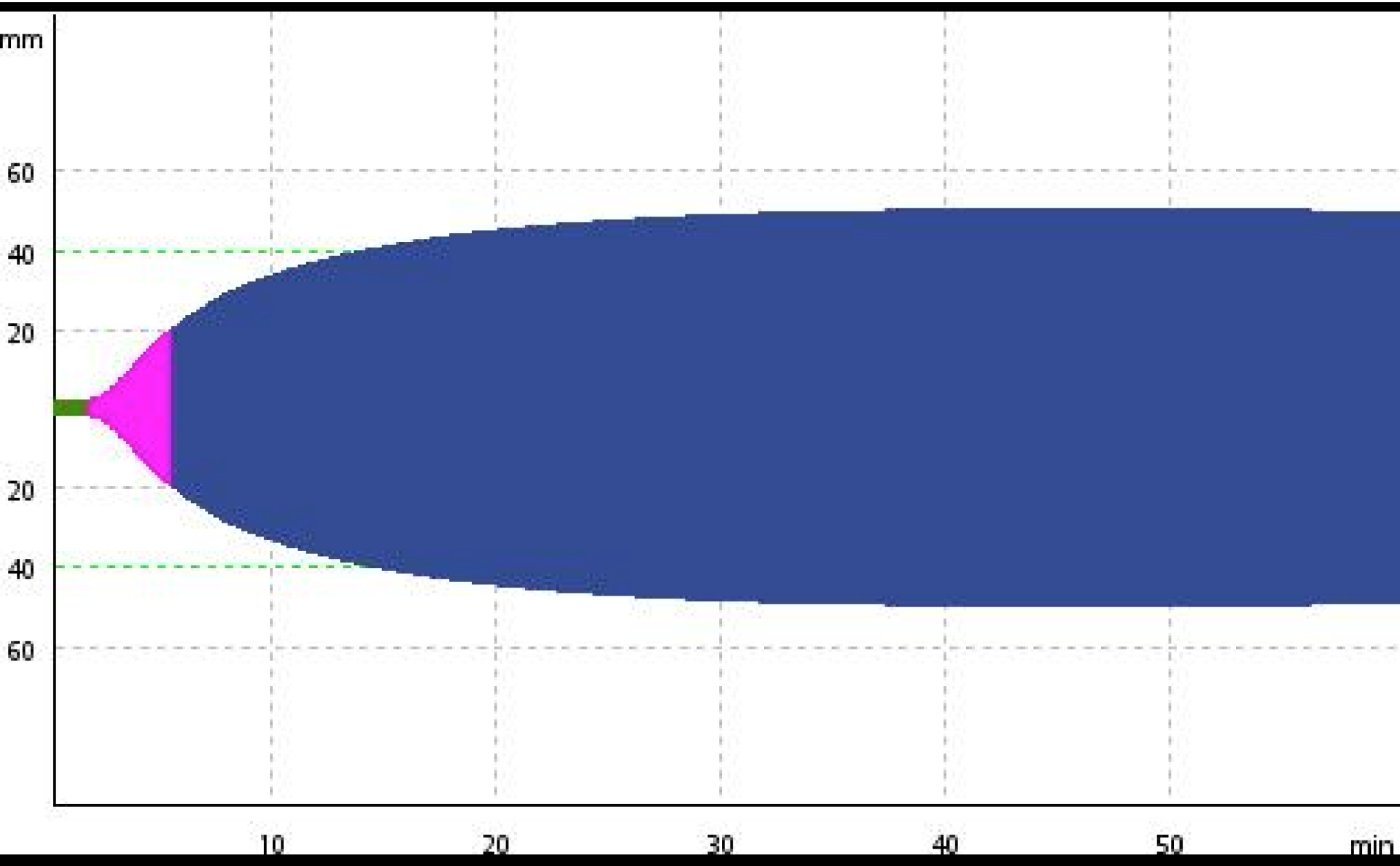

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