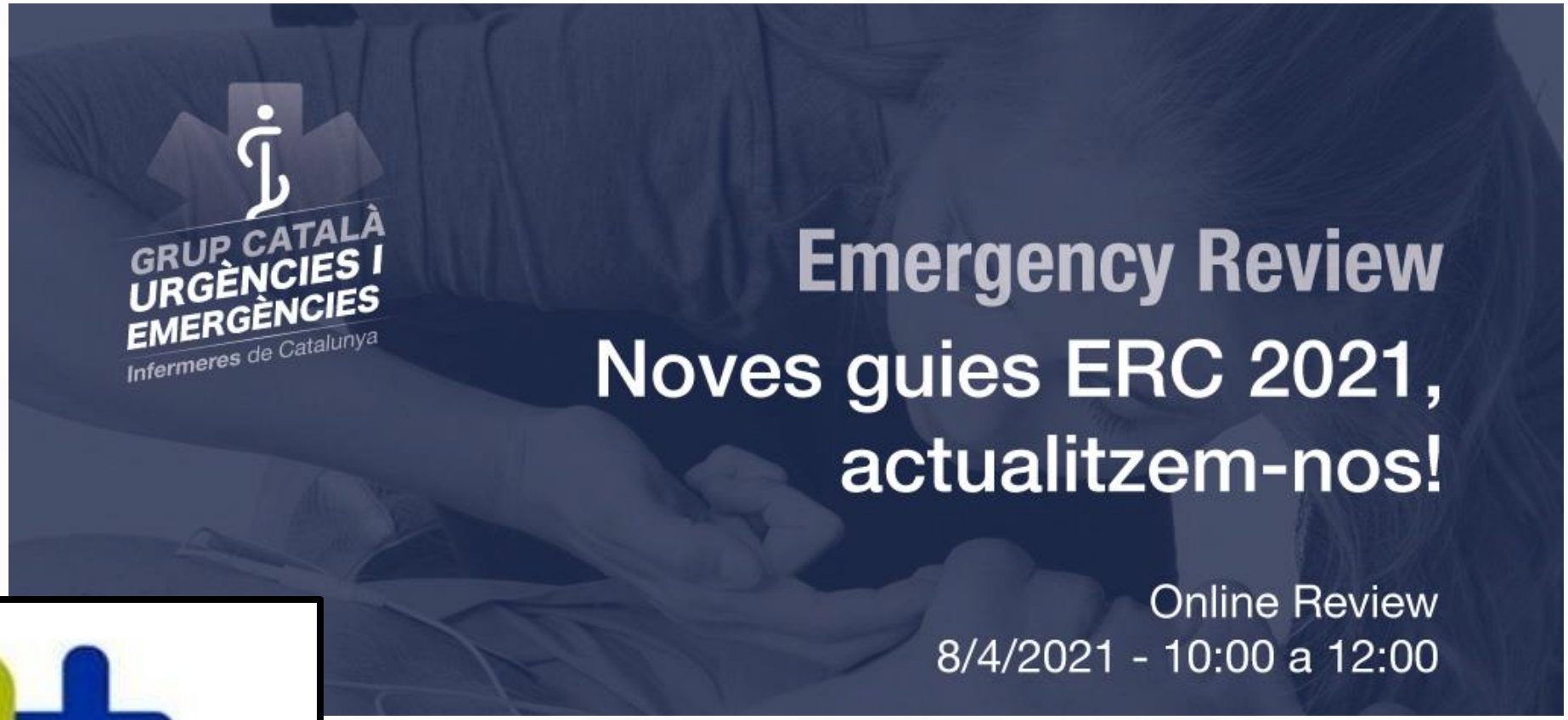


NOVETATS DE LA RCP EN SITUACIONS ESPECIALS

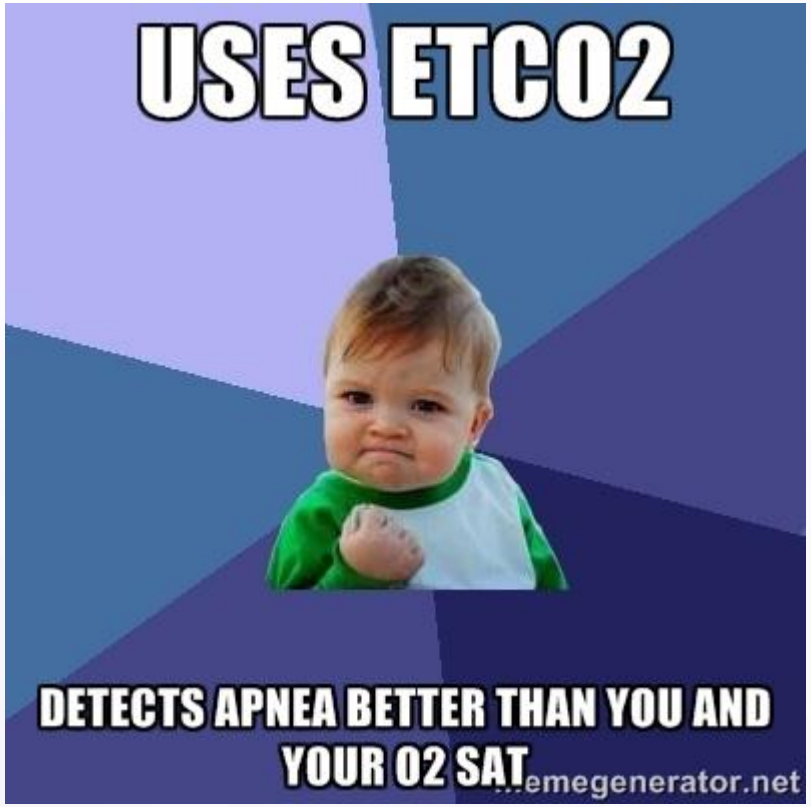
Susana SIMÓ MELÉNDEZ

#EnfermeraInfiltrada

Fig. 9 – Special circumstances infographic summary.

