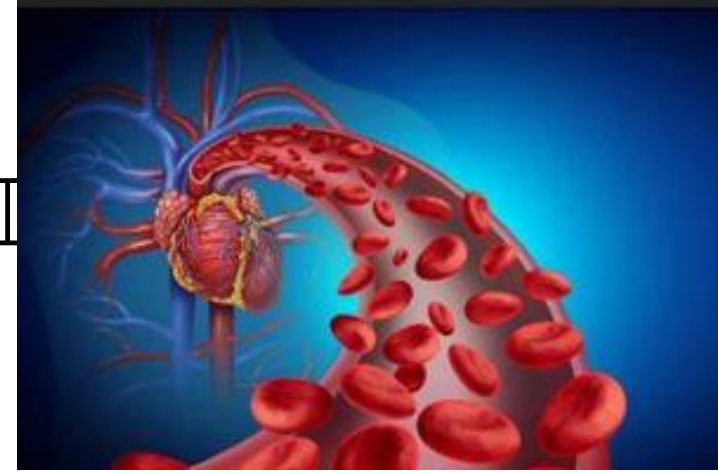


▸ Monitoreo hemodinámico II

Pablo Donati
Universidad de Buenos Aires.
Cátedra de Anestesiología y
algología
UCICCOOP



Monitoreo hemodinámico I



- Fisiología aplicada
- Importancia del control de la presión arterial
- Evaluación de la respuesta fluidos

Alcanza con normalizar la
volemia y la presión arterial?

- A- Si



- B- No

Maurizio Cecconi
Daniel De Backer
Massimo Antonelli
Richard Beale
Jan Bakker
Christoph Hofer
Roman Jaeschke
Alexandre Mebazaa
Michael R. Pinsky
Jean Louis Teboul
Jean Louis Vincent
Andrew Rhodes

Consensus on circulatory shock and hemodynamic monitoring. Task force of the European Society of Intensive Care Medicine

Shock is best defined as a life-threatening, generalized form of acute circulatory failure associated with inadequate oxygen utilization by the cells. It is a state in which the circulation is unable to deliver sufficient oxygen to meet the demands of the tissues, resulting in cellular dysfunction. The result is cellular dysoxia, i.e. the loss of the physiological independence between oxygen delivery and oxygen consumption, associated with increased lactate levels. Some clinical symptoms suggest an impaired microcirculation, including mottled skin, acrocyanosis, slow capillary refill time and an increased central-to-toe temperature gradient.

Decreased central venous oxygen saturation despite normalization of heart rate and blood pressure post shock resuscitation in sick dogs

Brian C. Young, VMD, DACVIM, DACVECC; Jennifer E. Prittie, DVM, DACVIM, DACVECC;
Philip Fox, DVM, DACVIM, DACVECC and Linda J. Barton, DVM, DACVECC

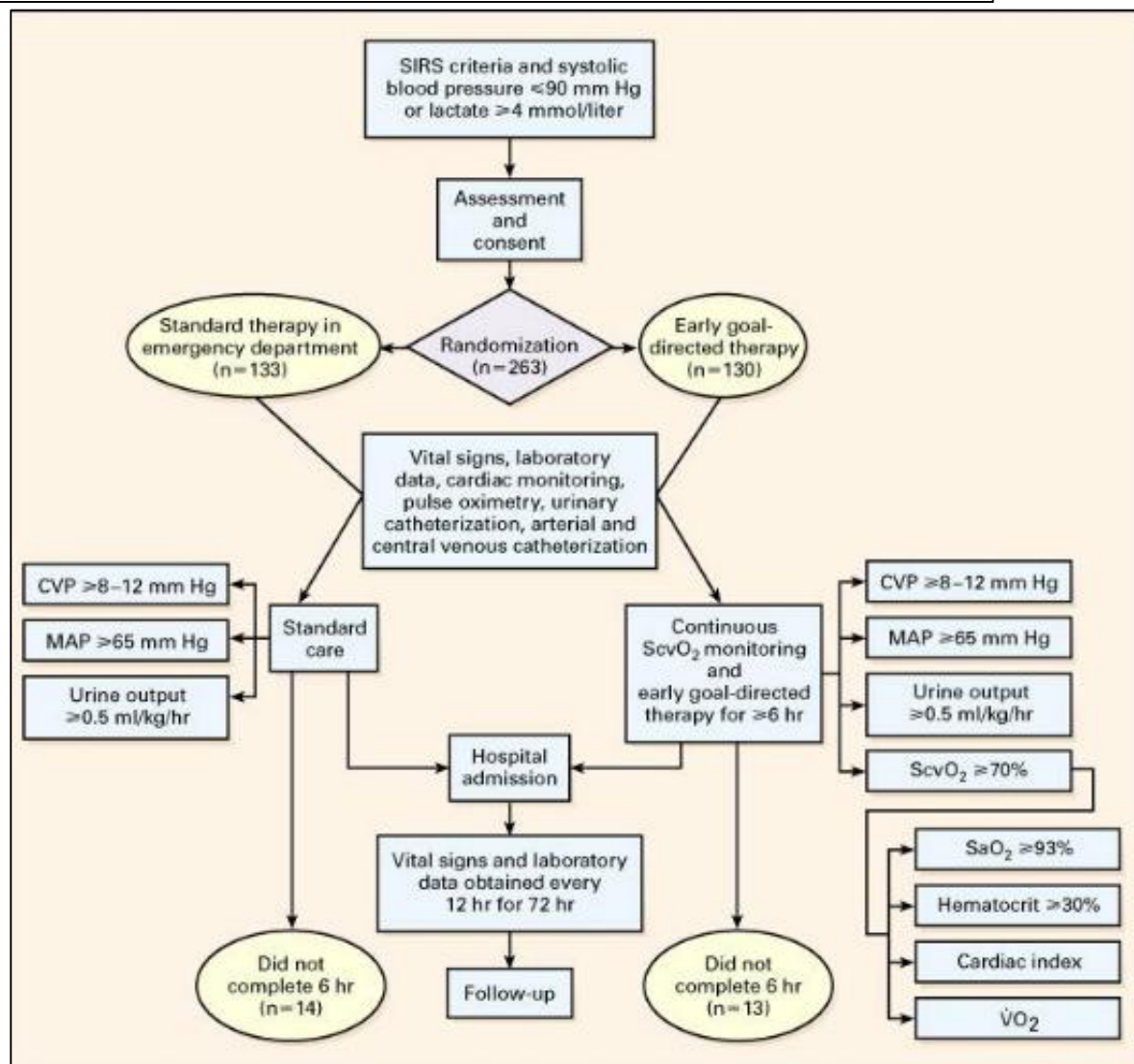
Conclusions – Decreased ScvO₂ exists in a significant proportion of critically ill dogs following standard fluid resuscitation for shock, providing a relevant target population for implementation of a more standardized early goal-directed therapy bundle in veterinary patients. Normalization of heart rate, blood pressure, mentation, and perfusion parameters directed by physical examination may be attained despite the persistence of significant tissue hypoperfusion and oxygen debt.

Resucitación hemodinámica inicial



Early Goal-Directed Therapy in the Treatment of Severe Sepsis and Septic Shock

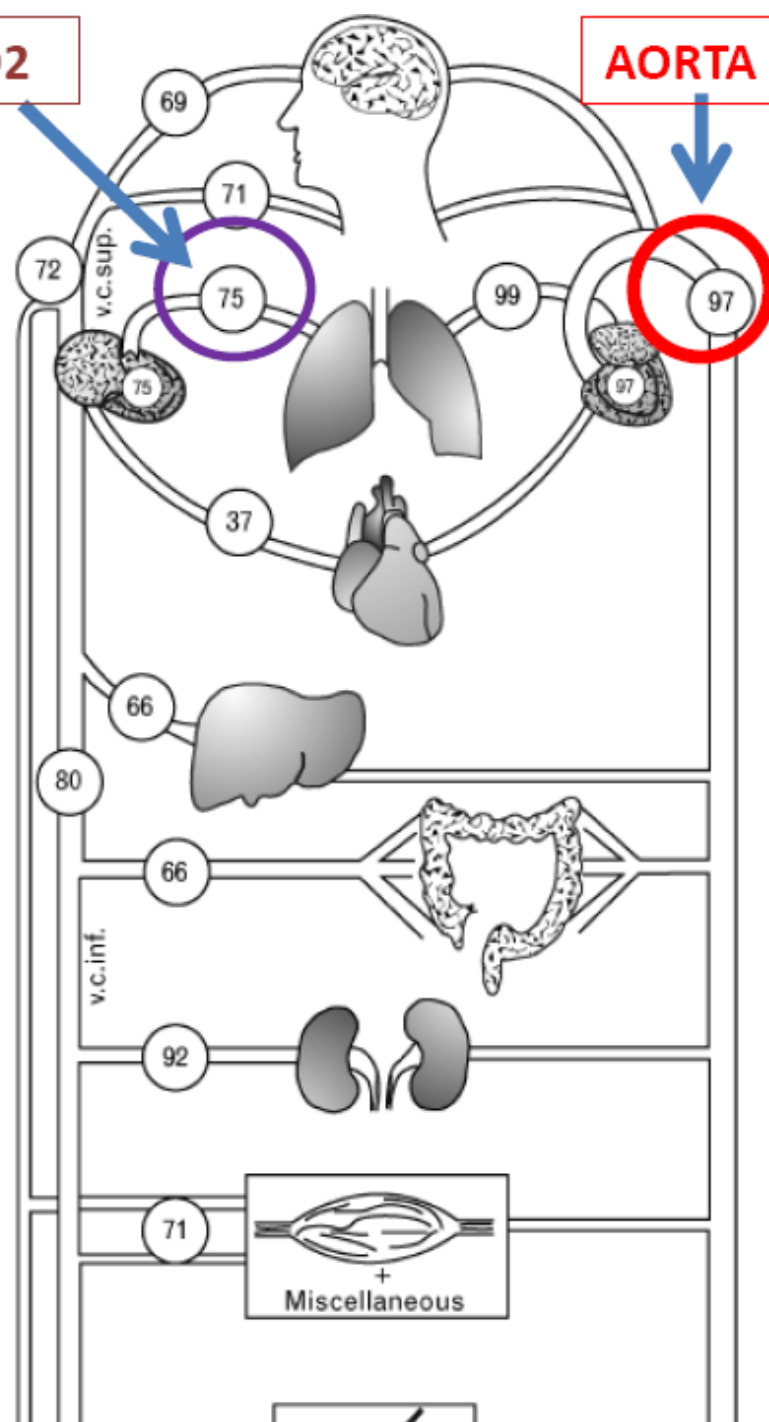
Emanuel Rivers, M.D., M.P.H., Bryant Nguyen, M.D., Suzanne Havstad, M.A., Julie Ressler, B.S., Alexandria Muzzin, B.S., Bernhard Knoblich, M.D., Edward Peterson, Ph.D., and Michael Tomlanovich, M.D., for the Early Goal-Directed Therapy Collaborative Group*



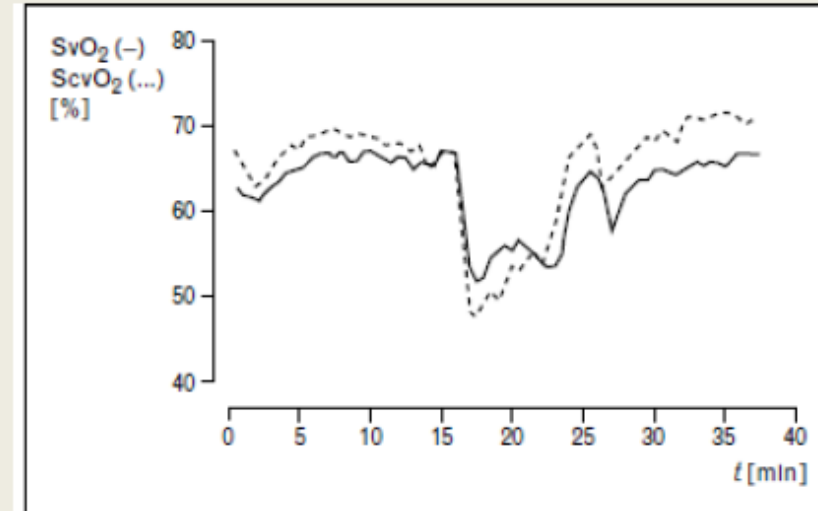


SvO₂

AORTA



SvO₂= Sat venosa mixta .Distal de Swan Ganz
ScvO₂= Sat venosa mixta por cateter central



Venous oximetry

Gernot Marx and Konrad Reinhart

Nivel SvO₂

Consecuencia.

>75%

NORMAL

75%-50%

> Demanda <Oferta de O₂

<50%-30%

Célula exhausta

<30%-25%

Acidosis severa

25%

Muerte celular.

PEDIATRIC ORIGINAL

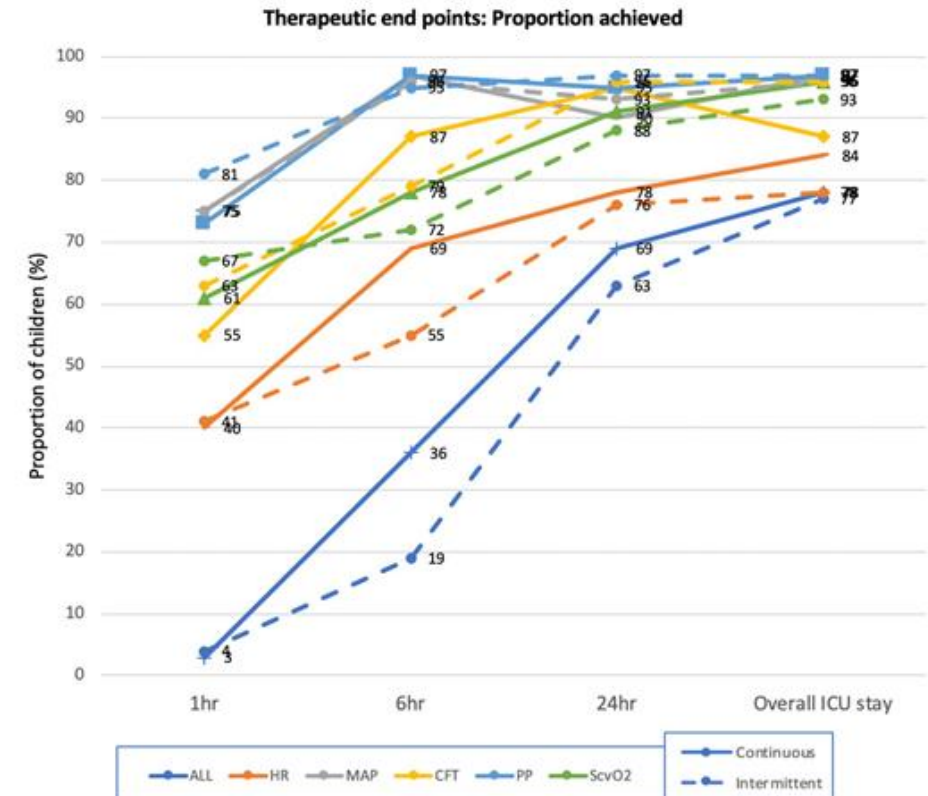
'Intermittent' versus 'continuous' ScvO₂ monitoring in children with septic shock: a randomised, non-inferiority trial

Jhuma Sankar^{*} , Man Singh, Kiran Kumar, M. Jeeva Sankar, Sushil Kumar Kabra and Rakesh Lodha



Intervention

1. Experimental arm— 'intermittent ScvO₂' monitoring group: a central venous catheter (CVC) was inserted for monitoring the central venous pressure (CVP) and samples were drawn at 1, 3 and 6 h of initial resuscitation from the distal lumen of the catheter for estimation of central venous oxygen saturation (ScvO₂). The blood gas sample was processed by using basic blood gas analyser ABL 800 (Radiometer, Copen- Hagen, Germany). The study team used this information to give fluid, blood, and heart medications as described in Electronic supplement 3.



JAMA. 2010 February 24; 303(8): 739–746. doi:10.1001/jama.2010.158.