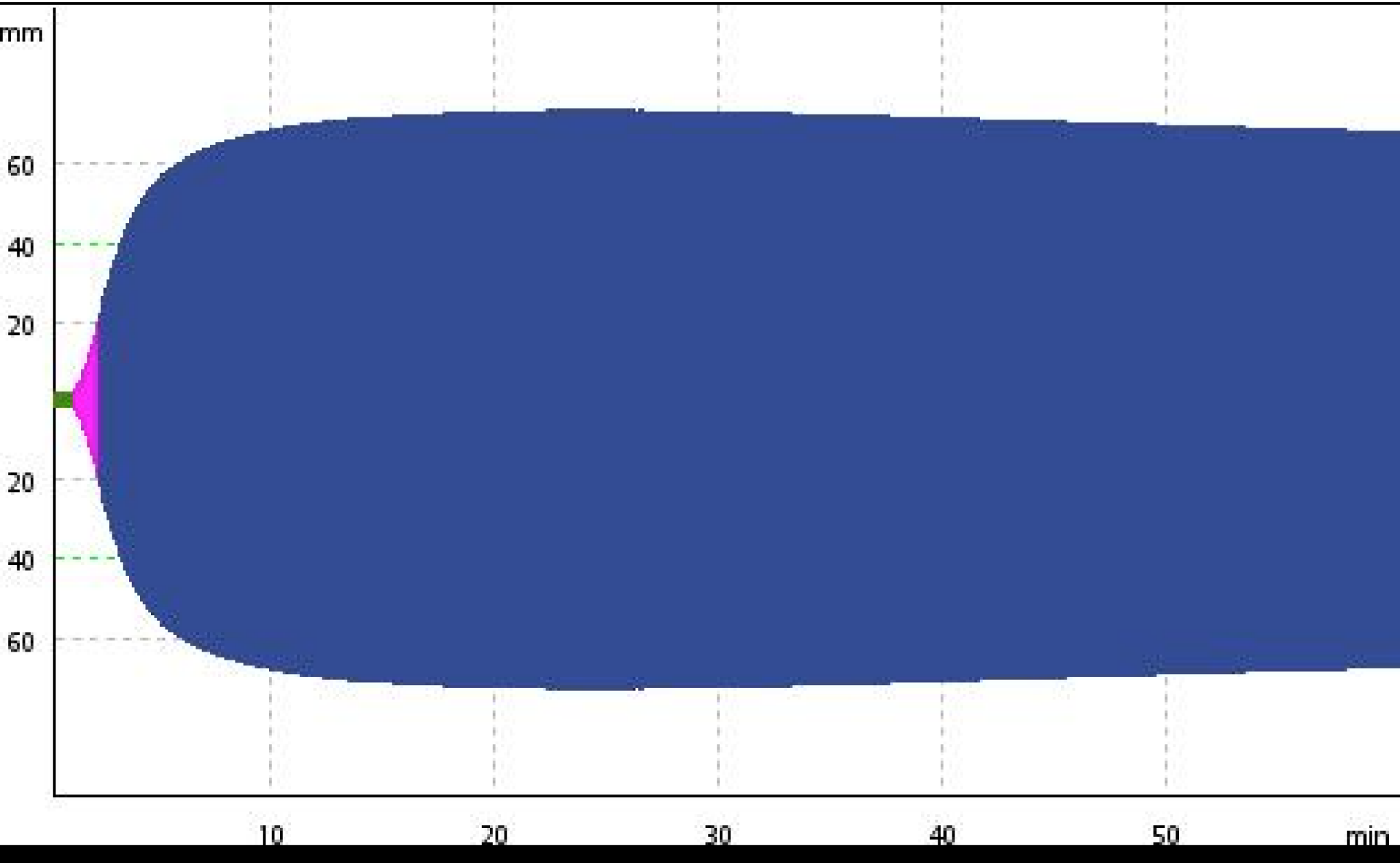
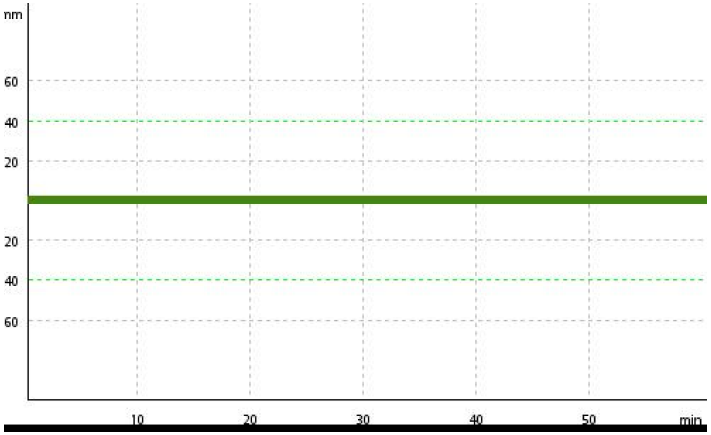
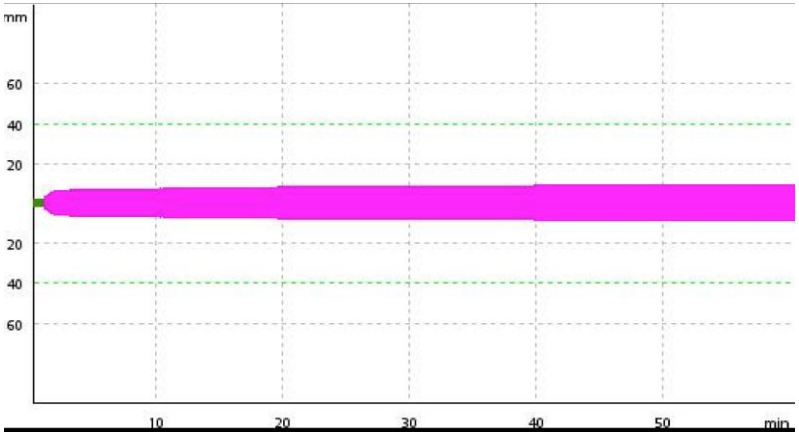