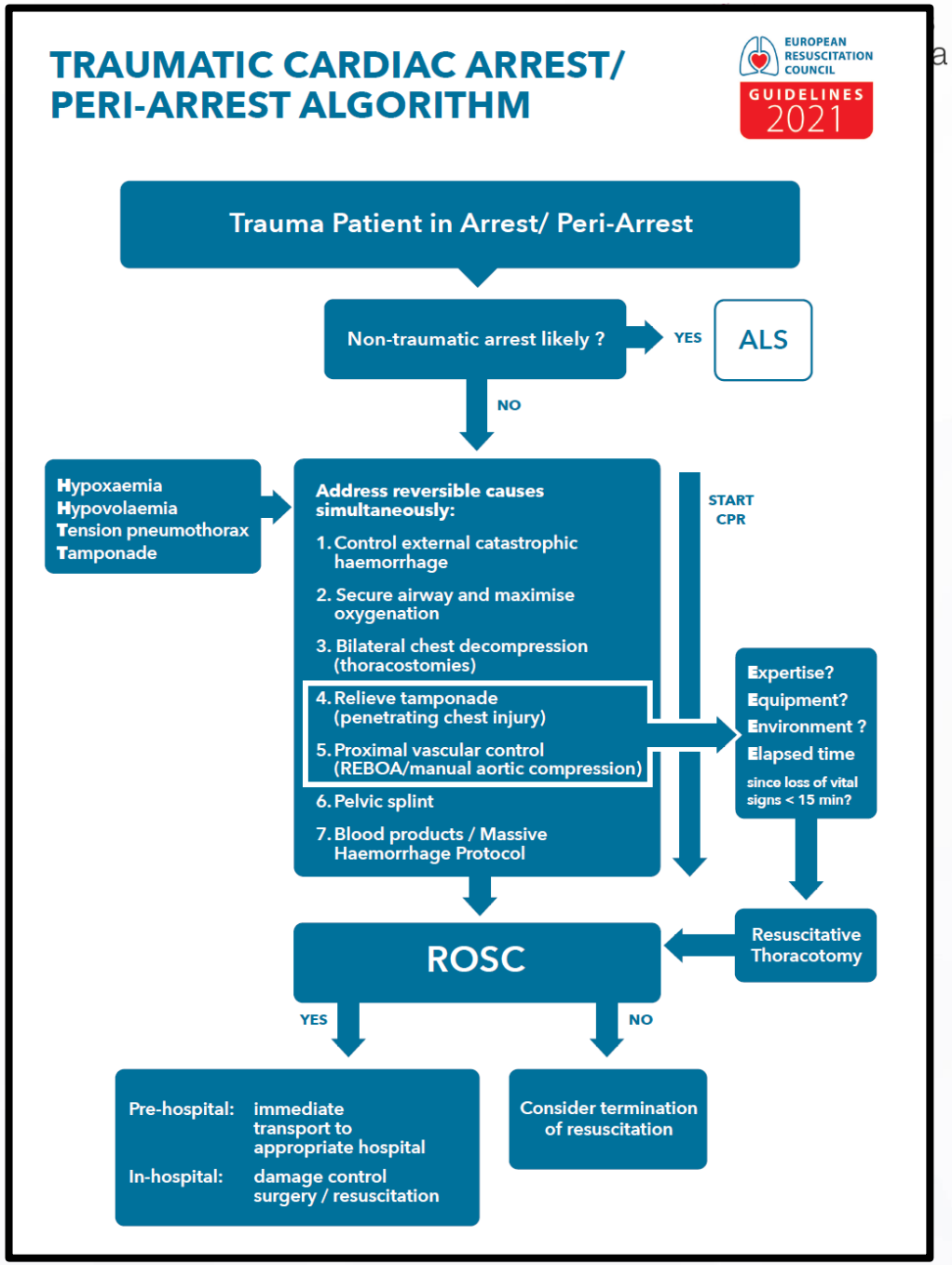
Hs y Ts SVA

- **HIPOXIA (ASFIXIA):** Optimizar ventilación y O2



Hs y Ts SVA

- **HIPOVOLEMIA / PCR TRAUMÁTICA:**
- ***"Don't pump an empty heart"***



OPEN

Prehospital use of pelvic circumferential compression devices in a physician-based emergency medical service: A 6-year retrospective cohort study

Tobias Zingg[1*], Romain Piaget-Rossel[2], Julie Stoppacher[3], Pierre-Nicolas Carron[4], Fabrice Dami[4], Olivier Borens[5], Roland Albrecht[6], Vincent Daroll[6], Patrick Taffé[2], Ludovic Maudet[4] & Mathieu Pasquier[4]

Fractures of the pelvic ring are a potential source of significant bleeding. Pelvic circumferential compression devices (PCCDs) can reduce and immobilize unstable fractures, but their hemostatic effect is unproven. Our aim was to assess the current practice of prehospital PCCD application and to identify factors available in the field predictive of significant pelvic ring injuries. All interventions (n = 13,435) in the Lausanne University Hospital Emergency Medical Service (EMS) were screened for PCCD placements from January 2008 to November 2014. Significant pelvic ring injuries (Tile types B or C) were considered as potentially benefitting from a PCCD. Data were extracted from the local prehospital registry. During the study period, 2366 trauma missions were performed. A PCCD was applied to 552/2366 (23%) patients. Significant pelvic ring injuries were present in 105/2366 (4.4%). Factors associated with the presence of significant pelvic ring injury were increased respiratory rate (OR 1.04), prolonged capillary refill time (OR 2.11), increased shock index (OR 3.91), pedestrians hit by a vehicle (OR 2.13), and presenting with falls from more than 2 m (OR 1.91). Among patients with a significant pelvic ring injury, a PCCD was placed in 79 (75%) and omitted in 26 (25%). One sixth of patients with a PCCD had a final diagnosis of significant pelvic ring injury. Further studies are needed to better understand which patient-, or accident-related factors are associated with prehospital PCCD omission among patients with significant pelvic ring injury.

Conclusions

In this large prehospital study, one out of six patients with a prehospital PCCD had a final diagnosis of a significant pelvic ring injury, whereas one out of four patients with a final diagnosis of a significant pelvic ring injury had no PCCD applied in the field. Further studies allowing for a better identification of patient-, physician- or accident-related factors associated with prehospital PCCD omission would be helpful to improve PCCD placement in the prehospital setting.

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frontiers in Surgery

REVIEW
published: 12 November 2020
doi: 10.3389/fsurg.2020.588845

Management of Pelvic Ring Injury Patients With Hemodynamic Instability

Meir Marmor[1*], *Ashraf N. El Naga*[1], *Jordan Barker*[1], *Jacob Matz*[1], *Styliani Stergiadou*[2] *and Theodore Miclau*[1]

[1] *Department of Orthopedic Surgery, University of California, San Francisco, San Francisco, CA, United States,* [2] *Faculty of Medicine, University of Thessaly, Larissa, Greece*

Pelvic ring injuries (PRI) are among the most difficult injuries to deal with in orthopedic trauma. When these injuries are accompanied by hemodynamic instability their

It has been estimated by (75) in a study of 27 post-mortem angiographies that only 11.1% of patients with pelvic fractures exhibit arterial bleeding. Otherwise, bleeding is primarily

the decision-making process. In this review we discuss the acute evaluation, triage and management of PRIs associated with hemodynamic instability. An evidence based and protocol driven approach is necessary in order to achieve optimal outcomes in these patients.