Lactate Clearance vs Central Venous Oxygen Saturation as Goals of Early Sepsis Therapy: A Randomized Clinical Trial

Dr. Alan E. Jones, MD, Dr. Nathan I. Shapiro, MD, MPH, Dr. Stephen Trzeciak, MD, MPH, Dr. Ryan C. Arnold, MD, Ms. Heather A. Claremont, BFA, and Dr. Jeffrey A. Kline, MD for the Emergency Medicine Shock Research Network (EMShockNet) Investigators

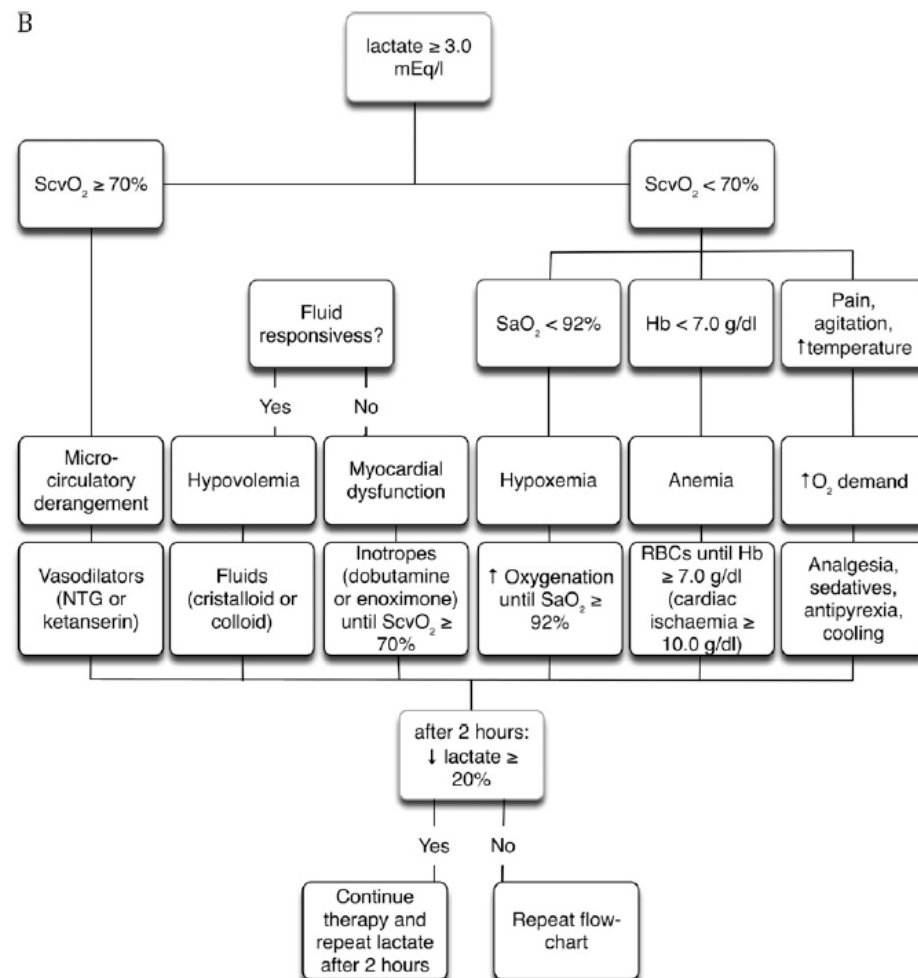
Hospital Mortality and Length of Stay

Variable	Lactate Clearance Group (n = 150)	ScvO ₂ Group (n = 150)	Proportion Difference (95% Confidence Interval)	P Value ^b
In-hospital mortality, No. (%) ^a	25 (17)	34 (23)	6 (–3 to 15)	
Intent to treat				
Per protocol	25 (17)	33 (22)	5 (–3 to 14)	
Length of stay, mean (SD), d	5.9 (8.46)	5.6 (7.39)		.75
ICU				
Hospital	11.4 (10.89)	12.1 (11.68)		.60
Hospital complications				
Ventilator-free days, mean (SD)	9.3 (10.31)	9.9 (11.09)		.67
Multiple organ failure, No. (%)	37 (25)	33 (22)		.68
Care withdrawn, No. (%)	14 (9)	23 (15)		.15

Early Lactate-Guided Therapy in Intensive Care Unit Patients

A Multicenter, Open-Label, Randomized Controlled Trial

Tim C. Jansen¹, Jasper van Bommel¹, F. Jeanette Schoonderbeek³, Steven J. Sleeswijk Visser⁴, Johan M. van der Klooster⁵, Alex P. Lima¹, Sten P. Willemsen², and Jan Bakker¹, for the LACTATE study group*



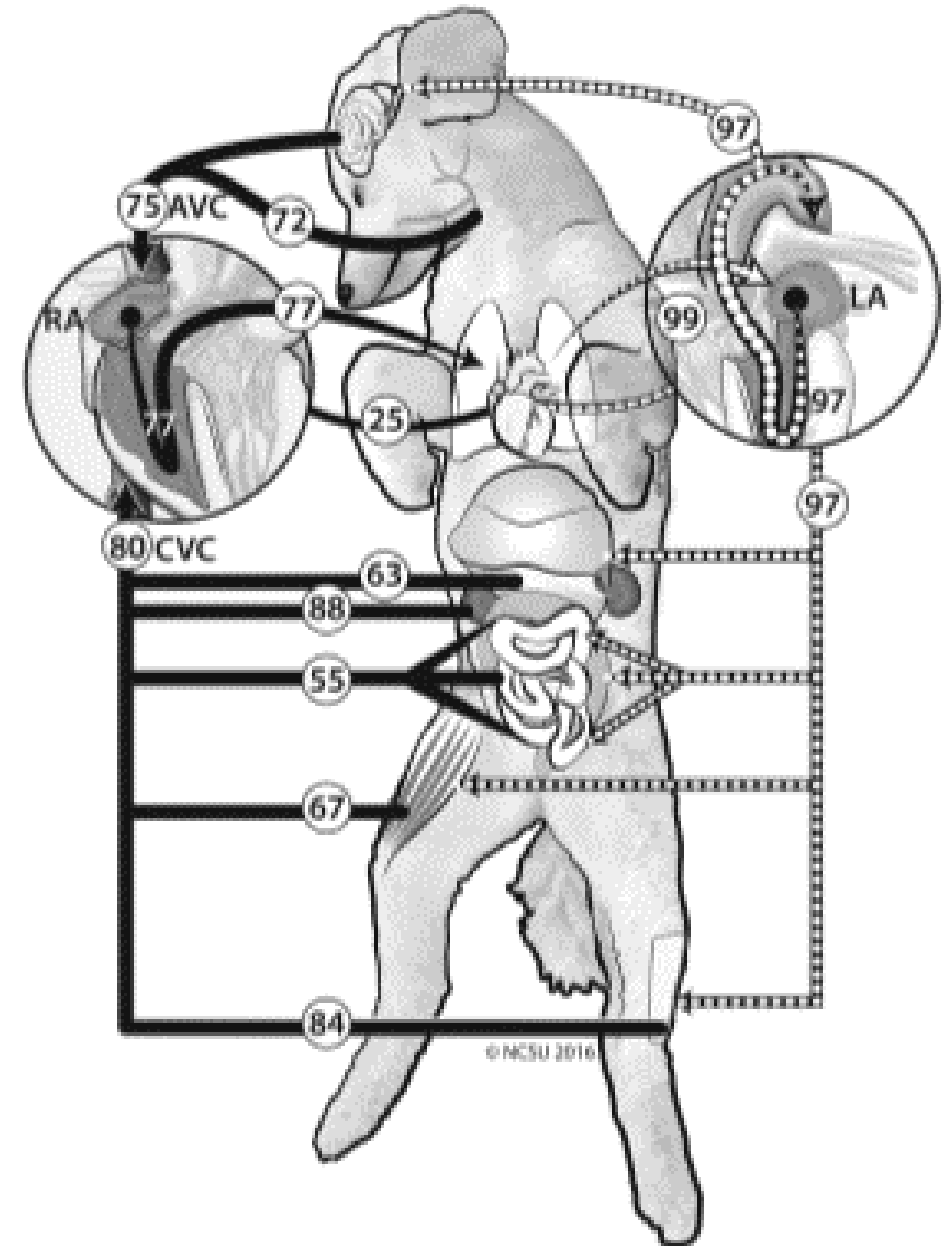


Clinical Practice Review

Journal of Veterinary Emergency and Critical Care 00(0) 2018, pp 1–11
doi: 10.1111/vec.12749

Venous oxygen saturation in critical illness

Rebecca A.L. Walton, DVM, DACVECC and Bernie D. Hansen, DVM, MS, DACVECC, DACVIM





Original Study

Journal of Veterinary Emergency and Critical Care 22(4) 2012, pp 402–418
doi: 10.1111/j.1478-4431.2012.00789.x

Changes in tissue perfusion parameters in dogs with severe sepsis/septic shock in response to goal-directed hemodynamic optimization at admission to ICU and the relation to outcome

Andreza Conti-Patara, DVM, MSc, PhD; Juliana de Araújo Caldeira, DVM; Ewaldo de Mattos-Junior, DVM, MS; Haley da Silva de Carvalho, DVM, MSc; Adriane Reinoldes, DVM; Bruno Gregnarin Pedron, DVM; Marcelo Patara, MD; Mariana Semão Francisco Talib, DVM; Marcelo Faustino, DVM; Clair Motos de Oliveira, DVM, MSc, PhD and Silvia Renata Gaido Cortopassi, DVM, MSc, PhD

Thirty dogs

Parameters
upon ICU
admission

Cut-
off points

Sensitivity

Specificity

Accuracy

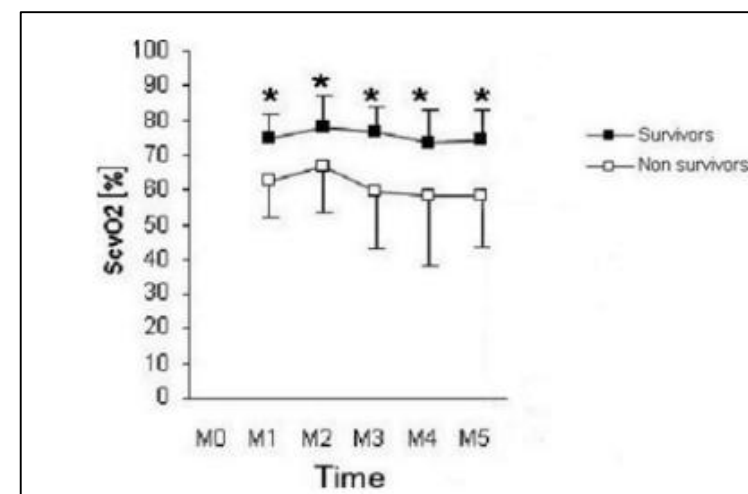
ScvO₂ (%)

52

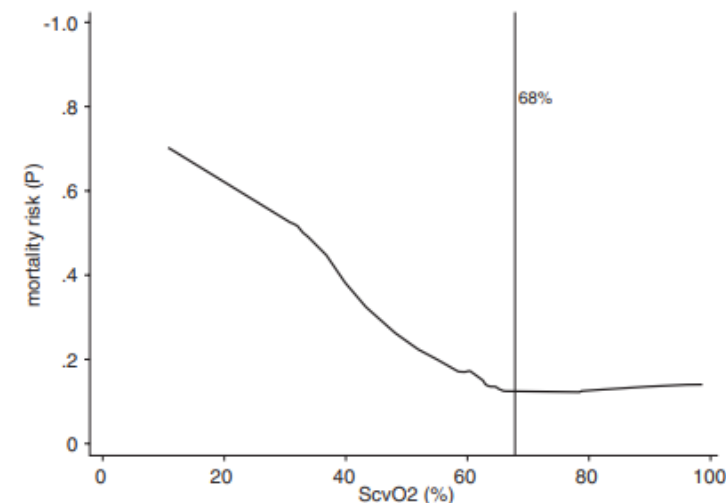
64.5%

100%

83.3%



126 client-owned dogs



JSAP

JOURNAL OF
SMALL ANIMAL
PRACTICE

Low central venous oxygen saturation is associated with increased mortality in critically ill dogs

G. M. Hayes², K. Mathews¹, S. Boston³
and C. Dewey⁴

Issue

Received: 1 March 2021 | Revised: 26 May 2021 | Accepted: 30 June 2021
DOI: 10.1111/vec.13232

RETROSPECTIVE STUDY



Retrospective evaluation of jugular venous blood variables and mortality in critically ill hospitalized cats

Pablo A. Donati MS, DVM^{1,2} | Rodrigo Cardoso Rabelo PhD, MS, DVM³ |
Joaquin Araos PhD, DVM⁴ | Marcela Tunesi DVM² | Javier Mouly DVM⁵ |
Leonel Londoño DVM, DACVECC⁶ | Mario Jensen DVM² | Arnaldo Dubin PhD, MD⁷

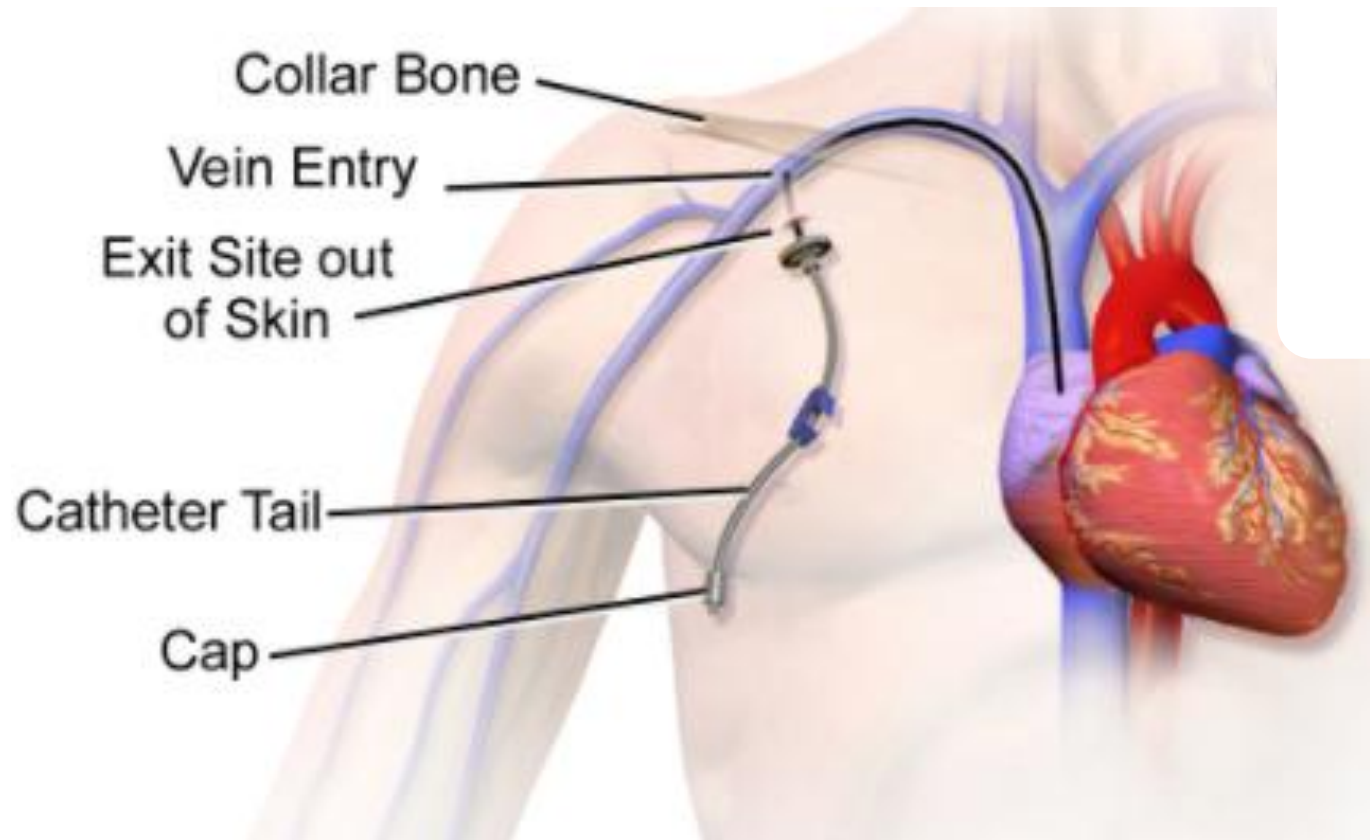
Whole population (n = 57)			
Variable	Odds ratio	95% CI	P-value
HCT	0.763	[0.625–0.931]	0.008
PjvO ₂	0.917	[0.846–0.995]	0.037
APPLE fast score	1.142	[0.960–1.357]	0.132
Category of illness			
Renal (Basal)			
Hepatobiliary	0.890	[0.085–9.315]	0.923
Gastrointestinal-pancreatic	0.890	[0.071–11.028]	0.928
Metabolic-endocrine	1.383	[0.055–34.377]	0.843
Others	0.285	[0.038–2.091]	0.217