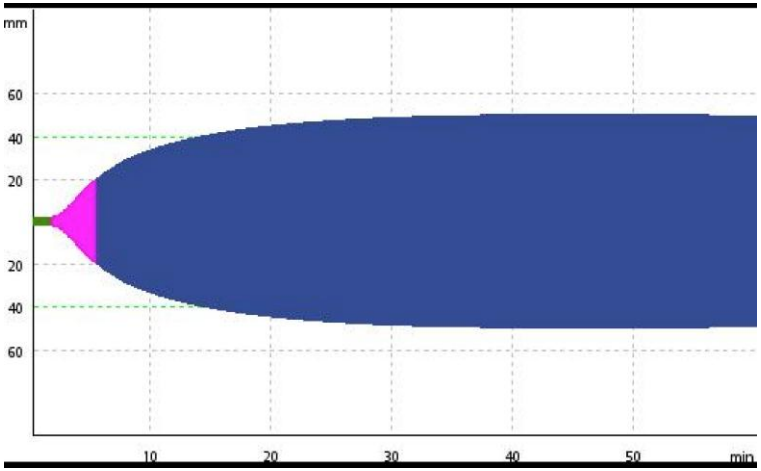
FbG (c.ca 6 g) + II-V-VII-IX-X (3000 UI) + FFP + GRC