OPEN ACCESS

Edited by:

JOURNAL OF SURGICAL RESEARCH • ■ 2019 (■) 1–9

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Research review

Emerging Therapies for Prehospital Control of Hemorrhage

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[a] *Department of Surgery, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina*
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[c] *Department of Surgery, University of Cincinnati, Cincinnati, Ohio*

Gas insufflation

Bleeding from blunt abdominal torso trauma cannot be controlled by external pressure; therefore, iatrogenic abdominal hypertension via carbon dioxide (CO_2) insufflation to create internal pressure was explored as a potential prehospital intervention to slow bleeding. This idea was initially evaluated by Sava *et al.* by creating a 2.7-mm hole in the inferior vena cava using a vascular punch to cause bleeding in pigs.[10] The abdomen was then insufflated to 20 mm Hg using CO_2. Blood loss in the treatment group was decreased by 61% compared with the control group.[10]

Subsequently, abdominal insufflation was evaluated in a swine model of a grade V hepatic laceration created by a captive bolt gun.[11] The blood loss was 69% lower in the animals insufflated with CO_2 compared with the control animals.[11] Furthermore, mortality was 0% in the treatment group compared with 30% in the control group.[11] Insufflation was then assessed in a spleen injury model in swine to simulate a slower bleeding that would not be immediately lethal.[12] The abdomen was insufflated to a pressure of 20 mm Hg using a Veress needle on the opposite side of the abdomen after transecting the spleen into four pieces via wire distraction, and insufflation was maintained for 30 min.[12] Blood loss was nearly half in the abdominal insufflation group compared with the control group.[12] To operationalize this therapy, a 7-oz portable CO_2 tank was developed and validated in a porcine spleen injury model (Fig. 1). Optimal blood loss control was observed at abdominal pressures of 20 mm Hg, with iatrogenic abdominal compartment syndrome causing increased blood loss and lactate levels and decreased pH, at higher pressures (25 and 30 mm Hg).[13]

Although results from the animal models are encouraging

Fig. 1 – Portable insufflator. Reprinted with publisher's permission from *The Journal of Surgical Research*: from the study by Kasotakis et al.[13] Copyright 2013 Elsevier. (Color version of figure is available online.)

Prehospital External Aortic Compression for Temporizing Exsanguinating Sub-Diaphragmatic Hemorrhage – A Promising Technique, but with Challenges: Four Illustrative Cases, Including Two Survivors

Bruce Richard Paix, MBBS, FANZCA;[1] David John Tingey, BHlthSc(Paramedic), MAdvClinPrac;[2] Grant Copley, BHlthSc(Amb), MPH(Aeromed);[2] Matthew Casson, BNurs, GDipNSc(Cardiac);[1] Damien Shoolbread, BNurs, GradCert Hlth(Critical Care);[1] Hari Davuluru, MBBS, DCH;[1] James Doube, BMBS(Hons), FACRRM;[1] Wade Emmerton, RN, BHS(Paramedic);[1] Ryan Kennedy, BHlthSc(Amb)[2]

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Abstract

External aortic compression (EAC) has long been used to control exsanguinating post-partum hemorrhage, but it has only recently been described in the prehospital trauma setting. This paper reports four cases where manual EAC was used during transport to manage life-threatening bleeding, twice from stab wounds, once from ruptured ectopic pregnancy, and once from severe lower-limb trauma. It showed that EAC has life-saving potential in the prehospital setting, but that safety and efficacy during transport requires the use of a hands-free compression device, such as an aortic tourniquet.

Paix BR, Tingey DJ, Copley G, Casson M, Shoolbread D, Davuluru H, Doube J, Emmerton W, Kennedy R. Prehospital external aortic compression for temporizing exsanguinating sub-diaphragmatic hemorrhage – a promising technique, but with challenges: four illustrative cases, including two survivors. *Prehosp Disaster Med.* 2020;00(00):1–4.

"hands-free" method is required. The pneumatic Abdominal Aortic & Junctional Tourniquet (AAJT - Compression Works LLC; Birmingham, Alabama USA) appears promising in this setting,[11,12] and it is currently being evaluated by the South Australian Ambulance Service. Such a device may also reduce

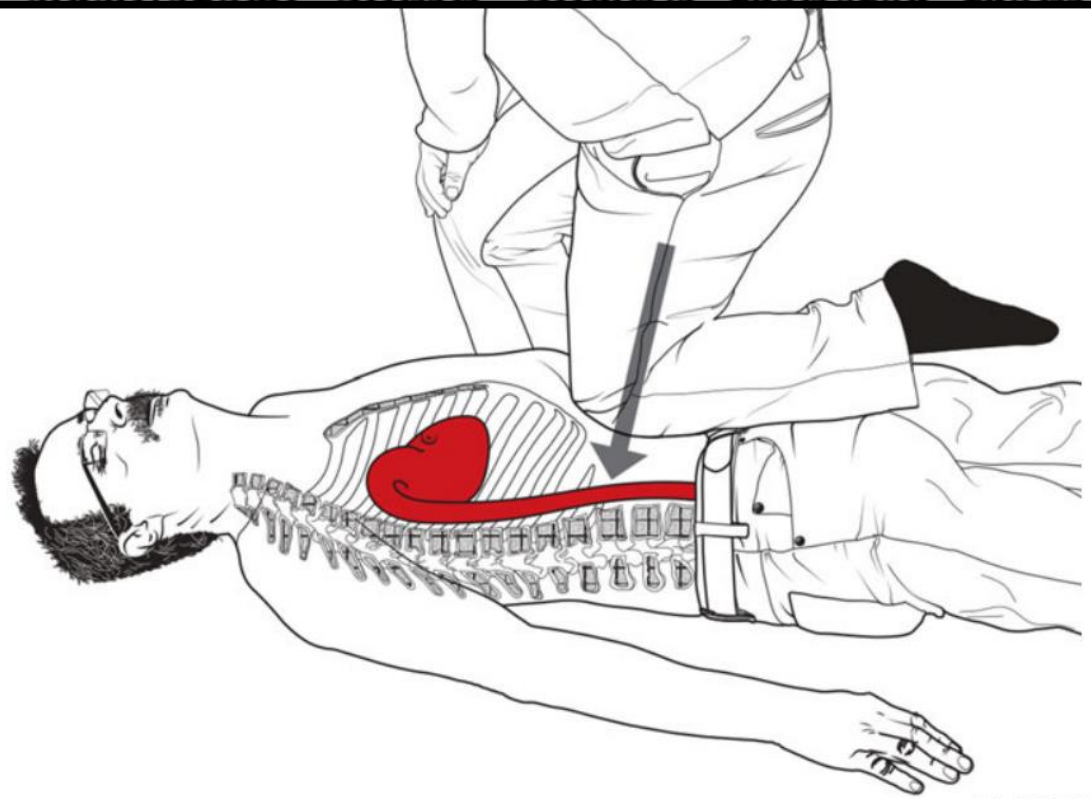
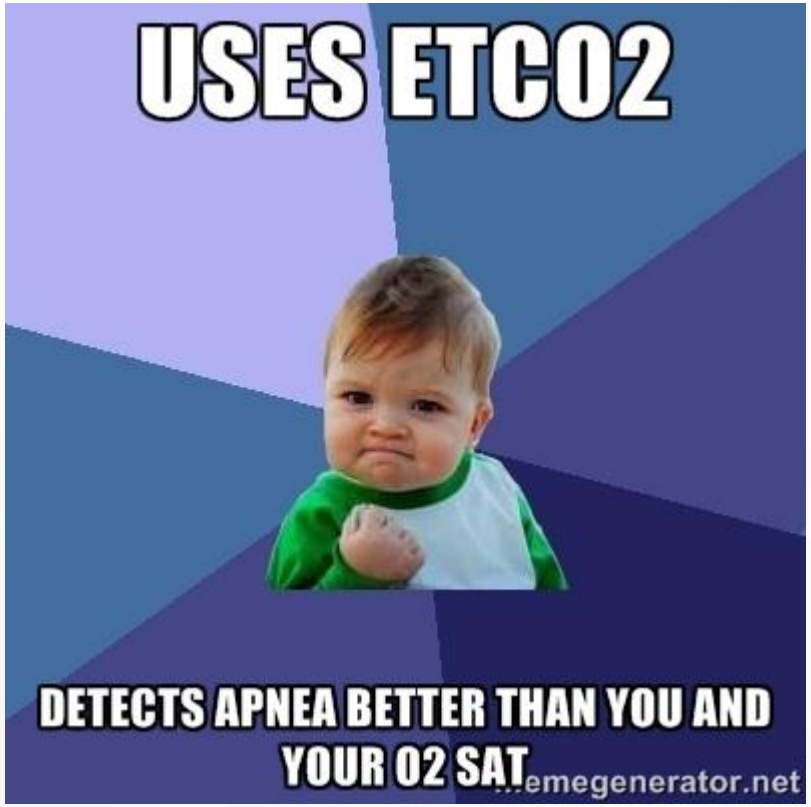