Surviving Sepsis Campaign: International Guidelines for Management of Severe Sepsis and Septic Shock: 2012

A. Initial Resuscitation

1. Protocolized, quantitative resuscitation of patients with sepsis-induced tissue hypoperfusion (defined in this document as hypotension persisting after initial fluid challenge or blood lactate concentration ≥ 4 mmol/L). Goals during the first 6 hrs of resuscitation:
 - a) Central venous pressure 8–12 mm Hg
 - b) Mean arterial pressure (MAP) ≥ 65 mm Hg
 - c) Urine output ≥ 0.5 mL/kg/hr
 - d) Central venous (superior vena cava) or mixed venous oxygen saturation 70% or 65%, respectively (grade 1C).
2. In patients with elevated lactate levels targeting resuscitation to normalize lactate (grade 2C).
3. In patients with elevated lactate levels targeting resuscitation to normalize lactate (grade 2C):
 - a) Central venous (superior vena cava) or mixed venous oxygen saturation 70% or 65%, respectively (grade 1C).
 - b) Urine output ≥ 0.5 mL/kg/hr
 - c) Mean arterial pressure (MAP) ≥ 65 mm Hg

Cuestionamiento como “Target de resucitación”





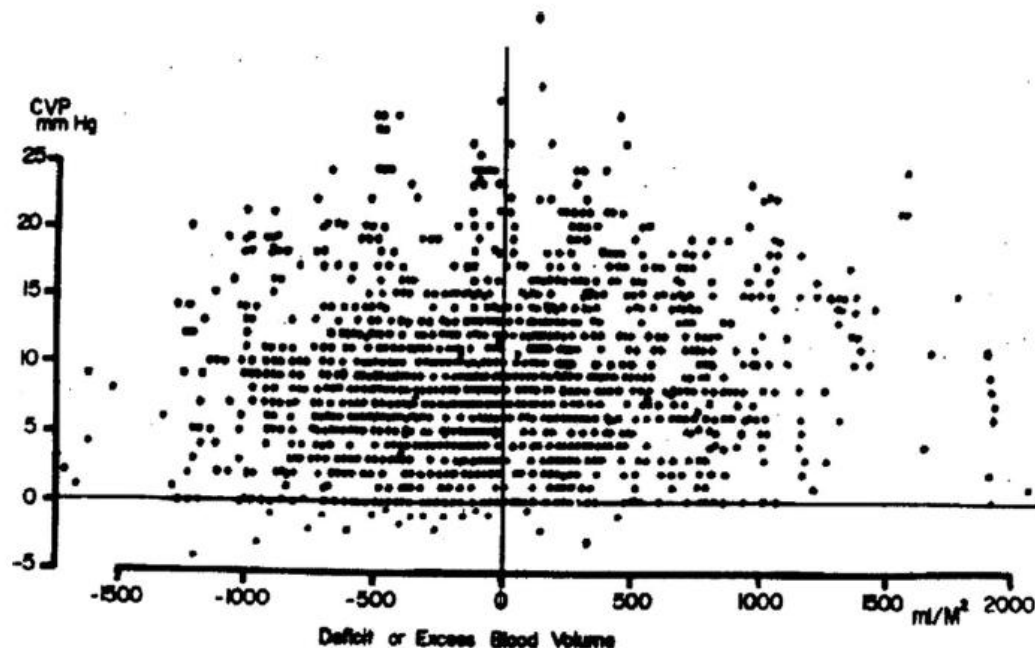
CHEST

Special Feature

Does Central Venous Pressure Predict Fluid Responsiveness?*

A Systematic Review of the Literature and the Tale of Seven Mares

Paul E. Marik, MD, FCCP; Michael Baram, MD, FCCP; and Bobbak Vahid, MD



Maurizio Cecconi
Daniel De Backer
Massimo Antonelli
Richard Beale
Jan Bakker
Christoph Hofer
Roman Jaeschke
Alexandre Mebazaa
Michael R. Pinsky
Jean Louis Teboul
Jean Louis Vincent
Andrew Rhodes

**Consensus on circulatory shock
and hemodynamic monitoring. Task force
of the European Society of Intensive Care
Medicine**

Valores muy bajos (cerca de cero): seguro es
respondedor a fluidos

Valores muy altos (cerca de 10): seguro no responde

Valores intermedios: Evaluar comportamiento ante una
carga de fluidos

EGDT vs UC



APACHE II 20 vs 21
46% vs 30%

	ProCESS 			ARISE 		ProMiSe 	
	EGDT	PB-ST	UC	EGDT	UC	EGDT	UC
APACHE II	20.8	20.6	20.7	15.4	15.8	18.7	18
Mortality	21%	18%	18.9%	18.6%	18.8%	29.5%	29.2%

Svo2 al ingreso mayor a 70 % en los tres trials

Objetivo de normalizar lactato

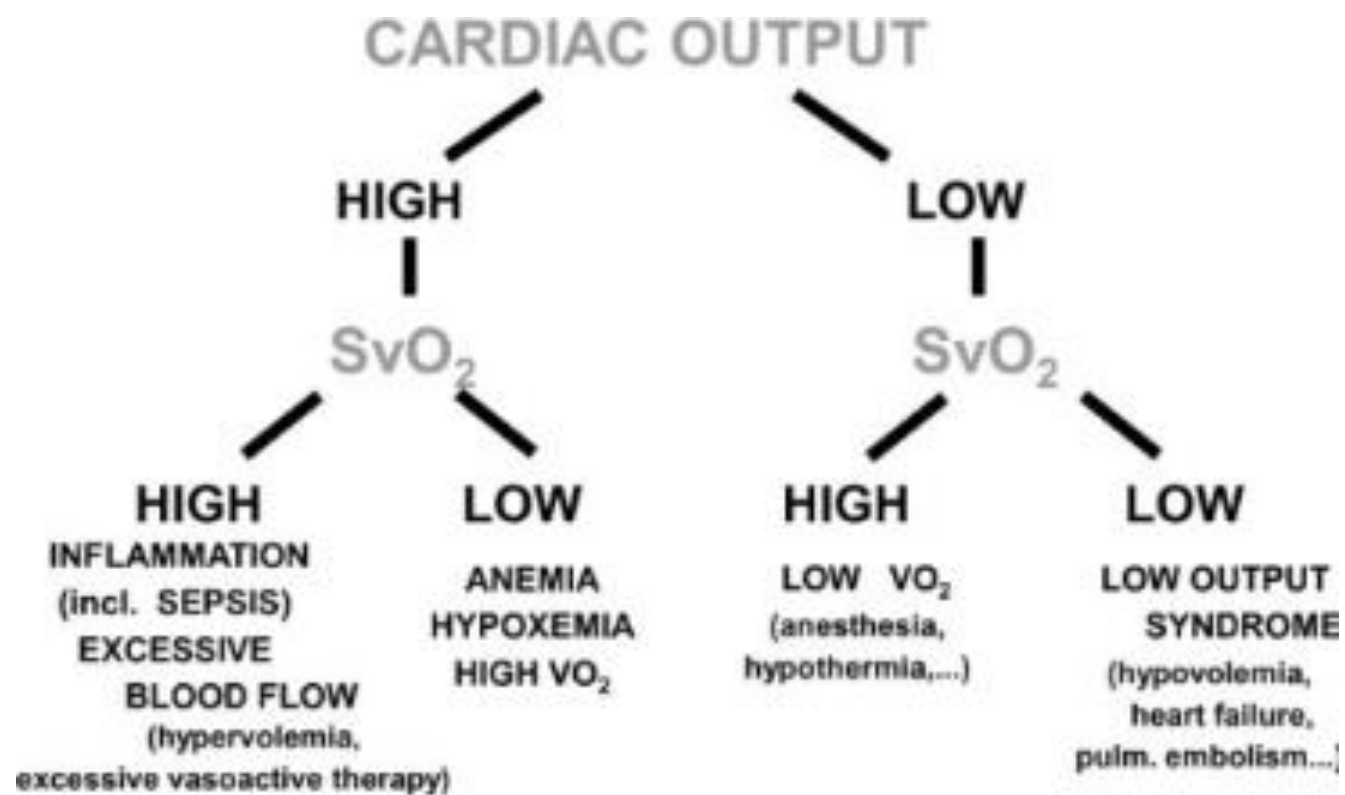


Una SvO₂ mayor a 70% garantiza que no hay hipoxia tisular?

- A- Si

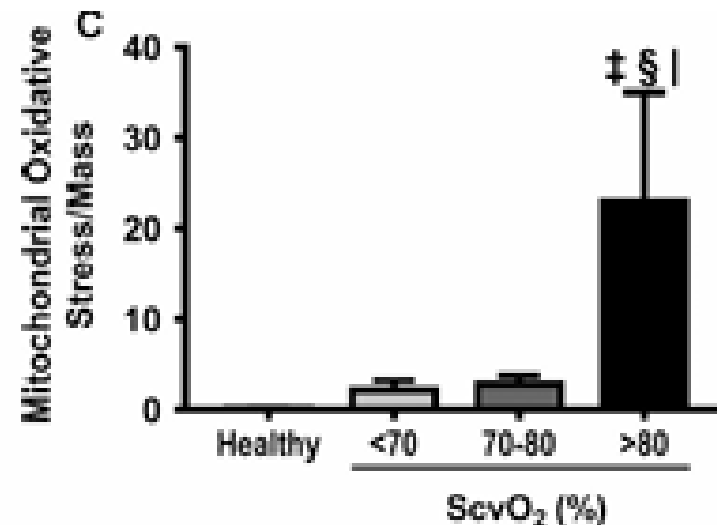
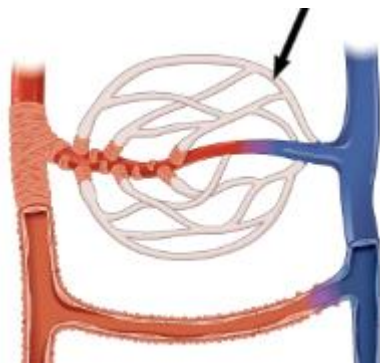


- B- No



High central venous oxygen saturation is associated with mitochondrial dysfunction in septic shock: A prospective observational study

Borwon Wittayachamnankul^{1,2,3} | Nattayaporn Apaijai^{2,3} | Krongkarn Sutham¹ |
Boriboon Chenthanakij¹ | Chalerm Liwsrisakun⁴ | Thidarat Jaiwongkam^{2,3} |
Siriporn C. Chattipakorn^{2,3} | Nipon Chattipakorn^{2,3,5} 



Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016

A. INITIAL RESUSCITATION

1. Sepsis and septic shock are medical emergencies, and we recommend that treatment and resuscitation begin immediately (BPS).
2. We recommend that, in the resuscitation from sepsis-induced hypoperfusion, at least 30 mL/kg of IV crystalloid fluid be given within the first 3 hours (strong recommendation, low quality of evidence).
3. We recommend that, following initial fluid resuscitation, additional fluids be guided by frequent reassessment of hemodynamic status (BPS).
Remarks: Reassessment should include a thorough clinical examination and evaluation of available physiologic variables (heart rate, blood pressure, arterial oxygen saturation, respiratory rate, temperature, urine output, and others, as available) as well as other noninvasive or invasive monitoring, as available.
4. We recommend further hemodynamic assessment (such as assessing cardiac function) to determine the type of shock if the clinical examination does not lead to a clear diagnosis (BPS).
5. We suggest that dynamic over static variables be used to predict fluid responsiveness, where available (weak recommendation, low quality of evidence).
6. We recommend an initial target mean arterial pressure of 65 mm Hg in patients with septic shock requiring vasopressors (strong recommendation, moderate quality of evidence).
7. We suggest guiding resuscitation to normalize lactate in patients with elevated lactate levels as a marker of tissue hypoperfusion (weak recommendation, low quality of evidence).

μborefnzlon (weak recommendation, low quality of evidence).

7. We suggest guiding resuscitation to normalize lactate in patients with elevated lactate levels as a marker of tissue

GUIDELINES

Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021



VERY LOW

6

For adults with sepsis or septic shock, we **suggest** using dynamic measures to guide fluid resuscitation, over physical examination, or static parameters alone.

GUIDELINES

Surviving sepsis campaign: international guidelines for management of sepsis and septic shock 2021



LOW

7

For adults with sepsis or septic shock, we **suggest** guiding resuscitation to decrease serum lactate in patients with elevated lactate level, over not using serum lactate.



LOW

8

For adults with septic shock, we **suggest** using capillary refill time to guide resuscitation as an adjunct to other measures of perfusion.

Persistent Sepsis-Induced Hypotension without Hyperlactatemia: A Distinct Clinical and Physiological Profile within the Spectrum of Septic Shock

**Glenn Hernandez,^{1,2} Alejandro Bruhn,² Ricardo Castro,² Cesar Pedreros,²
Maximiliano Rovegno,² Eduardo Kattan,² Enrique Veas,² Andrea Fuentealba,²
Tomas Regueira,² Carolina Ruiz,² and Can Ince¹**

Hindawi Publishing Corporation
Critical Care Research and Practice
Volume 2012, Article ID 536852, 7 pages
doi:10.1155/2012/536852

	Total	Lactate < 2.5	Lactate ≥ 2.5
Number of patients	124	38	86
Age (y)	65 [53–75]	62 [39–73]	65 [58–75]
ICU LOS (d)	5 [3–9]	4.5 [2–7]	5 [3–10]
APACHE II score	18 [12–24]	12 [8–19]	20 [15–25]**
Basal SOFA score	8 [5–10]	6 [3–8]	9 [6–11]**
ICU mortality (%)	13.7	5.2	17.4*
Hospital mortality (%)	17.6	7.9	20.9*

Survival analysis of critically ill dogs with hypotension with or without hyperlactatemia: 67 cases (2006–2011)