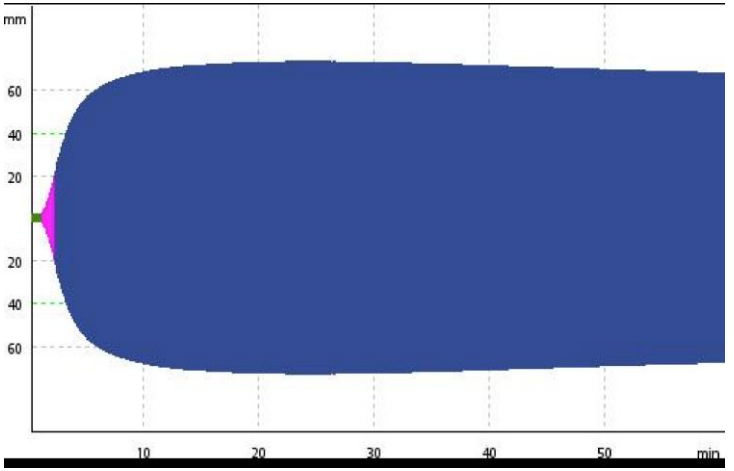
Fibtem





EXTEM





Intensive Care Unit - 11 April

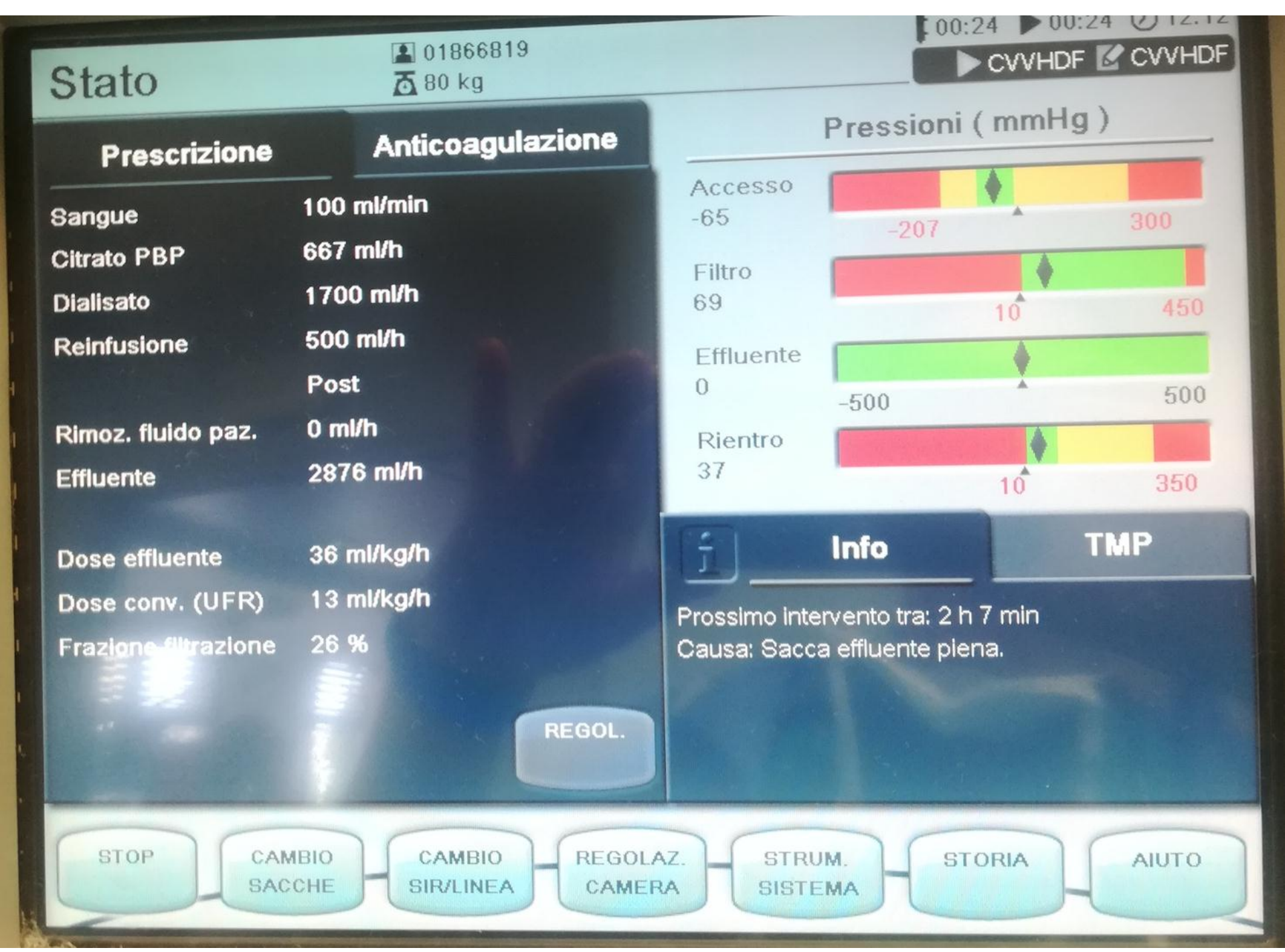
10:25 Severe clinical **conditions: hypovolemic/septic mixed shock (PCT 463 ng/ml).**
PA 85/40 mmHg with norepinephrine 0.9 mcg/Kg/min and vasopressin 0.7 U/h.