Figure 1. Manual External Aortic Compression May Best be Performed with a Knee.

Hs y Ts SVA

- **HIPOVOLEMIA – ANAFILAXIA: Adrenalina im 0,5mg x 2 (5 min)**



Hs y Ts SVA

- **HIPOVOLEMIA – SÉPSIS:**
  - Medir lactato
  - Hemocultivos precoces
  - ATB amplio espectro precoç
  - Cristaloides 30 ml/Kg si hTA o lactato > 4
  - Vasopresores para TAM 60 a 70 mmHg

5 MYTHS of LACTATE in sepsis

@FrancoMaycol

adapted from P. Marik, Crit Care Med 2018

1 LACTATE IS A MARKER OF ANAEROBIC METABOLISM

In the setting of sepsis and septic shock an increased lactate is the result of increased beta 2 adrenergic activation rather than of end-organ hypoperfusion.

Aerobic glycolysis is upregulated by catecholamines generating more pyruvate and pyruvate dehydrogenase is dysfunctional, so more pyruvate is shifted to lactate.

2 LACTATE IS AN INDICATOR OF INADEQUATE OXYGEN DELIVERY

Most patients with sepsis and elevated lactate have hyperdynamic circulation with very adequate delivery of oxygen to the tissues.

The notion of increasing oxygen delivery to achieve some lactate concentration (or lactate clearance) has universally failed to improve patient outcomes.

3 NORMALIZATION OF LACTATE IS A RESUSCITATION TARGET

While a fairly robust body of evidence suggests serum lactate can serve as a prognostic tool, it does not demonstrate that our active attempts to lower lactate levels lead to improved outcomes.

Furthermore, recent publications suggest potential harms associated with the use of a lactate guided approach in comparison to a capillary refill time strategy.

4 LACTATE CAUSES AN ACIDOSIS

The conversion of pyruvate to lactate consumes rather than produces a hydrogen ion. Therefore lactate production retards, not causing an acidosis.

The cause of the acidosis in these patients is not exactly clear; the hydrolysis of ATP has been one explanation that has been proposed.

5 DO NOT USE LR IN PATIENTS WITH HIGH LACTATE

Lactated Ringer's contains sodium lactate and not lactic acid and is therefore not acidotic. Anyway it usually has minimal effect on serum lactate levels so it won't impair your ability to measure them.

Even if used in patients with cirrhosis or hepatic injury LR would still be safe.

- Measure lactate level. Remeasure if initial lactate is >2 mmol/L.
- Obtain blood cultures prior to administration of antibiotics.
- Administer broad-spectrum antibiotics.
- Begin rapid administration of 30ml/kg crystalloid for hypotension or lactate ≥4 mmol/L.
- Apply vasopressors if patient is hypotensive during or after fluid resuscitation to maintain MAP ≥65 mm Hg.

*"Time zero" or "time of presentation" is defined as the time of triage in the Emergency Department or, if presenting from another care venue, from the earliest chart annotation consistent with all elements of sepsis (formerly severe sepsis) or septic shock ascertained through chart review.

Fig. 1 Hour-1 Surviving Sepsis Campaign Bundle of Care

Table 1 Bundle elements with strength of recommendations and under-pinning quality of evidence [12, 13]

Bundle element	Grade of recommendation and level of evidence
Measure lactate level. Re-measure if initial lactate is > 2 mmol/L	Weak recommendation, low quality of evidence
Obtain blood cultures prior to administration of antibiotics	Best practice statement
Administer broad-spectrum antibiotics	Strong recommendation, moderate quality of evidence
Rapidly administer 30 ml/kg crystalloid for hypotension or lactate ≥ 4 mmol/L	Strong recommendation, low quality of evidence
Apply vasopressors if patient is hypotensive during or after fluid resuscitation to maintain MAP ≥ 65 mm Hg	Strong recommendation, moderate quality of evidence

Fluid Response Evaluation in Sepsis Hypotension and Shock

A Randomized Clinical Trial

Take-home Points

Study Question: Will resuscitation guided by dynamic assessments of fluid responsiveness in patients with septic shock improve patient outcomes?

Results: In this multicenter randomized controlled trial of 124 patients with septic shock, treatment that was guided by a dynamic assessment of fluid responsiveness (passive leg raise) compared with usual care resulted in a decreased fluid balance (0.65 L vs 2.02 L). Fewer patients required renal replacement therapy (5.1% vs 17.5%) or mechanical ventilation (17.7% vs 34.1%), and patients were more likely to be discharged home alive (63.9% compared with 43.9%).

Interpretation: Personalized, dynamic fluid responsiveness monitoring enhances appropriate resuscitation fluid and vasopressors administration and improves patient outcomes.