Laura B. Ateca, VMD; Stefan C. Dombrowski, PhD; Deborah C. Silverstein, DVM

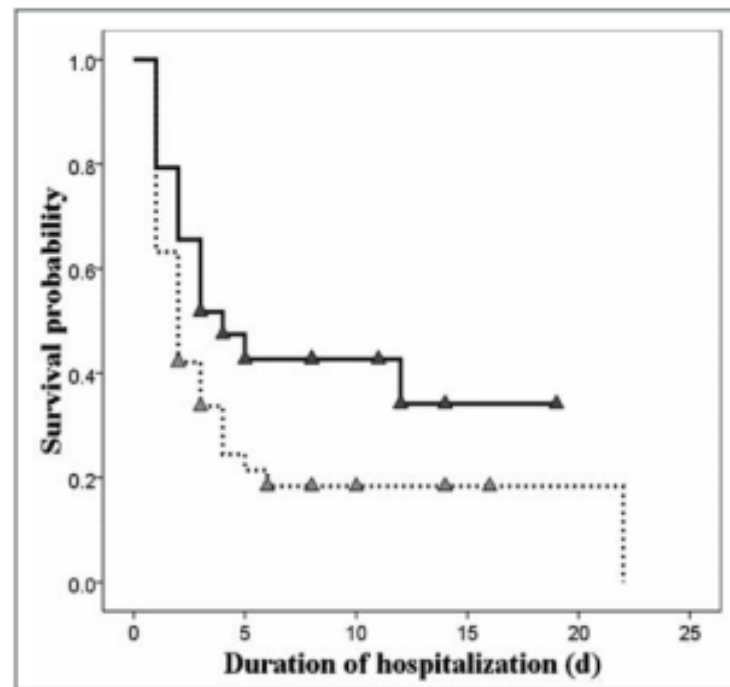


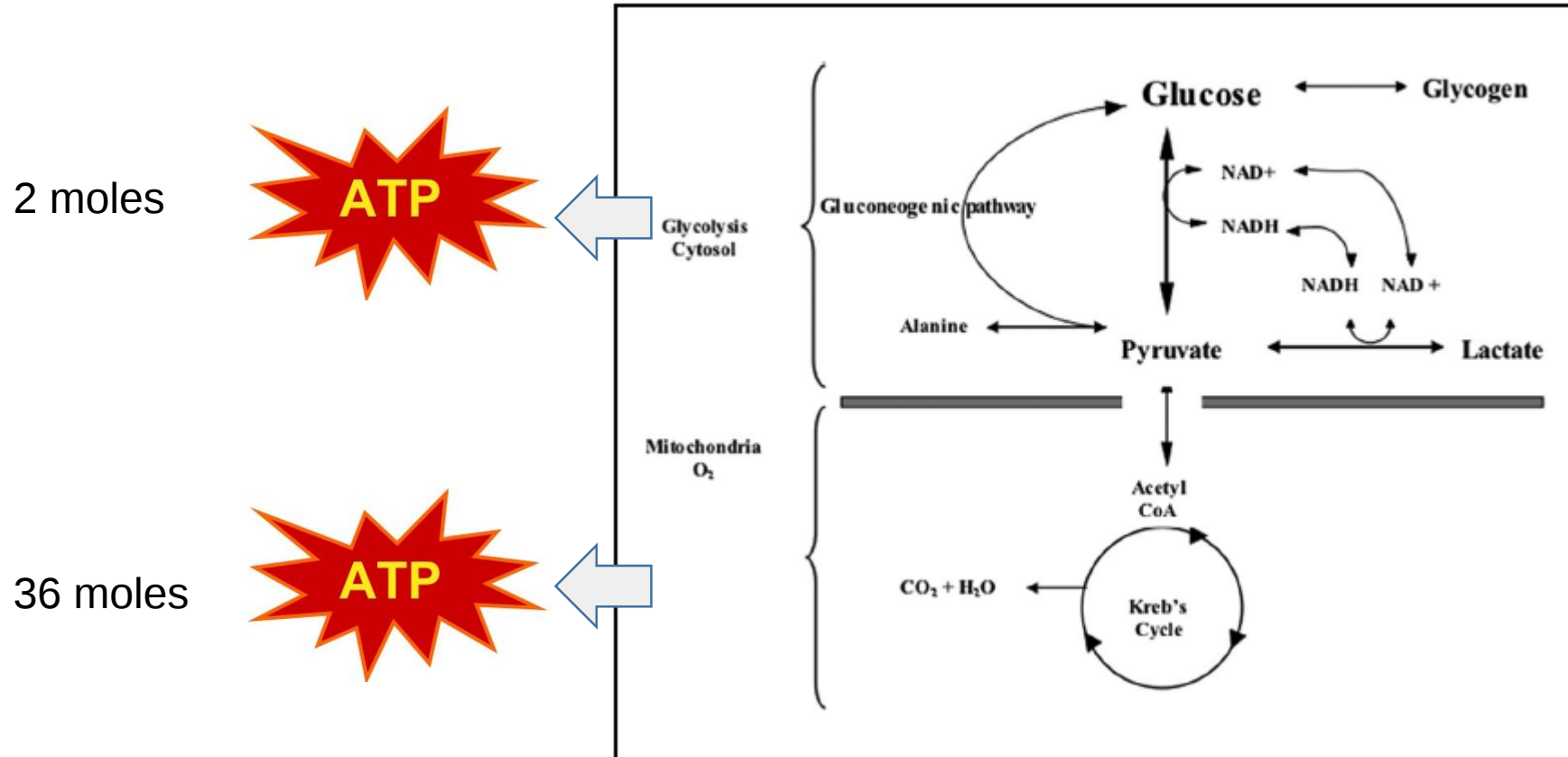
Figure 1—Kaplan-Meier survival curves for critically ill hypotensive (SBP ≤ 90 mm Hg) dogs with (n = 38; dotted line) and without (29; solid line) hyperlactatemia (lactate concentration ≥ 2.0 mmol/L [18 mg/dL]). The steps on each curve indicate the death of 1 or more dogs, and triangles indicate dogs that were censored (dogs that survived to hospital discharge).

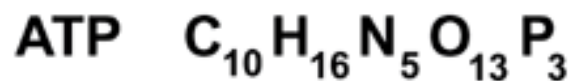
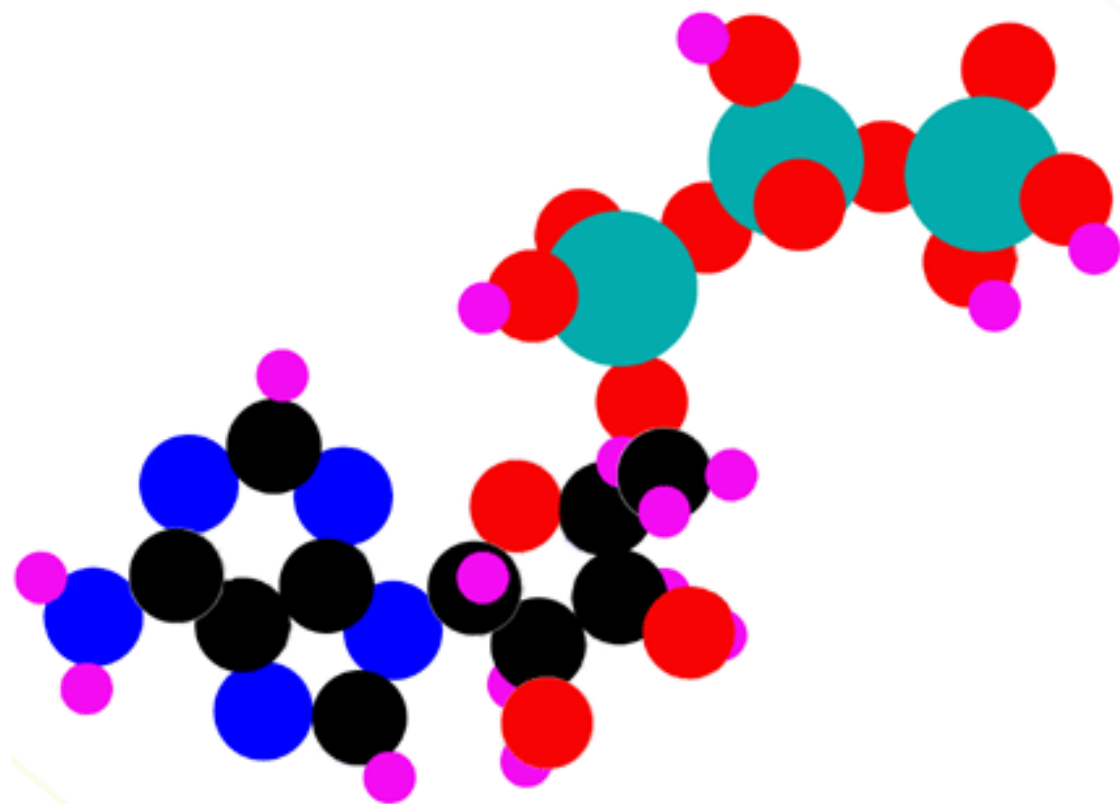
Lactate in Veterinary Critical Care: Pathophysiology and Management

Daniel S. Pang, BVSc, MSc,
Diplomate ECVA

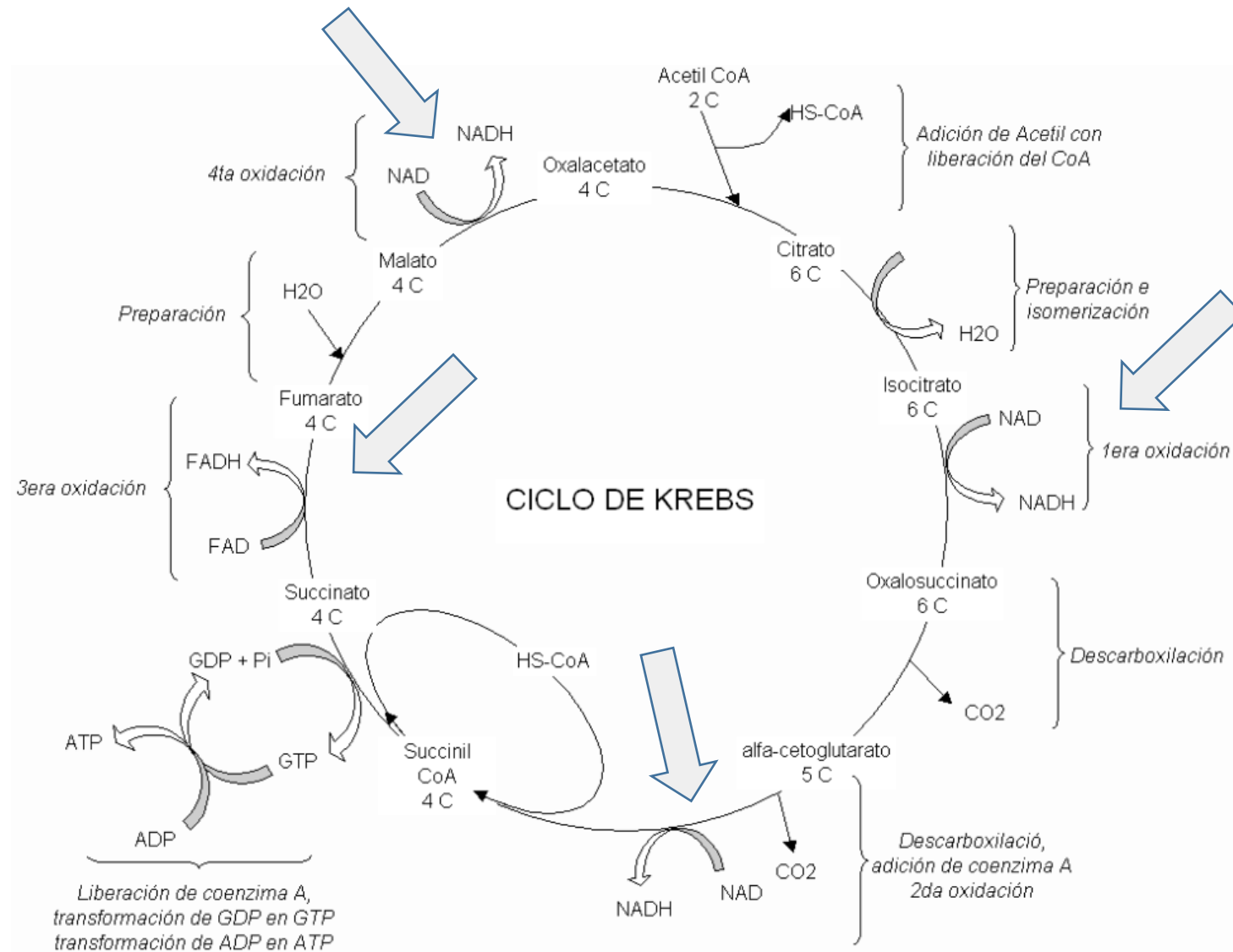
Søren Boysen, DVM,
Diplomate ACVECC

JOURNAL of the American Animal Hospital Association





Origen de la acidosis



Update: Clinical Use of Plasma Lactate

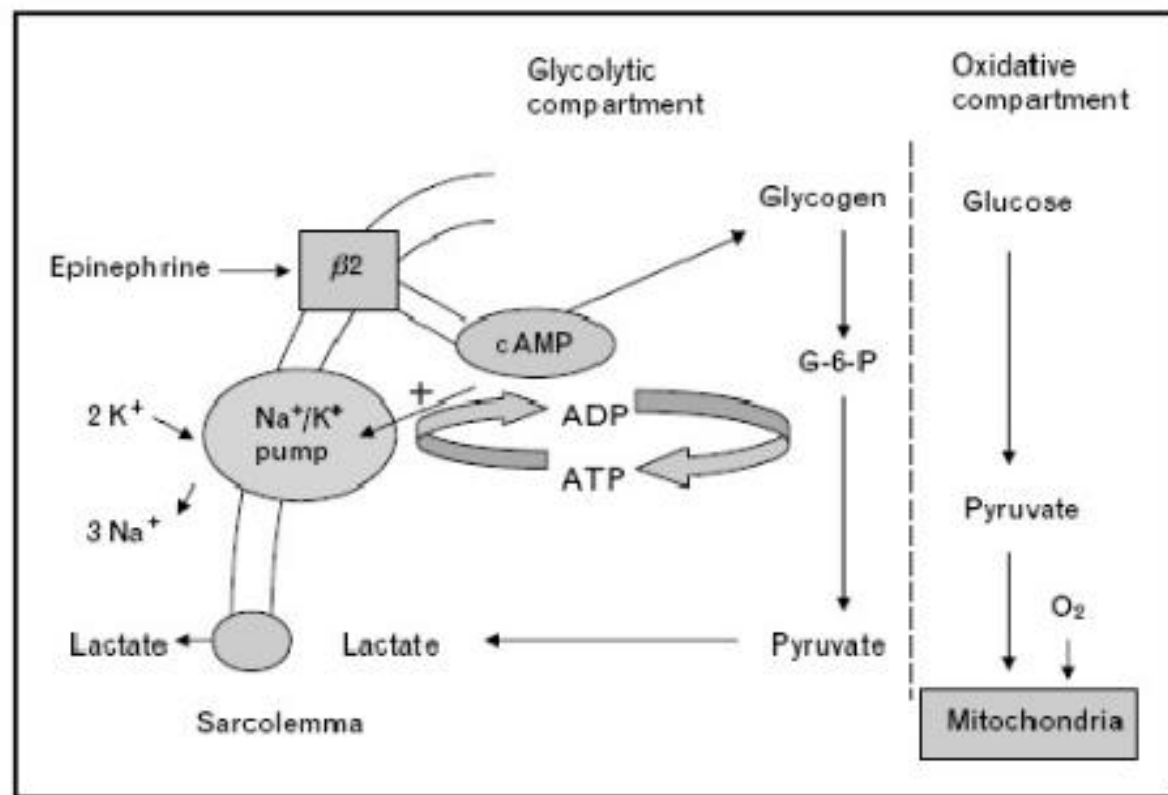
Ide Gillespie, BVMS, Patricia G. Rosenstein, DVM, Dez Hughes, BVSc*

Table 1 Causes of hyperlactatemia				
Type A: Clinical Evidence of Relative or Absolute Tissue Oxygen Deficiency		Type B: No Clinical Evidence of Tissue Oxygen Deficiency		
Decreased oxygen delivery:	Increased oxygen demand:	Type B1: associated with underlying disease	Type B2: associated drugs or toxins	Type B3: associated with inborn errors in metabolism
systemic hypoperfusion ^a Shock ^a • Hypovolemic • Obstructive • Cardiogenic • Distributive Local hypoperfusion • Gastric necrosis • Intestinal ischemia • Aortic thromboembolism Other causes of tissue hypoxia • Severe euvoletic anemia (PCV <15%) • Severe hypoxemia (P_aO₂ <25–40 mm Hg) • Carbon monoxide toxicity	• Seizure activity • Tremors • Struggling • Shivering/trembling • Exercise	• Sepsis/SIRS • Diabetes mellitus • Neoplasia • Thiamine deficiency • Severe liver disease • Pheochromocytoma	• Acetaminophen • Activated charcoal • β2 agonists • Bicarbonate • Catecholamines • Corticosteroids^a • Cyanide • Ethanol • Ethylene glycol • Glucose • Halothane • Insulin • Lactulose • Methanol • Morphine • Nitroprusside • Salicylates • Strychnine • Terbutaline • TPN • Xylitol	• Enzymatic deficiencies • Mitochondrial myopathies • MELAS Miscellaneous: • Alkalosis/hyperventilation • Hypoglycemia • Increased D-lactate level