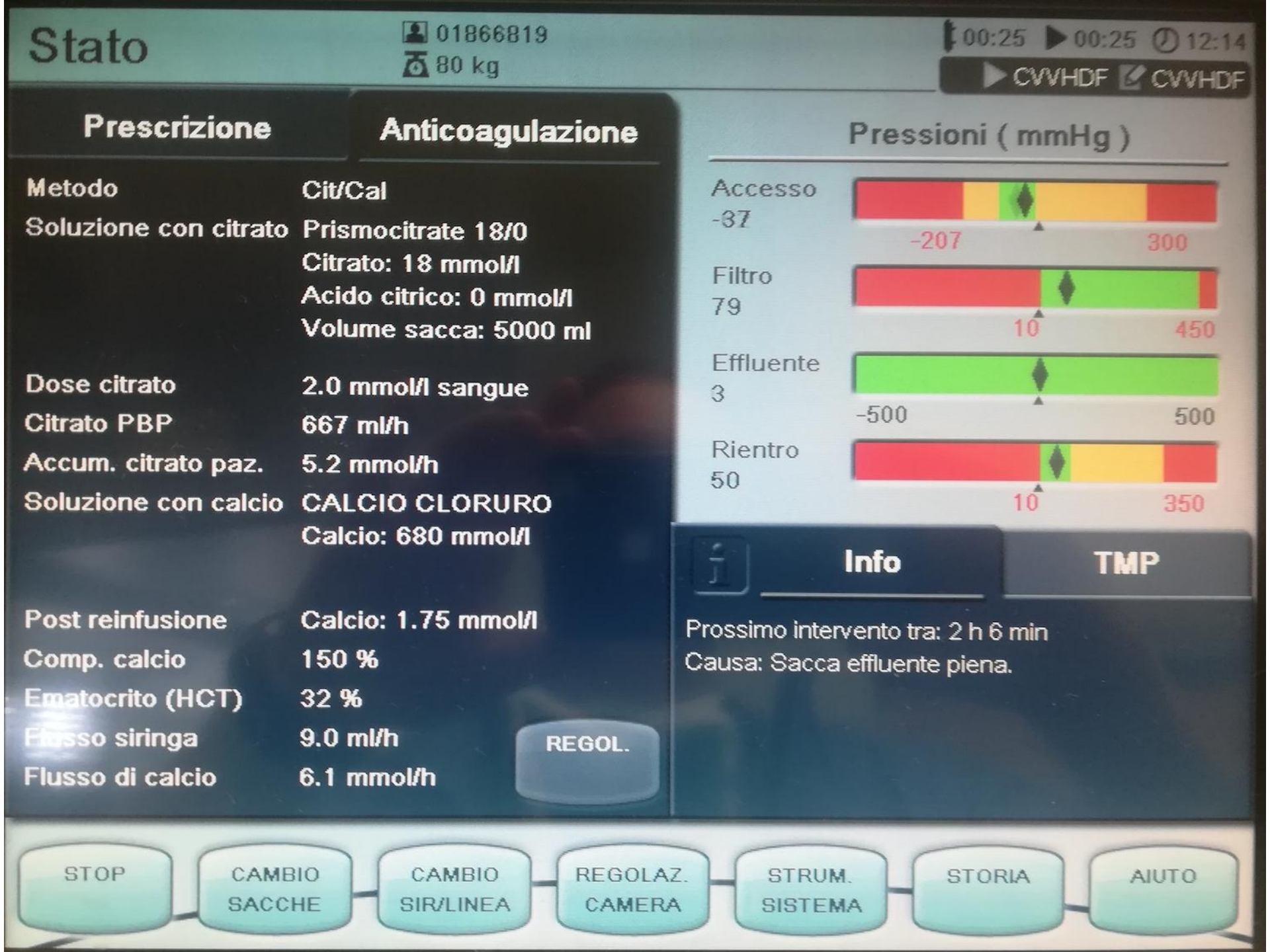
SOFA 17
APACHEII 35

Worsening of **oxygenation** with objective signs of **fluid overload**

Oliguric with maximal stimulus.