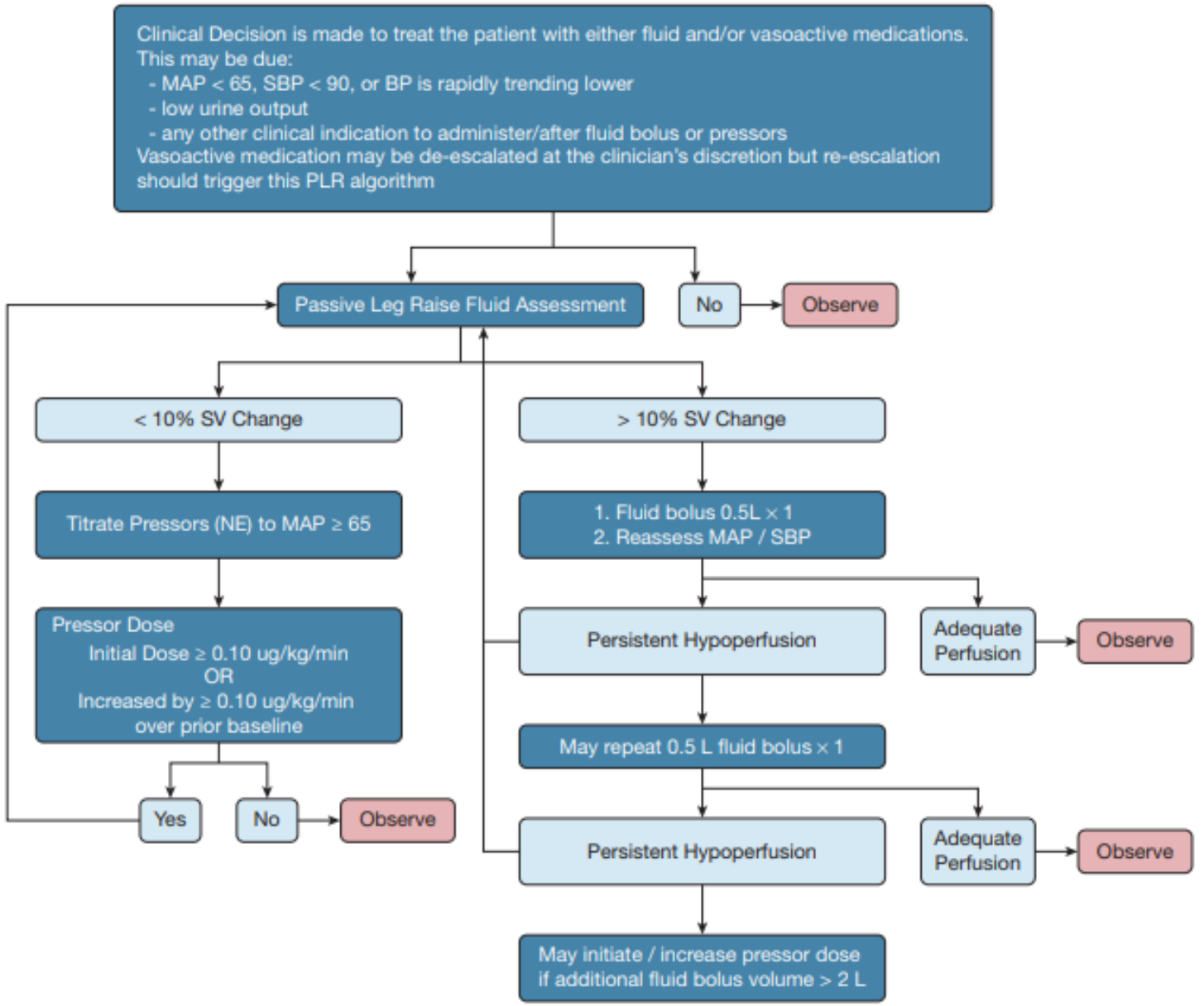


Figure 1 – *Flow chart model of the algorithm used to guide treatment in the Fluid Responsiveness Evaluation in Sepsis-associated Hypotension study. MAP = mean arterial pressure; NE = norepinephrine; PLR = passive leg raise; SBP = systolic BP; SV = stroke volume.*