Lactic Acidosis in Sepsis: It's Not All Anaerobic

Implications for Diagnosis and Management

Bandarn Suetrong, MD; and Keith R. Walley, MD



RESEARCH

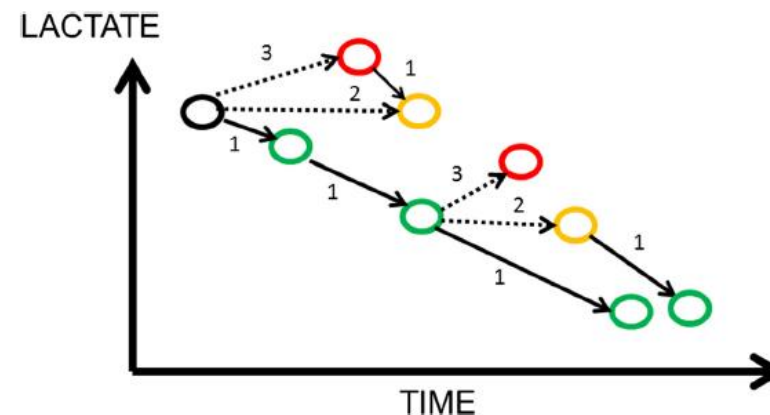
Open Access

The value of blood lactate kinetics in critically ill patients: a systematic review



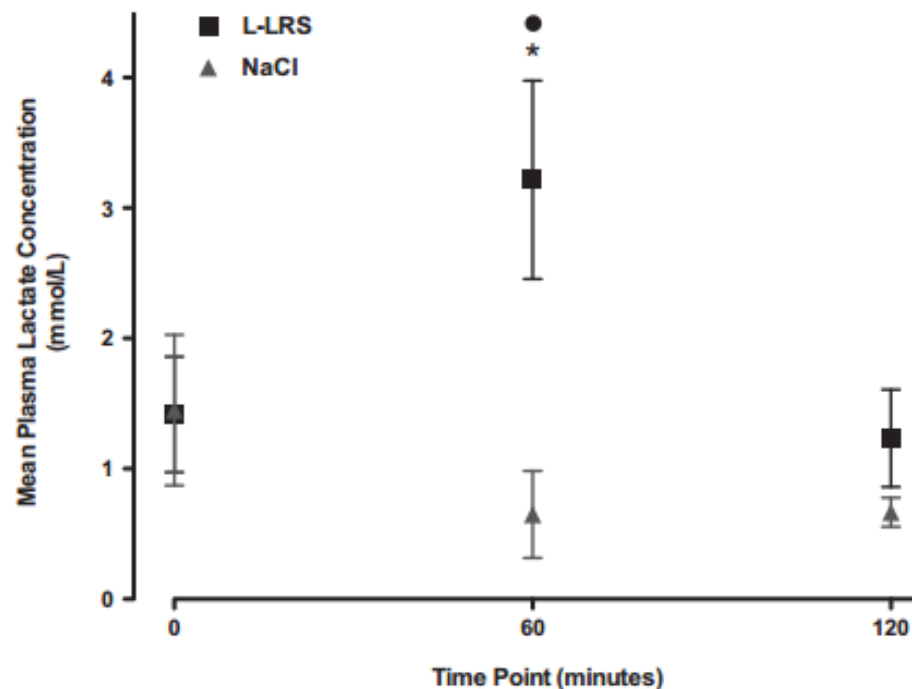
Jean-Louis Vincent^{*}, Amanda Quintairos e Silva[†], Lúcio Couto Jr[†] and Fabio S. Taccone

- El cambio de los niveles séricos de lactato se produce por el metabolismo **y por las disminución de la síntesis!!!**
- El término clearance es incorrecto además porque supone una progresiva normalización. El lactato suele tener una compleja evolución



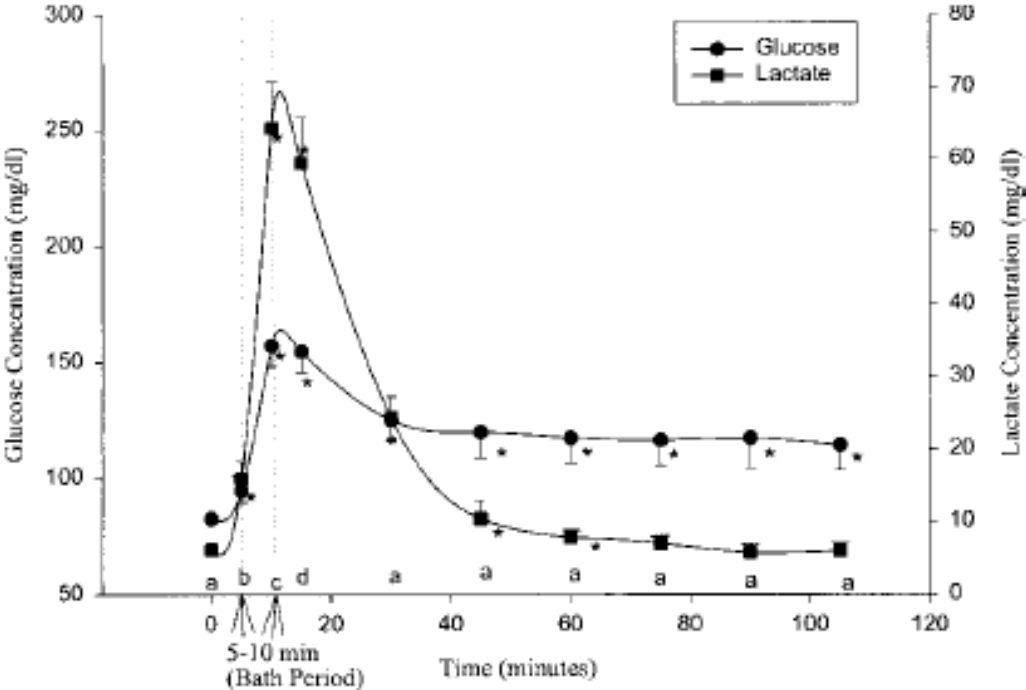
Effects of rapid intravenous 100% L-isomer lactated Ringer's administration on plasma lactate concentrations in healthy dogs

Søren R. Boysen, DVM, DACVECC and Patricia Dorval, DVM, DACVECC



Acute Stress Hyperglycemia in Cats Is Associated with Struggling and Increased Concentrations of Lactate and Norepinephrine

Jacqueline S. Rand, Emily Kinnaird, Anthony Baglioni, Judith Blackshaw, and Jan Priest

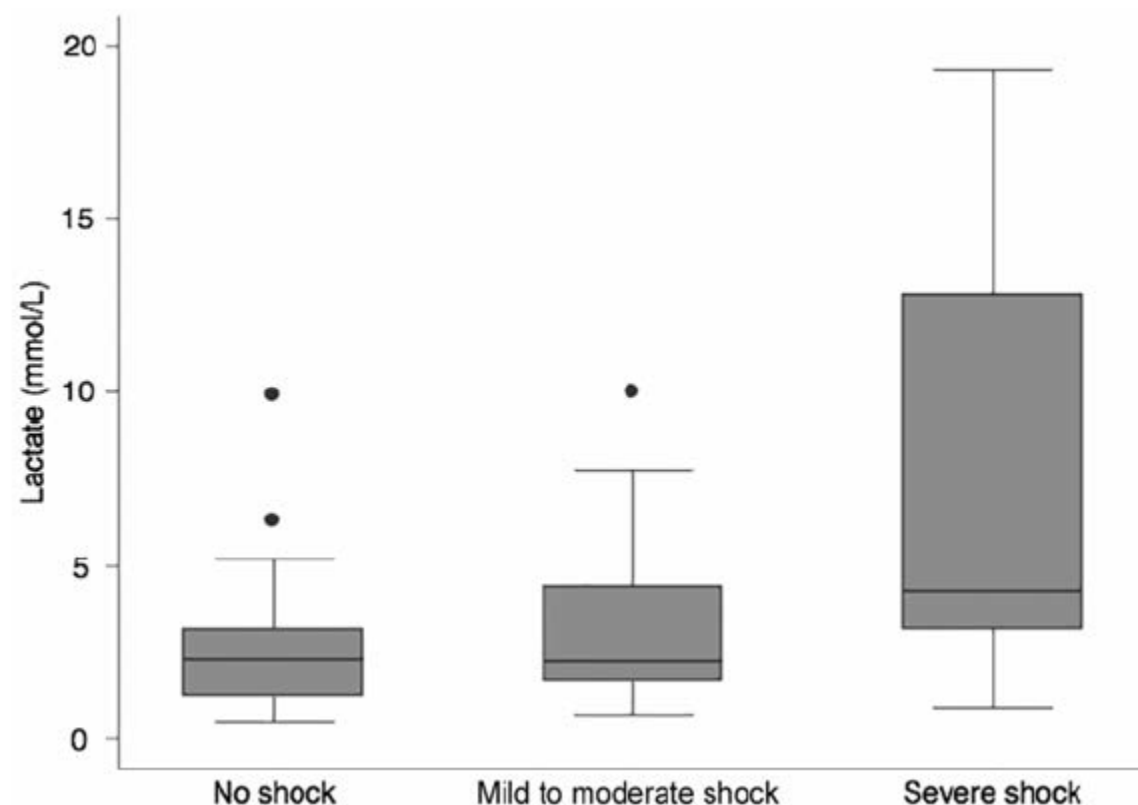


Behavior	Definition
Struggling	Any vigorous body movements requiring restraint
Vocalization	Any noise made by the cat, with the exception of hissing, including meowing, moaning, screaming, and howling
Aggression	Behavior directed against the handler, including hissing, clawing, or biting
Immobility response	Crouched position with no attempts to move
Hypersalivation	Increased salivation resulting in dripping of saliva from the cat's mouth
Mouth breathing	Open-mouthed position without vocalization

Association of blood lactate concentration with physical perfusion variables, blood pressure, and outcome for cats treated at an emergency service

Erica L. Reineke, VMD; Colleen Rees; Kenneth J. Drobatz, DVM, MSCE

JAVMA, Vol 247, No. 1, July 1, 2015



Update: Clinical Use of Plasma Lactate

Ide Gillespie, BVMS, Patricia G. Rosenstein, DVM, Dez Hughes, BVSc*

Table 1
Causes of hyperlactatemia

Type A: Clinical Evidence of Relative or Absolute Tissue Oxygen Deficiency		Type B: No Clinical Evidence of Tissue Oxygen Deficiency		
Decreased oxygen delivery:	Increased oxygen demand:	Type B1: associated with underlying disease	Type B2: associated drugs or toxins	Type B3: associated with inborn errors in metabolism
- systemic hypoperfusion^a - Shock^a - Hypovolemic - Obstructive - Cardiogenic - Distributive - Local hypoperfusion - Gastric necrosis - Intestinal ischemia - Aortic thromboembolism - Other causes of tissue hypoxia - Severe euvolemic anemia (PCV <15%) - Severe hypoxemia (P_aO₂ <25–40 mm Hg) - Carbon monoxide toxicity	- Seizure activity - Tremors - Struggling - Shivering/trembling - Exercise	- Sepsis/SIRS - Diabetes mellitus - Neoplasia - Thiamine deficiency - Severe liver disease - Pheochromocytoma	- Acetaminophen - Activated charcoal - β2 agonists - Bicarbonate - Catecholamines - Corticosteroids^a - Cyanide - Ethanol - Ethylene glycol - Glucose - Halothane - Insulin - Lactulose - Methanol - Morphine - Nitroprusside - Salicylates - Strychnine - Terbutaline - TPN - Xylitol	- Enzymatic deficiencies - Mitochondrial myopathies - MELAS Miscellaneous: - Alkalosis/hyperventilation - Hypoglycemia - Increased D-lactate level

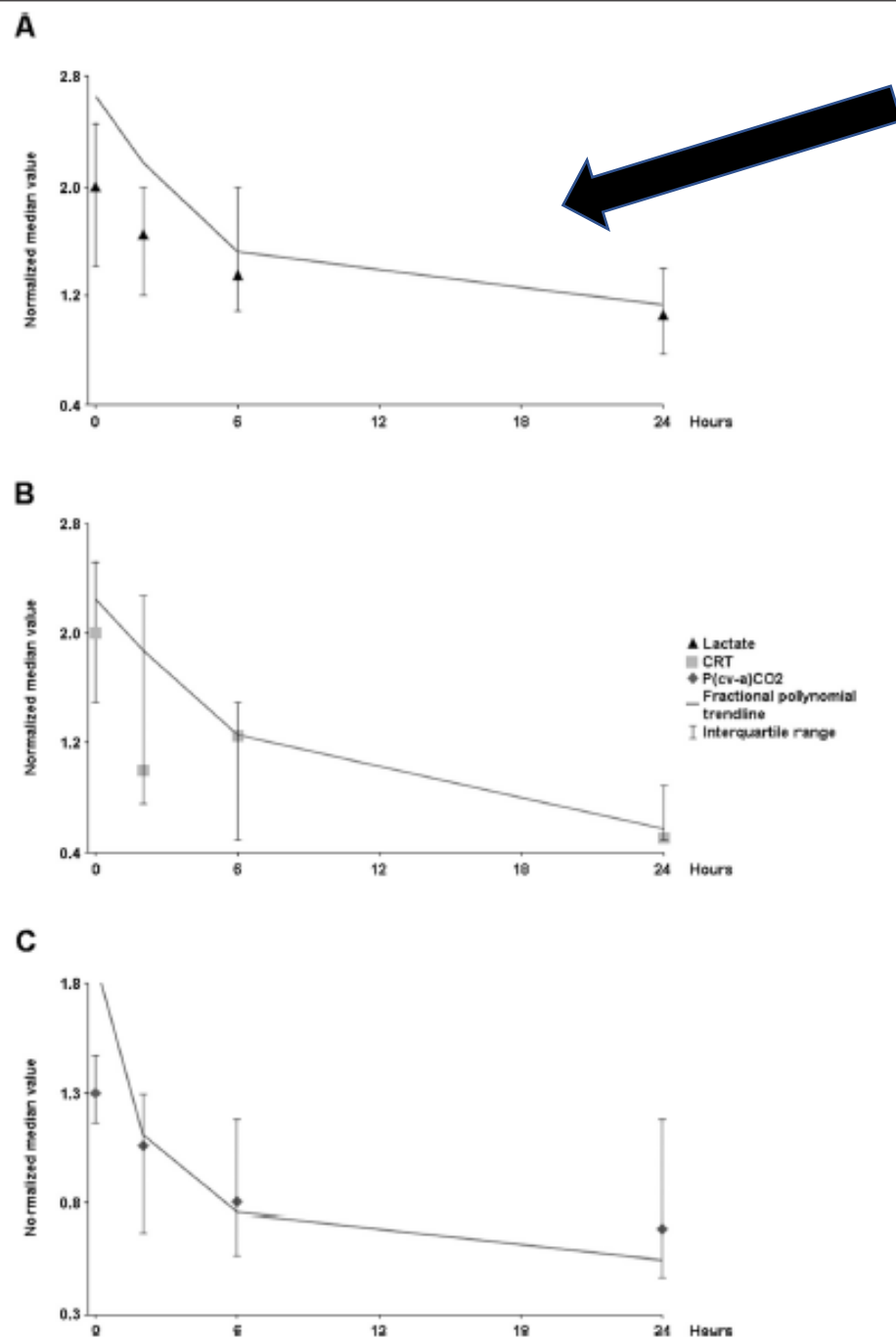


Figure 1 Time-trend changes for selected perfusion parameters after normalization showing a biphasic recovery trend (see statistical analysis): **A**, lactate; **B**, capillary refill time (CRT); **C**, central venous-arterial $p\text{CO}_2$ gradient ($P(\text{cv-a})\text{CO}_2$).