AKI stage 3.


00:24
00:24
Stato
01866819
80 kg
CVVHDF
CVVHDF
Prescrizione
Anticoagulazione
Sangue 100 ml/min
Citrato PBP 667 ml/h
Dialisato 1700 ml/h
Reinfusione 500 ml/h
Post
Rimoz. fluido paz. 0 ml/h
Effluente 2876 ml/h
Dose effluente 36 ml/kg/h
Dose conv. (UFR) 13 ml/kg/h
Frazione filtrazione 26 %
REGOL.
Pressioni (mmHg)
Accesso
-65
-207
300
Filtro
69
10
450
Effluente
0
-500
500
Rientro
37
10
350
Info
TMP
Prossimo intervento tra: 2 h 7 min
Causa: Sacca effluente piena.
STOP
CAMBIO SACCHE
CAMBIO SIR/LINEA
REGOLAZ. CAMERA
STRUM. SISTEMA
STORIA
AIUTO


Stato
01866819
80 kg
00:25
00:25
12:14
CVVHDF
CVVHDF
Prescrizione
Anticoagulazione
Metodo
Cit/Cal
Soluzione con citrato
Prismocitrate 18/0
Citrato: 18 mmol/l
Acido citrico: 0 mmol/l
Volume sacca: 5000 ml
Dose citrato
2.0 mmol/l sangue
Citrato PBP
667 ml/h
Accum. citrato paz.
5.2 mmol/h
Soluzione con calcio
CALCIO CLORURO
Calcio: 680 mmol/l
Post reinfusione
Calcio: 1.75 mmol/l
Comp. calcio
150 %
Ematocrito (HCT)
32 %
Flusso siringa
9.0 ml/h
Flusso di calcio
6.1 mmol/h
REGOL.
Pressioni (mmHg)
Accesso
-37
-207
300
Filtro
79
10
450
Effluente
3
-500
500
Rientro
50
10
350
Info
TMP
Prossimo intervento tra: 2 h 6 min
Causa: Sacca effluente piena.
STOP
CAMBIO SACCHE
CAMBIO SIR/LINEA
REGOLAZ. CAMERA
STRUM. SISTEMA
STORIA
AIUTO