- Measure lactate level. Remeasure if initial lactate is >2 mmol/L.
- Obtain blood cultures prior to administration of antibiotics.
- Administer broad-spectrum antibiotics.
- Begin rapid administration of 30ml/kg crystalloid for hypotension or lactate ≥4 mmol/L.
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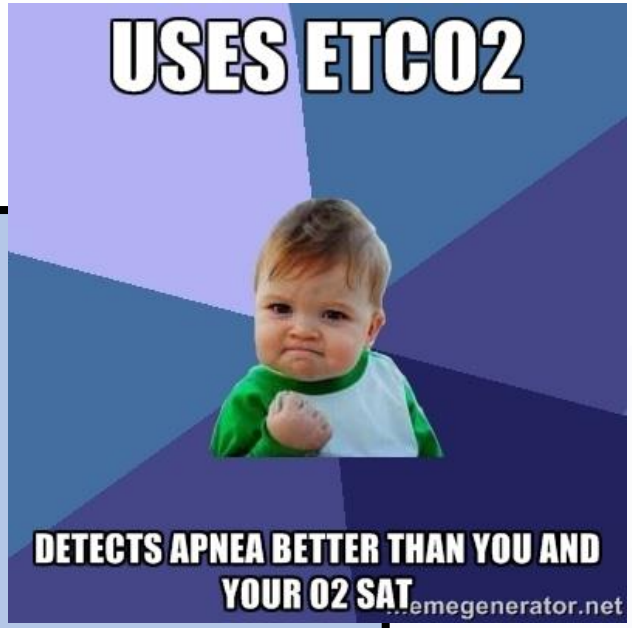
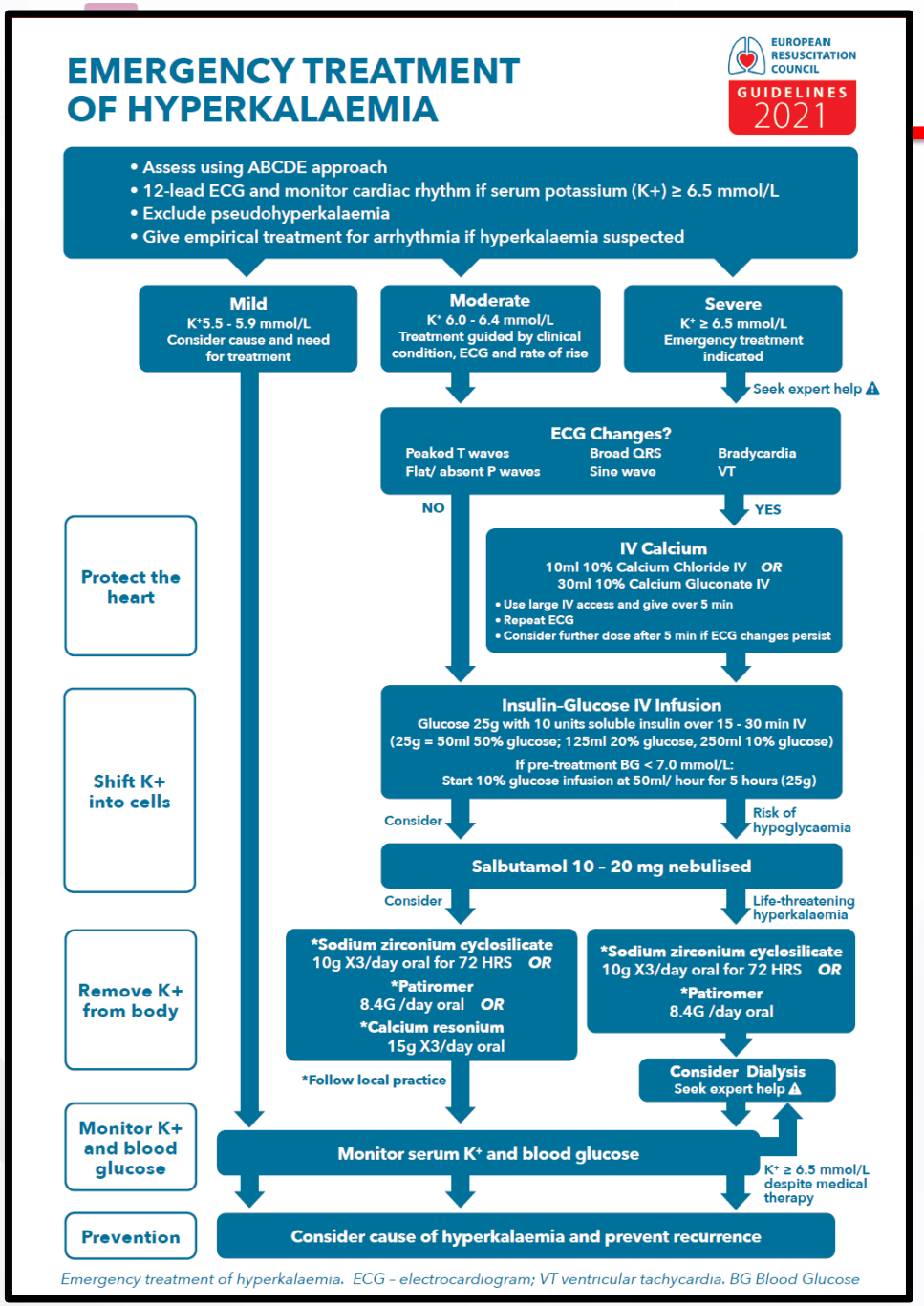
Hs y Ts SVA



PCR EN SEPSIS:

- ALGORITMO SVA
- IOT Y OXIGENACION
- BOLOS 500ML CRISTALOIDE Y VALORAR READMINISTRAR
- OBTENER GASO VENOSA, LACTATO Y ELECTROLITOS

Hs y Ts SVA



Emergency treatment of hyperkalaemia. ECG – electrocardiogram; VT ventricular tachycardia. BG Blood Glucose

Patient in cardiac arrest

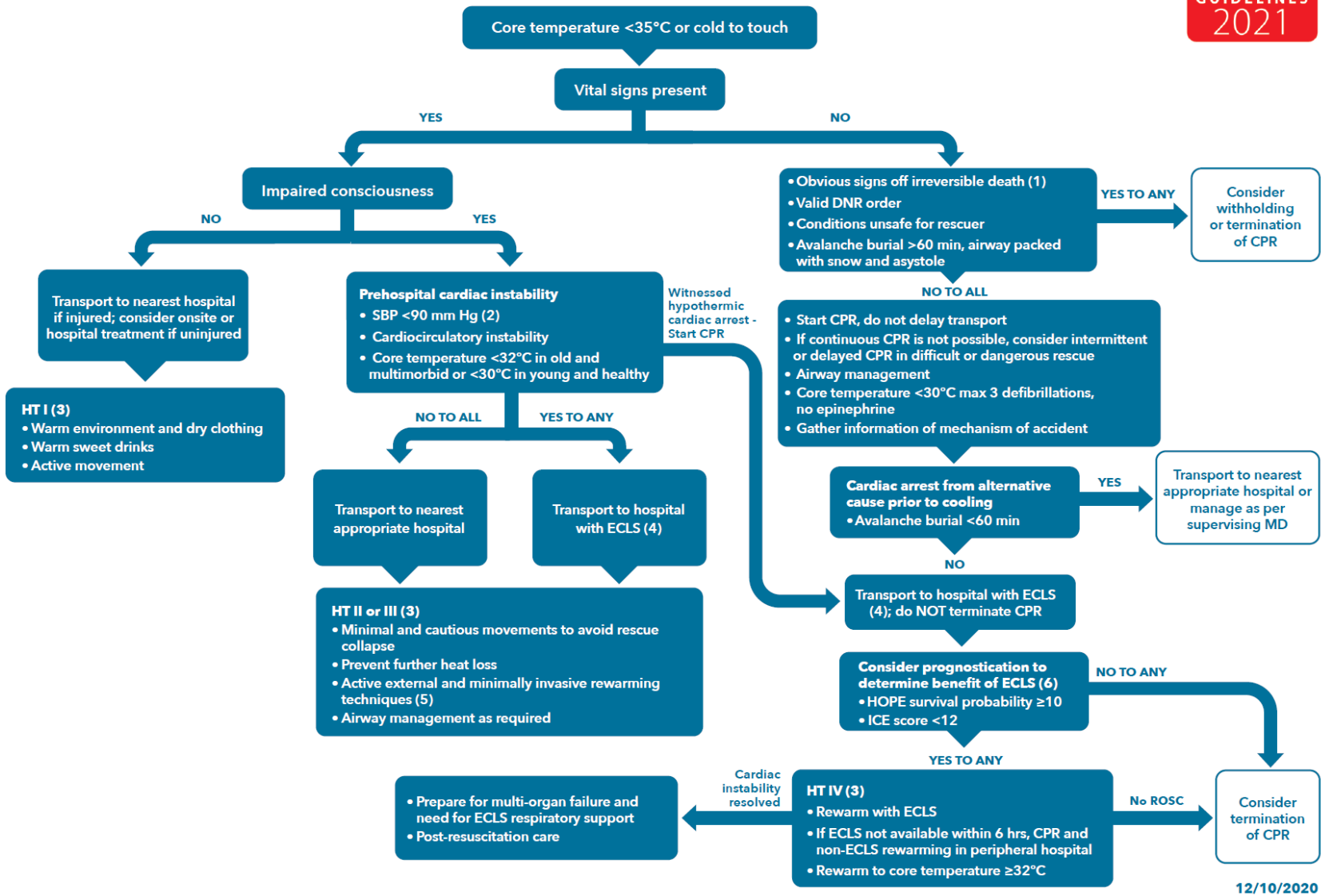
- Confirm hyperkalaemia using blood gas analyser if available.
- Protect the heart: Give 10 ml calcium chloride 10% IV by rapid bolus injection. Consider repeating dose if cardiac arrest is refractory or prolonged.
- Shift K^+ into cells: Give 10 units soluble insulin and 25 g glucose IV by rapid injection. Monitor blood glucose. Administer 10% glucose infusion guided by blood glucose to avoid hypoglycaemia.
- Shift K^+ into cells: Give 50 mmol sodium bicarbonate (50 ml 8.4% solution) IV by rapid injection.
- Remove K^+ from the body: Consider dialysis for refractory hyperkalaemic cardiac arrest.
- Consider the use of a mechanical chest compression device if prolonged CPR is needed.
- Consider ECLS or ECPR for patients who are peri-arrest or in cardiac arrest as a rescue therapy in those settings where it is feasible.