When to stop septic shock resuscitation: clues from a dynamic perfusion monitoring

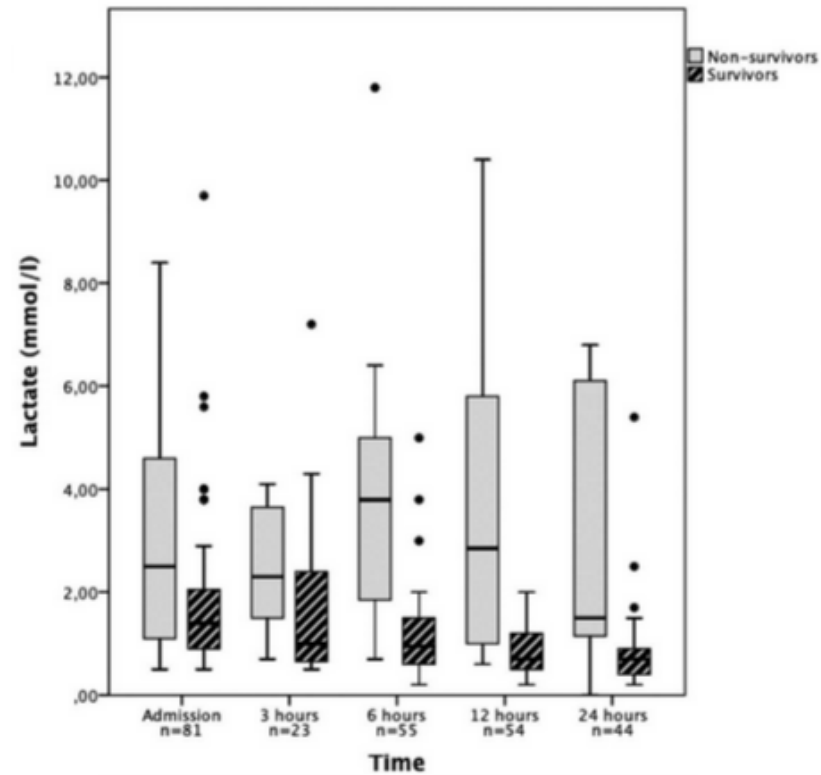
Glenn Hernandez^{1*}, Cecilia Luengo², Alejandro Bruhn¹, Eduardo Kattan¹, Gilberto Friedman³, Gustavo A Ospina-Tascon⁴, Andrea Fuentealba¹, Ricardo Castro¹, Tomas Regueira¹, Carlos Romero², Can Ince⁵ and Jan Bakker⁵

Annals of Intensive Care
a SpringerOpen Journal

Results: Some variables such as central venous oxygen saturation, central venous-arterial $p\text{CO}_2$ gradient, and capillary refill time were already normal in more than 70% of survivors at 6 h. Lactate presented a much slower normalization rate decreasing significantly at 6 h compared to that of baseline (4.0 [3.0 to 4.9] vs. 2.7 [2.2 to 3.9])

Plasma lactate concentrations in septic peritonitis: A retrospective study of 83 dogs (2007–2012)

Stefano Cortellini, DVM, MRCVS; Mayank Seth, BSc, BVetMed, DACVIM, MRCVS and Lindsay M. Kellett-Gregory, BSc, BVetMed, DACVECC, MRCVS

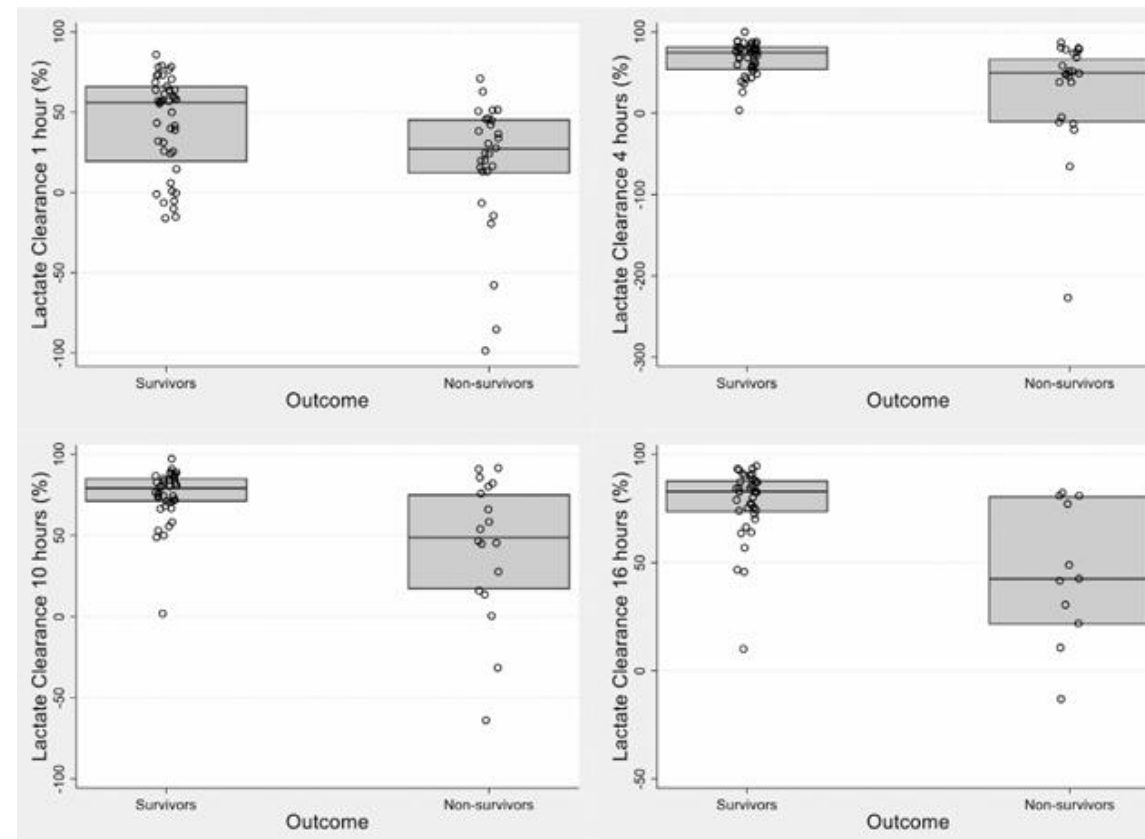


Bajar lactatemia un 21% en primeras 6 hs
Bajar lactatemia un 42% en las primeras 12 hs

ORIGINAL STUDY

Prospective evaluation of plasma lactate parameters for prognosticating dogs with shock

Alex Louis Blutinger VMD  | Ann Marie Zollo DVM, DACVECC | Joel Weltman DVM, DACVECC, PhD  | Jennifer Prittie DVM, DACVIM, DACVECC 



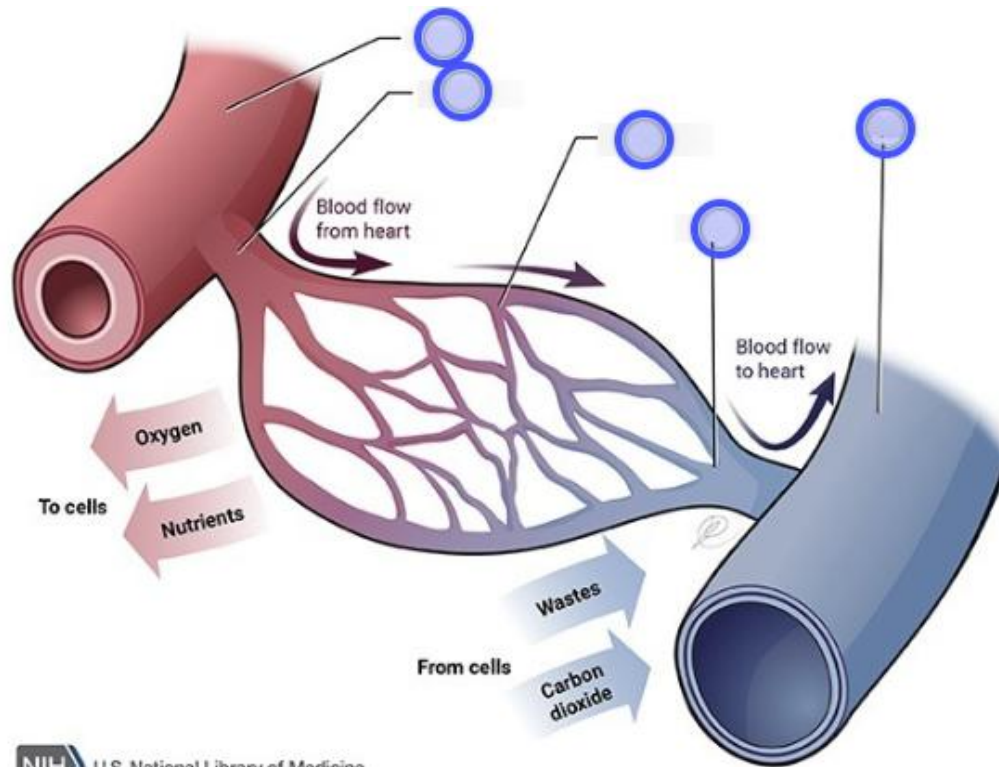
Paciente con shock séptico: SvO₂: 80%,
Lactato 5 mmol/L



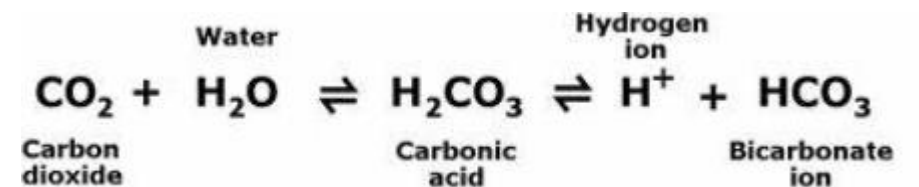
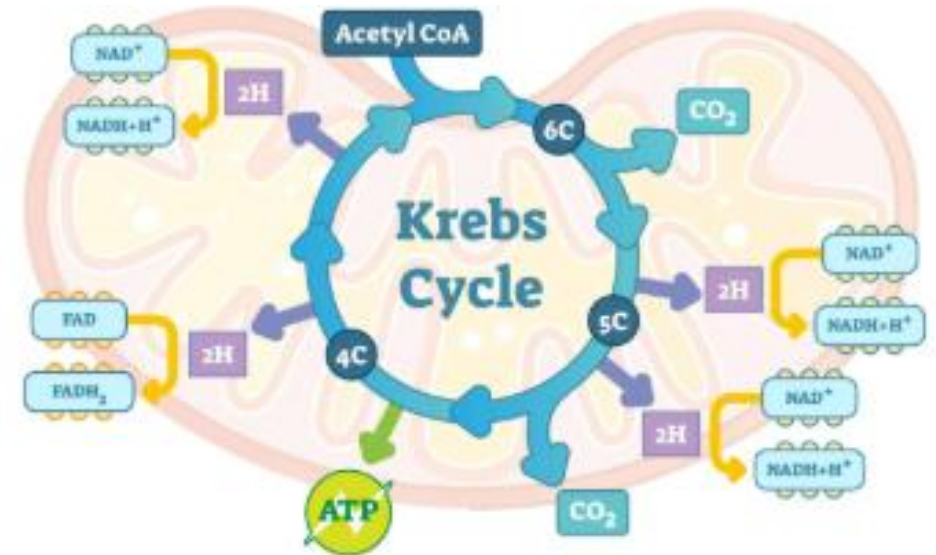
Interpretación:

- A-SvO₂ alta sugiere que el paciente no tiene hipoxia tisular. Lactato alto posiblemente sea tipo B
- B- La SvO₂ alta se da por un problema en la extracción de O₂, Lactato alto dice que el paciente tiene hipoxia tisular
- C-Ambas opciones pueden ser posibles. Necesito otras herramientas de monitoreo

Delta CO₂: aumenta en presencia de isquemia

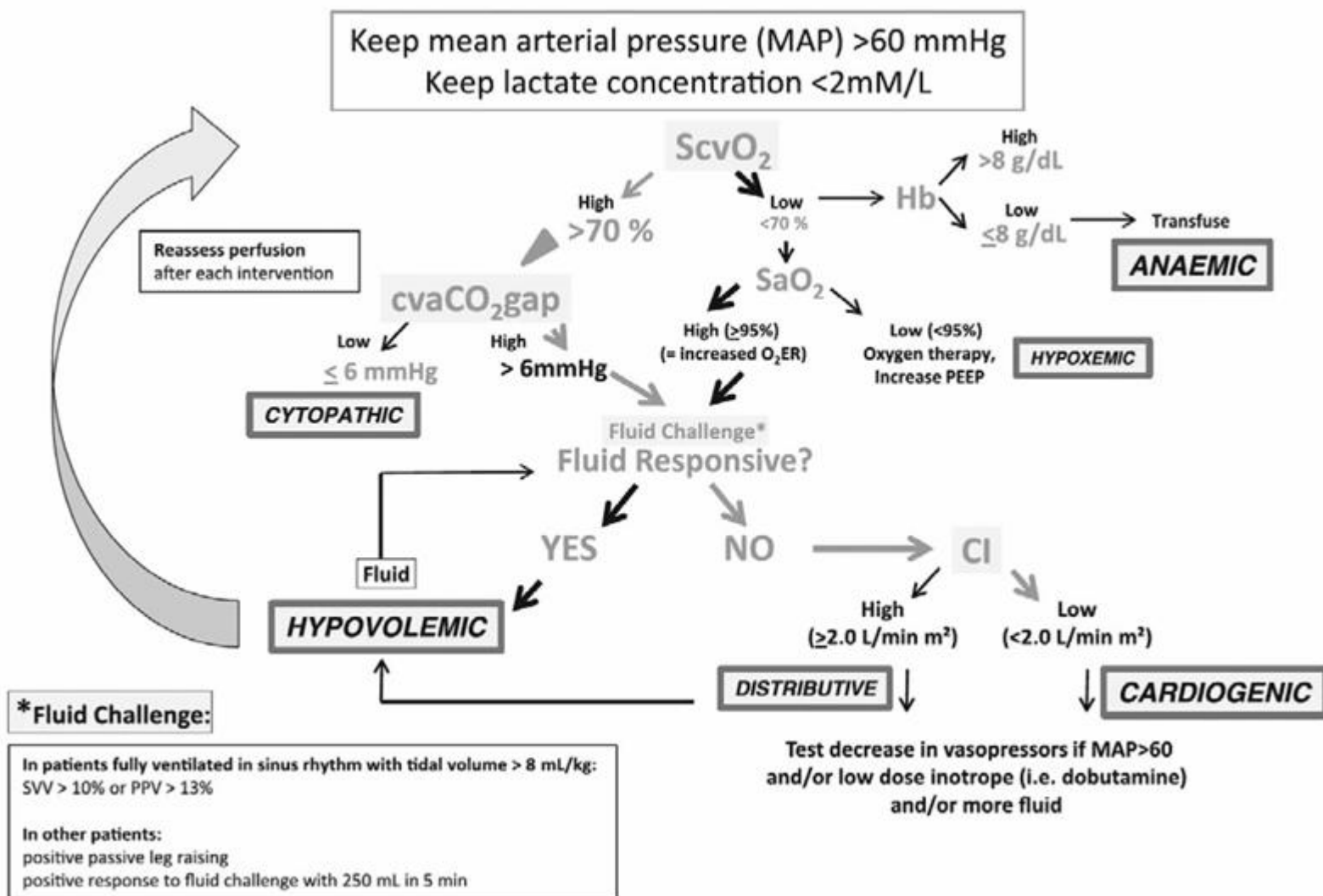


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Understanding the carbon dioxide gaps