1) Bilirubin 3.65 mg/dl
2) Lac 7.1 mmol/L
3) Ca/Ca^{2+}=1.9

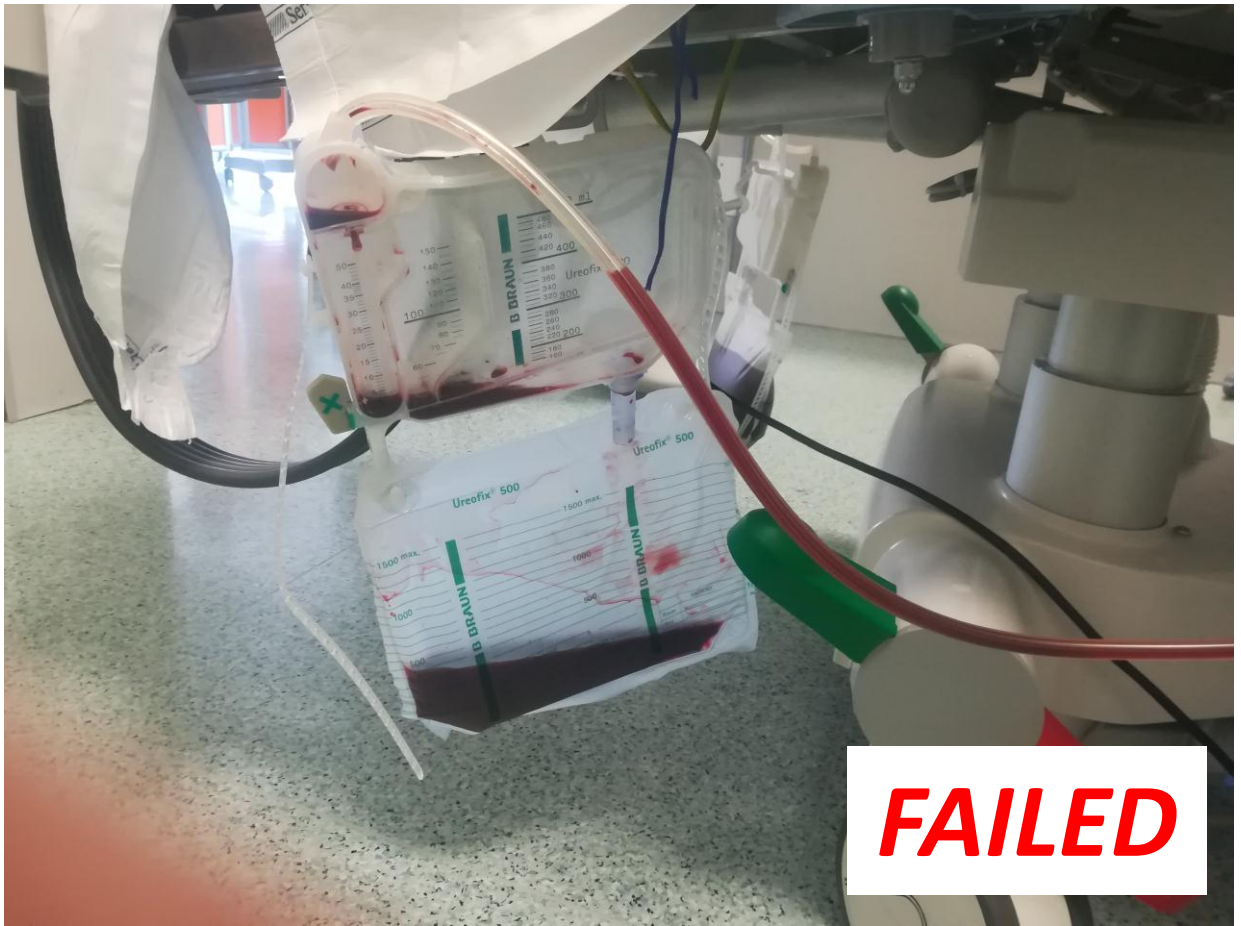
Citrate accumulation or overload

(management)

1) Decreasing Q_B (decreases intake) through blood flow–citrate coupling or
2) Increasing Q_D (CVVHD) or Q_R (CVVH) (increases removal), or
3) Decreasing the targeted citrate concentration within the filter.

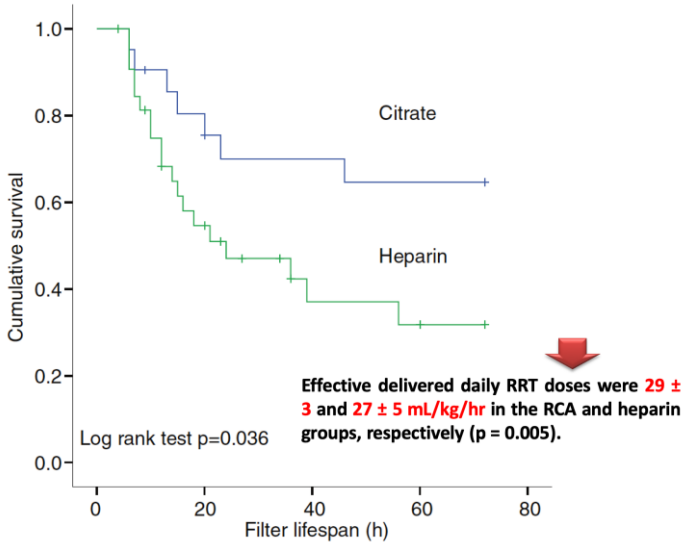
Intensive Care Unit - 14 April

10:44	Not electrolytic or acid / base alterations. **Furosemide stress test (lasix 125 mg),**



1) Bilirubin 7 mg/dl
2) Lac 8 mmol/L

Anticoagulation strategy?



Effective delivered daily RRT doses were 29 ± 3 and 27 ± 5 mL/kg/hr in the RCA and heparin groups, respectively (p = 0.005).

Stucker et al. Critical Care (2015) 19:91

Systemic Heparin

Clotting after 6 hrs