Hs y Ts SVA

- **HIPOTERMIA:**
  - IMP ECMO + Scores HOPE y ICE (NO K+ o Tª)
  - ¿MCE intermitente?
  - Nuevo algoritmo **avalancha**:
    - 5 ventilaciones de rescate
    - SVA normal si < 60 min+ECMO si > 60 min sin VA obstruïda ni lesiones incompatibles

ACCIDENTAL HYPOTHERMIA

EUROPEAN RESUSCITATION COUNCIL
GUIDELINES 2021



HOPE

Hypothermia Outcome Prediction after ECLS

Table 4 Components of the HOPE Score and ICE Score

HOPE Score [12]	ICE Score [13]
Gender	Gender
Asphyxiation with hypothermia	Asphyxiation with hypothermia
First serum potassium	First serum potassium
Age	
Cardiopulmonary resuscitation duration	
Core temperature at admission	

Predicción del resultado de hipotermia después del soporte vital extracorpóreo para pacientes con paro cardíaco hipotérmico. Estimación de las probabilidades de supervivencia mediante HOPE.

RESUSCITATION

EUROPEAN RESUSCITATION COUNCIL

Iniciar sesión como miembro de ERC Iniciar sesión
Registrarse Afirmar

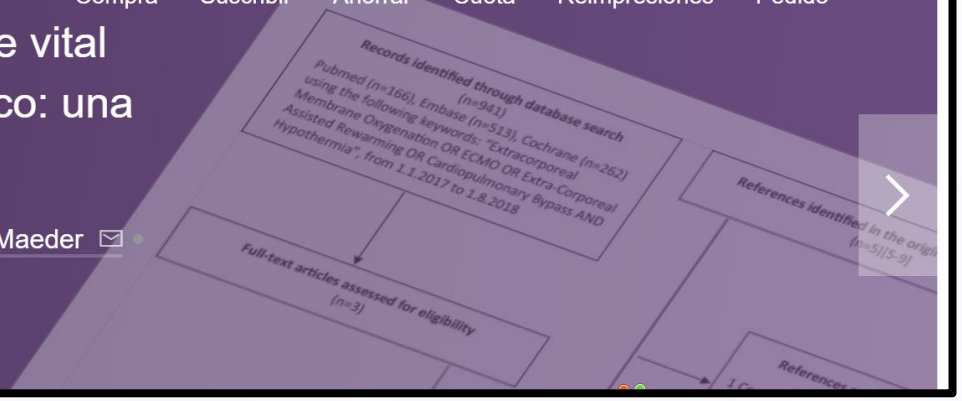
Compra Suscribir Ahorrar Cuota Reimpresiones Pedido

ARTÍCULO CLÍNICO | VOLUMEN 139, P321-328,01 DE JUNIO DE 2019

Predicción del resultado de hipotermia después del soporte vital extracorpóreo para pacientes con paro cardíaco hipotérmico: una validación externa de la puntuación HOPE

Mathieu Pasquier • Valentin Rousson • Tomasz Darocha • ... Monika Brodmann Maeder • Peter Paal • Olivier Hugli • Mostrar todos los autores

Publicado: 30 de marzo de 2019 • DOI: https://doi.org/10.1016/j.resuscitation.2019.03.017 •



ls y Ts SVA

AVALANCHE RESCUE

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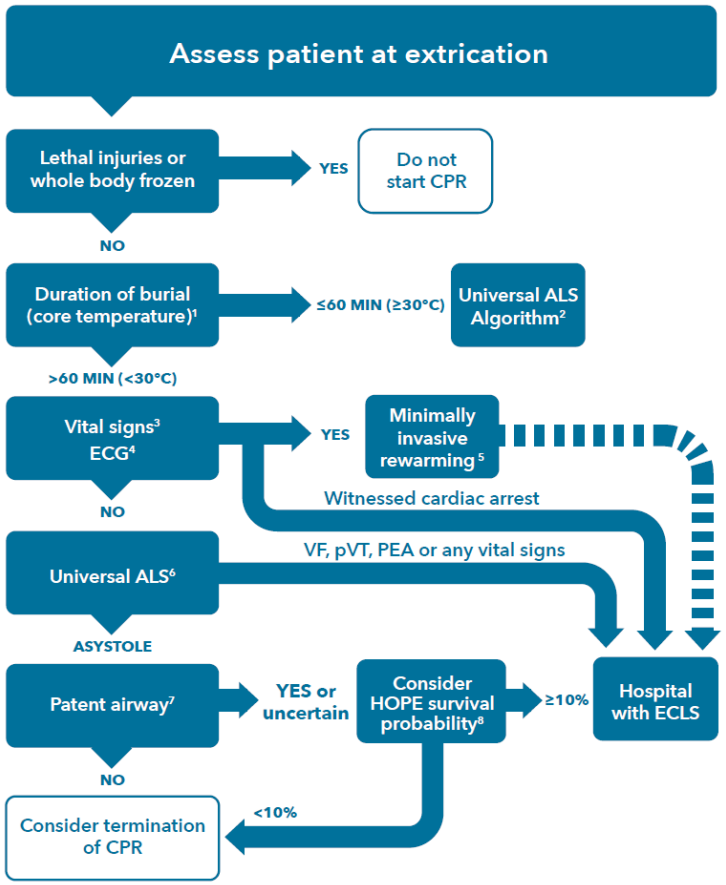

8. If HOPE is not possible, serum potassium and core temperature (cut-offs 7 mmol/L and 30°C) can be used but may be less reliable.