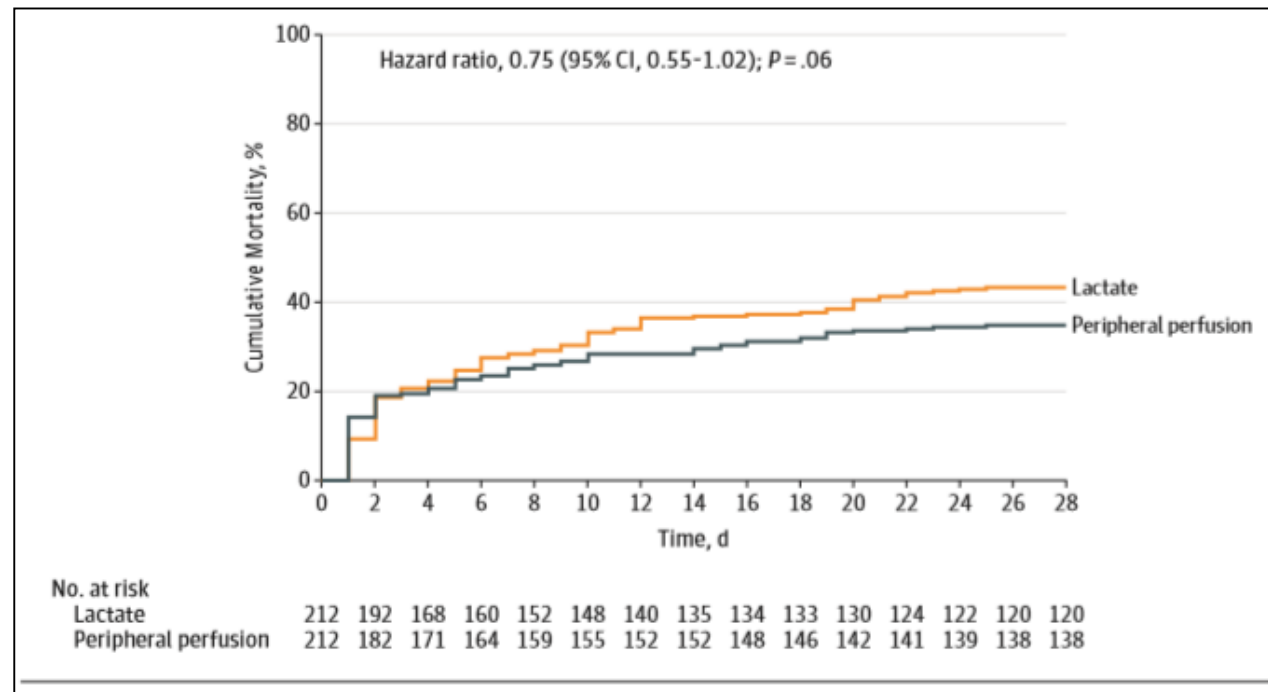
Thomas W.L. Scheeren^a, Jannis N. Wicke^a, and Jean-Louis Teboul^{b,c}



Effect of a Resuscitation Strategy Targeting Peripheral Perfusion Status vs Serum Lactate Levels on 28-Day Mortality Among Patients With Septic Shock

The ANDROMEDA-SHOCK Randomized Clinical Trial

Glenn Hernández, MD, PhD; Gustavo A. Ospina-Tascón, MD, PhD; Lucas Petri Damiani, MSc; Elisa Estenssoro, MD; Arnaldo Dubin, MD, PhD; Javier Hurtado, MD; Gilberto Friedman, MD, PhD; Ricardo Castro, MD, MPH; Leyla Alegría, RN, MSc; Jean-Louis Teboul, MD, PhD; Maurizio Cecconi, MD, FFICM; Giorgio Ferri, MD; Manuel Jibaja, MD; Ronald Pairumani, MD; Paula Fernández, MD; Diego Barahona, MD; Vladimir Granda-Luna, MD, PhD; Alexandre Biasi Cavalcanti, MD, PhD; Jan Bakker, MD, PhD; for the ANDROMEDA-SHOCK Investigators and the Latin America Intensive Care Network (LIVEN)



ORIGINAL STUDY



Standardized capillary refill time and relation to clinical parameters in hospitalized dogs

Nolan V. Chalifoux DVM | Carl F. Spielvogel VMD | Darko Stefanovski PhD, MS |
Deborah C. Silverstein DVM, DACVECC

Interventions: The CRT was defined as the duration required for the oral mucosa of the upper lip to return to its original color after blanching for 4 seconds. The CRT was

Linear regression	Coefficient	95% CI	R ²	n	P-value
Rectal temperature (°C)	-0.32	-0.53 to 0.10	0.083	97	0.004
Systolic blood pressure	-8.53	-16.09 to 0.97	0.061	80	0.028
Body weight	-3.56	-6.78 to 0.33	0.042	110	0.031
Ordinal logistic regression	OR	95% CI	Pseudo-R ²	n	P-value
Mucous membrane color	0.54	0.35-0.85	0.040	110	0.007
Skin turgor	1.77	1.03-3.04	0.046	101	0.039
APPLE mentation score	1.68	1.09-2.61	0.031	108	0.019

Intraobserver and interobserver reliability of standardized capillary refill time in dogs is high following observer training

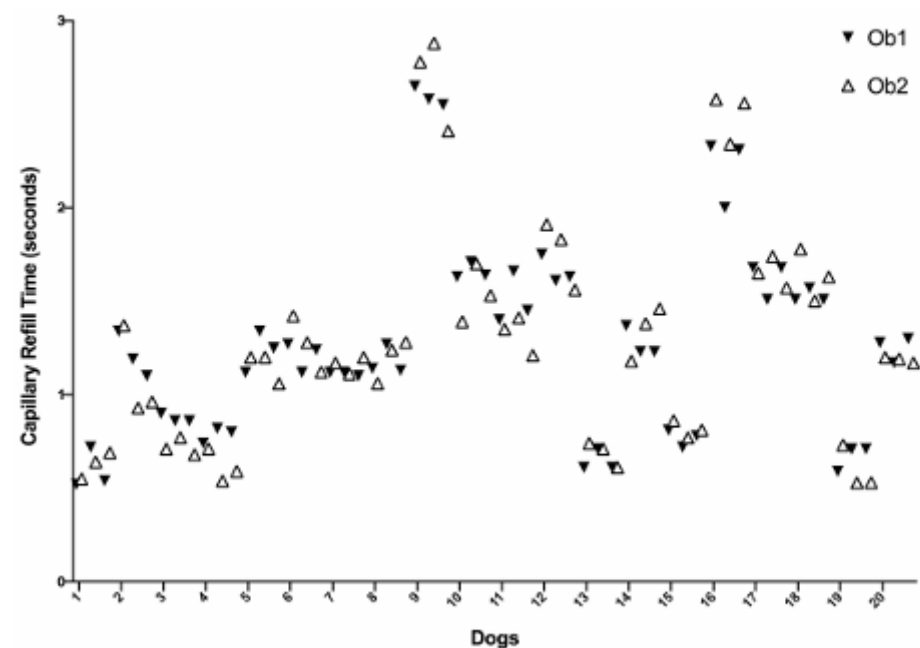
Aina Claret, DVM; Stefania Gelendi, DVM; Kendon Kuo, DVM, MS, DACVECC; Maureen McMichael, DVM, M Ed, DACVECC; Katherine Gerken, DVM, MS, DACVECC; Pen-Ting Liao, DVM, MVM, DVSc, DACVAA, DACVECC*

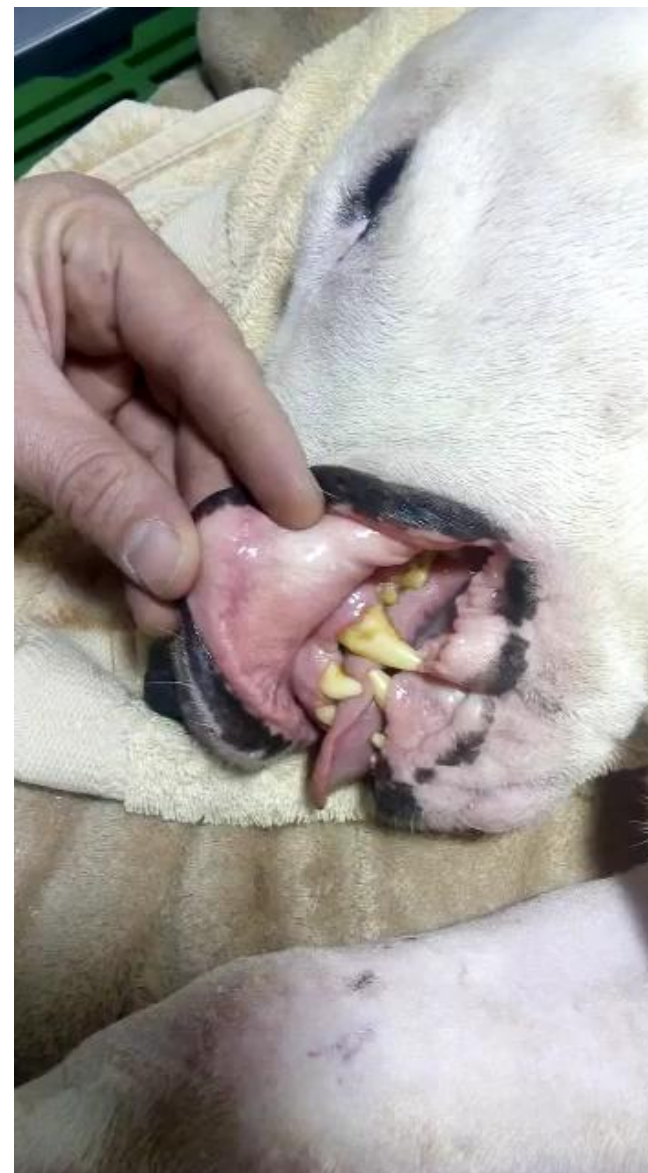
Department of Clinical Sciences, College of Veterinary Medicine, Auburn University, Auburn, AL

*Corresponding author: Dr. Liao (pzl0052@auburn.edu)

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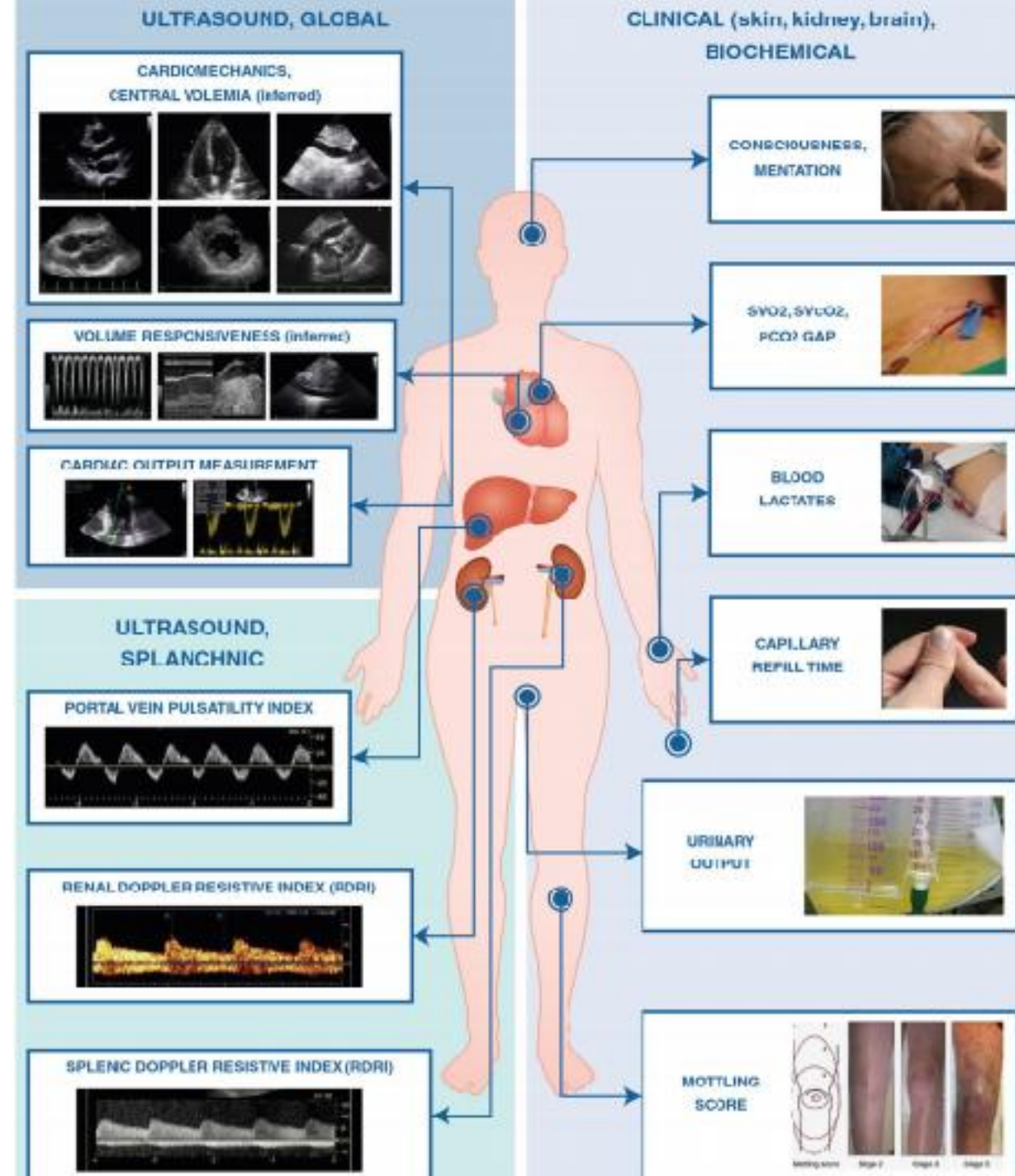


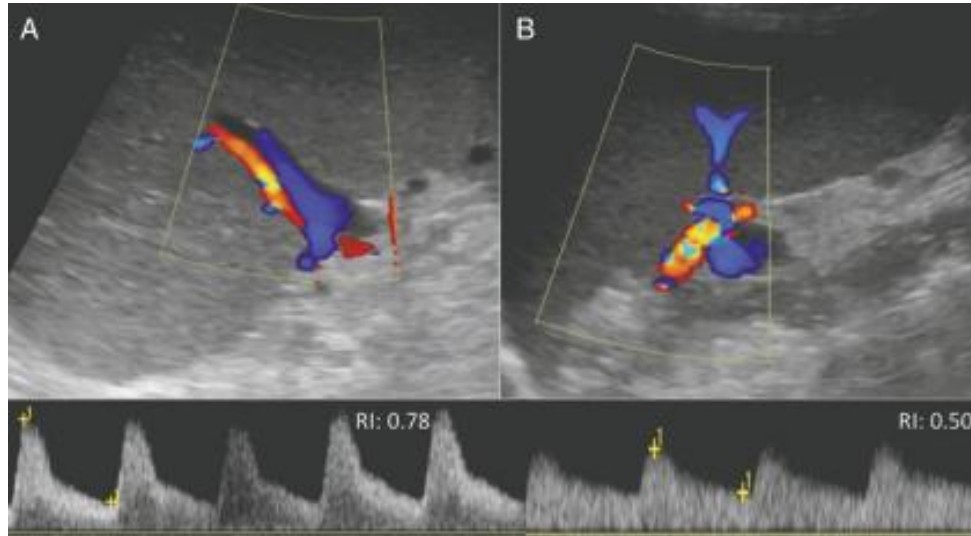


WHAT'S NEW IN INTENSIVE CARE

What's new in ultrasound-based assessment of organ perfusion in the critically ill: expanding the bedside clinical monitoring window for hypoperfusion in shock

Francesco Corradi^{1,2*}, Gabriele Via³ and Guido Tavazzi^{4,5}

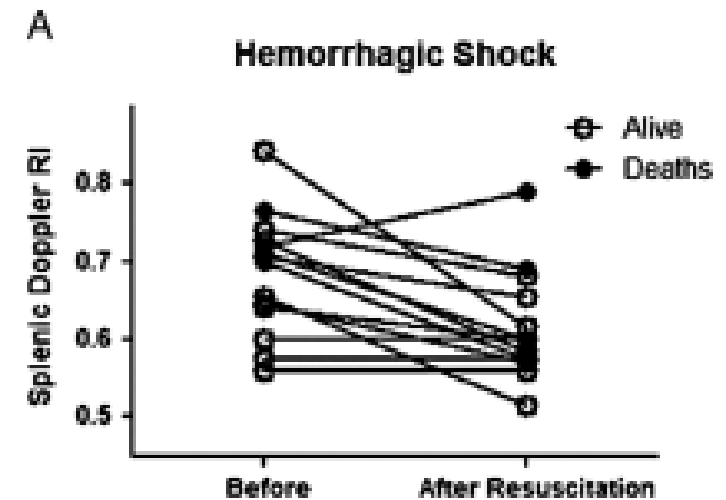




SHOCK, Vol. 38, No. 5, pp. 466–473, 2012

SPLenic DOPPLER RESISTIVE INDEX FOR EARLY DETECTION OF OCCULT HEMORRHAGIC SHOCK AFTER POLYTRAUMA IN ADULT PATIENTS

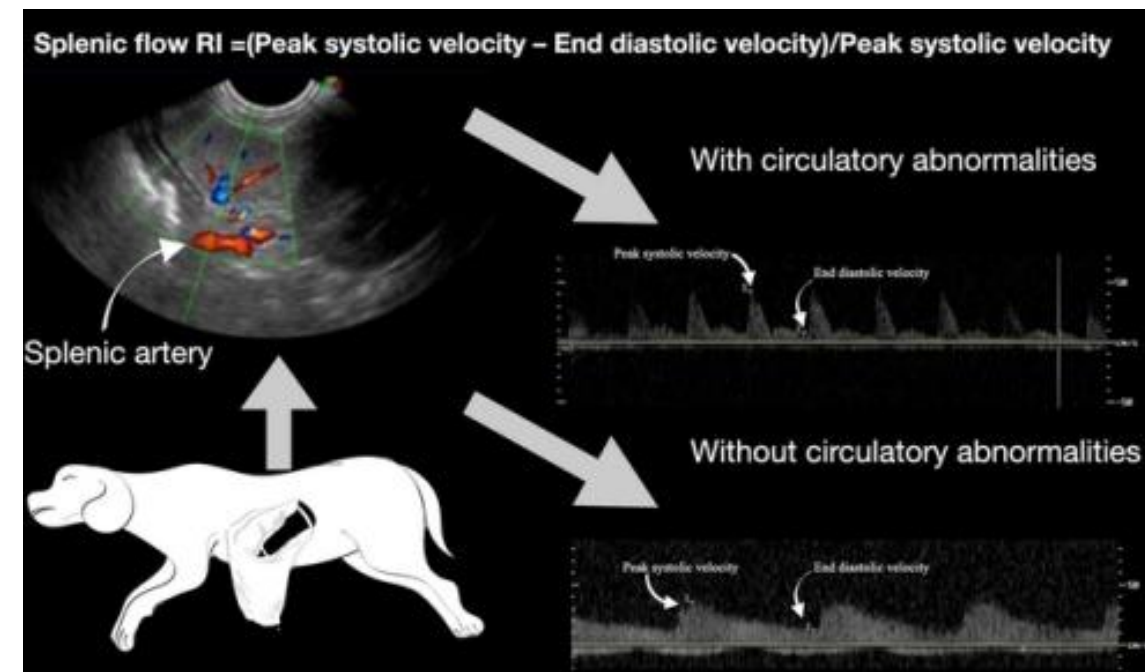
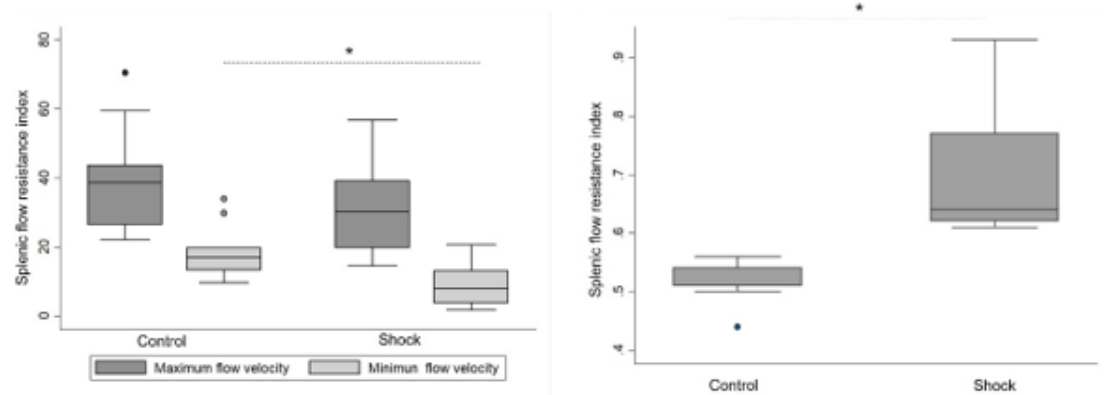
Francesco Corradi,* Claudia Brusasco,[†] Alessandro Garlaschi,[‡] Gregorio Santori,[†]
Antonella Vezzani,[§] Paolo Moscatelli,* and Paolo Pelosi[†]



PROSPECTIVE STUDY

Splenic Doppler Resistance Index for Detection of Circulatory Shock in Dogs

Pablo Alejandro Donati^{1,2}  | Pablo E. Otero³ | Lisa Tarragona¹  | Marcela Tunesi² | Manuel Martin Flores³ | Santiago D'alotto² | Arnaldo Dubin⁴



The best cut-off point to differentiate between dogs in shock and dogs without hemodynamic disorders was 0.61, with an AUROC of 1.00 (95% CI 1.00-1.00), sensitivity 100% (95% CI 66.4%-100%), specificity 100% (95% CI 66.4%-100%), positive predictive value 100% (95% CI 66.4%-100%), and a negative predictive value of 100% (95% CI 66.4%-100%).

RESEARCH

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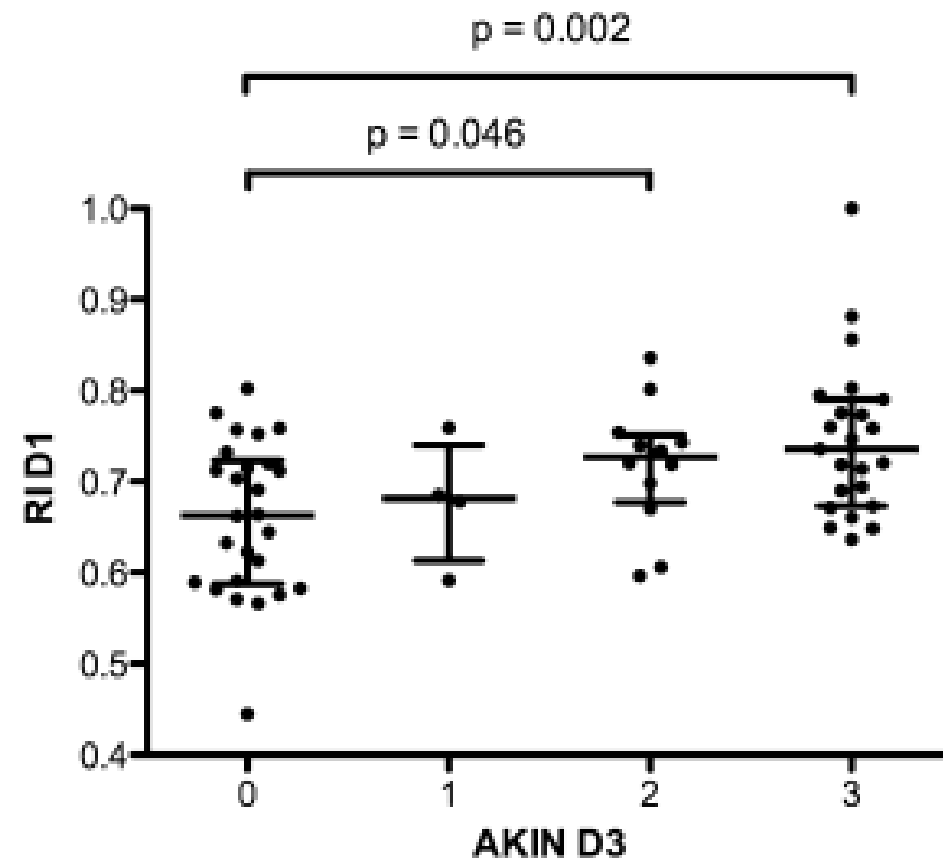


Determinants of Doppler-based renal resistive index in patients with septic shock: impact of hemodynamic parameters, acute kidney injury and predisposing factors

François Beloncle^{1*}, Natacha Rousseau², Jean-François Hamel³, Alexis Donzeau¹, Anne-Lise Foucher¹, Marc-Antoine Custaud⁴, Pierre Asfar¹, René Robert² and Nicolas Lerolle¹

Conclusions

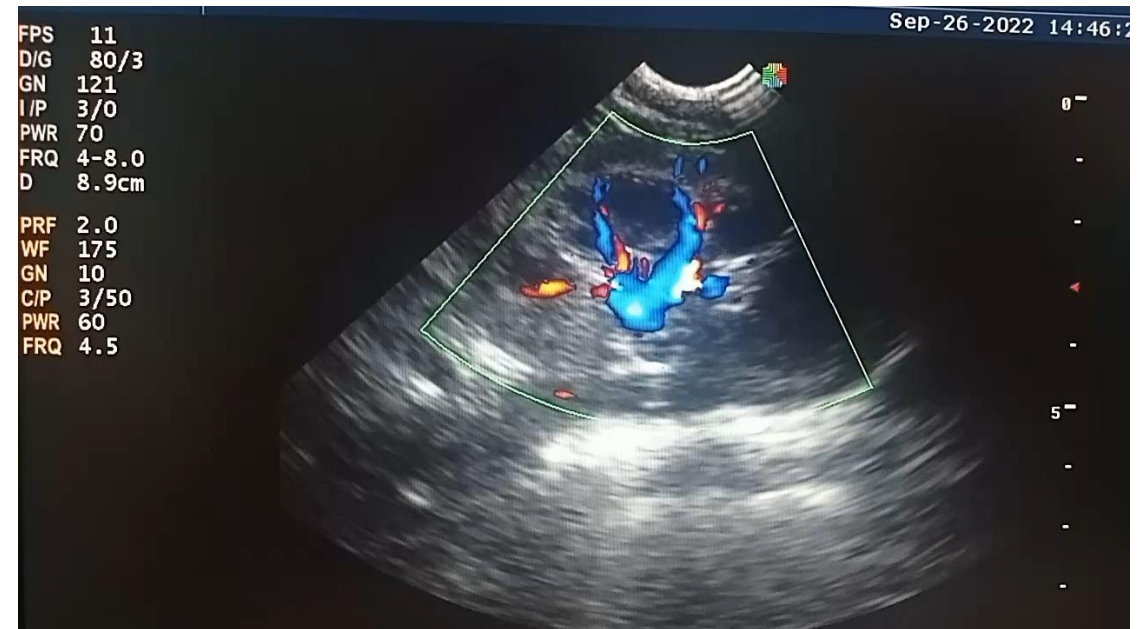
RI was impacted by MAP, presence of severe AKI and severe AKI recovery, PP, day from ICU admission and past medical history of diabetes and/or hypertension.



Modificación del índice de resistencia renal frente a diferentes valores de tensión arterial media en un felino con insuficiencia renal severa.

Tunesi M¹, Donati, P.¹, Guevara J.M¹, Zayas M¹.

1-UCI, Unidad de Cuidados Intensivos Veterinarios, CABA, Argentina. padonati@yahoo.com.ar



Retrospective evaluation of fluid overload and relationship to outcome in critically ill dogs

Amanda A. Cavanagh, DVM, DACVECC; Lauren A. Sullivan, DVM, MS, DACVECC and Bernard D. Hansen, DVM, MS, DACVECC, DACVIM

Conclusions – Critically ill dogs are at increased risk for FO during hospitalization, and a weak but significant association exists between %FO, illness severity, and mortality. Prospective studies are warranted to confirm the findings of this retrospective study.

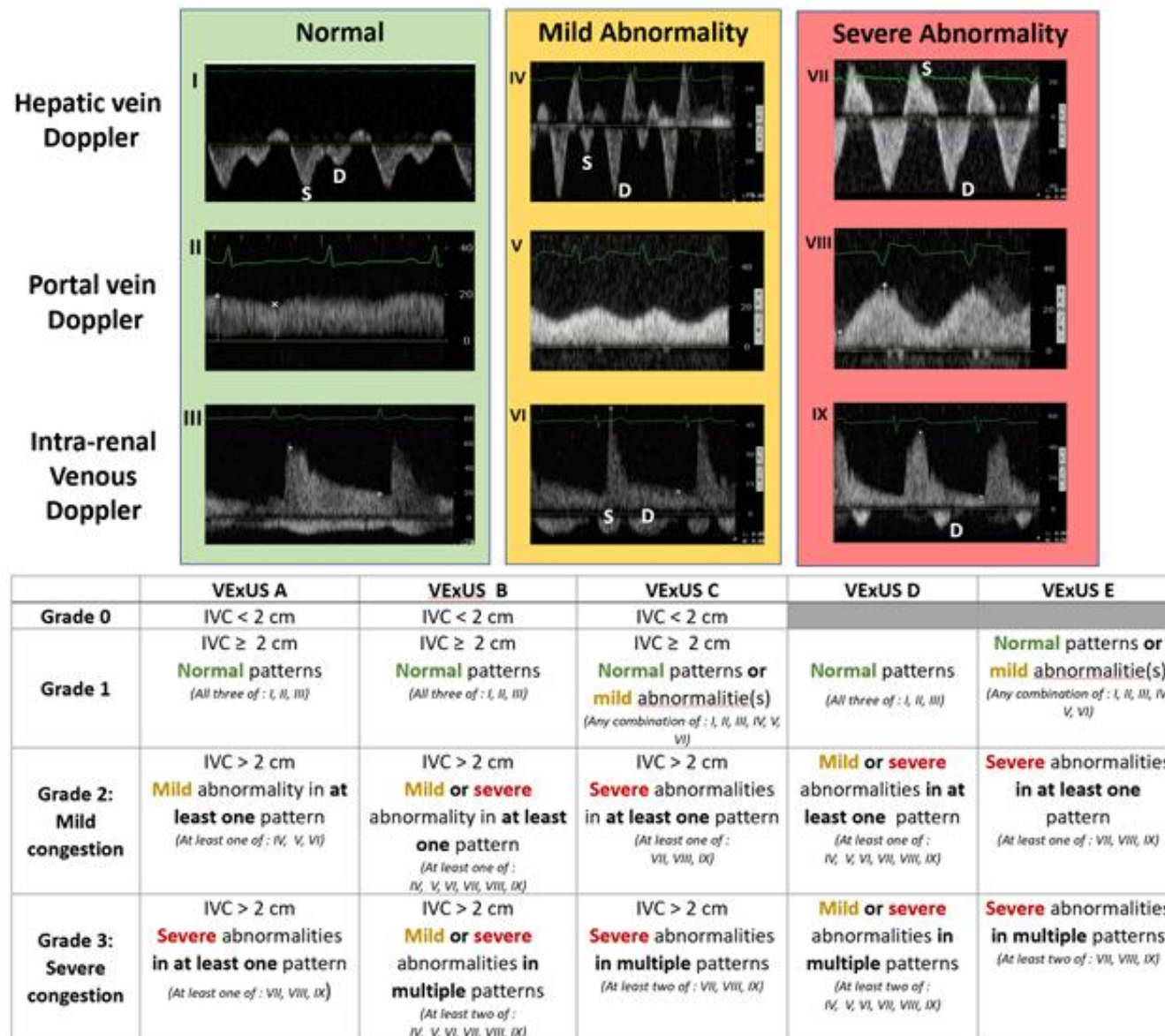
ORIGINAL ARTICLE

Open Access



Quantifying systemic congestion with Point-Of-Care ultrasound: development of the venous excess ultrasound grading system

William Beaubien-Souligny^{1,2*}, Philippe Rola³, Korbin Haycock⁴, Josée Bouchard⁵, Yoan Lamarche⁶, Rory Spiegel⁷ and André Y. Denault^{1,8}



Muchas gracias