Abbreviations: ALS Advanced life support, CPR cardiopulmonary resuscitation, ECLS extracorporeal life support, PEA pulseless electrical activity, pVT pulseless ventricular tachycardia, SaO_2 arterial oxygen saturation, VF ventricular fibrillation

ICPR

DELAYED AND INTERMITTENT CPR IN HYPOTHERMIC PATIENTS WHEN CONTINUOUS CPR IS NOT POSSIBLE DURING DIFFICULT RESCUE MISSIONS

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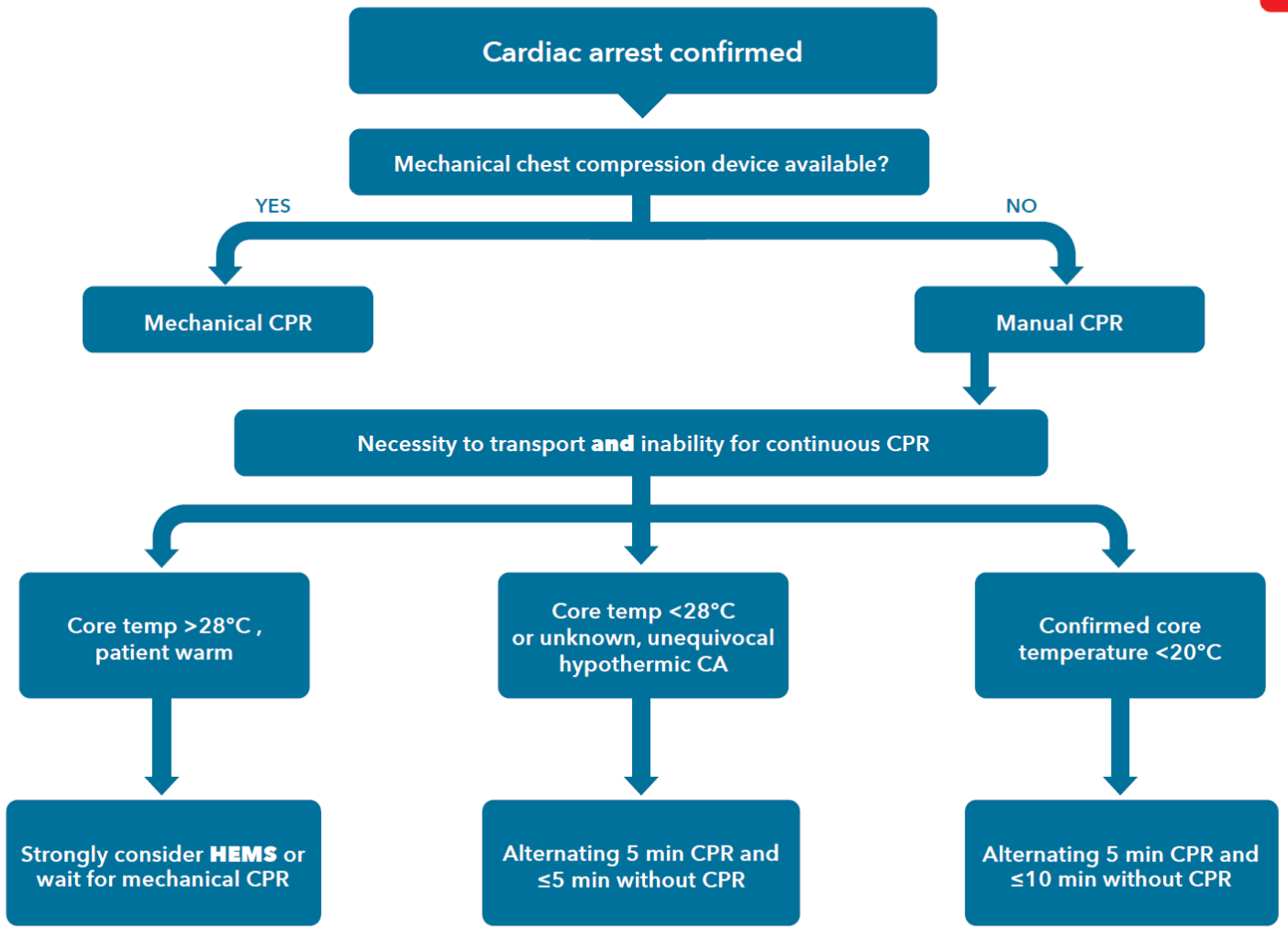


GRUP CATALÀ URGÈNCIES I EMERGÈNCIES
Infermeres de Catalunya

Infermeres de Catalunya

SPECIAL CIRCUMSTANCES 2021

EUROPEAN RESUSCITATION COUNCIL

ACCIDENTAL HYPOTHERMIA

KEY EVIDENCE

Vital signs should be checked for 1 minute by clinical examination, ECG, EtCO2 and ultrasound

Arrested hypothermic patients should, where possible, be directly transferred to an ECLS centre for rewarming

In-hospital prognostication of successful ECLS rewarming should be based on the HOPE or ICE score, serum potassium prognostication is less reliable

HYPERTHERMIA

EUROPEAN RESUSCITATION COUNCIL GUIDELINES 2021

Require CPR? YES → Universal ALS algorithm

NO → Use a temperature probe

Core temperature >40.5°C YES → Rapid cooling (cold water immerssion)

NO → Core temperature ≤40.5°C, & confused/ desoriented YES → Rapid cooling (cold water immerssion)

Bathtub, ½ to ¾ filled water & ice, 1-17°C, stirred or circulated

TIME IS KEY: COOL AND RUN APPROACH

- Cool first, transfer to hospital after
- Immediate cooling
- Rapidly cool to <39°C until symptoms resolve

Rapid cooling (cold water immerssion) → Stop cooling at core temperature <39°C → Continue monitoring for at least 15 min after cooling
- Rehydrate as required
- Check for improved mental status
- Avoid accidental hypothermia (<35°C)

NO → Blood sodium <130 mEq/L YES → If abnormal mental state initiate IV 100ml bolus of 3% saline at 10 min intervals, 2nd and 3rd bolus only if required. If normal mental state administer oral sodium → Hyponatraemia algorithm

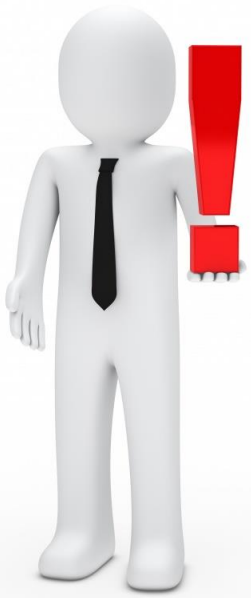
NO → Severely dehydrated? YES → If abnormal mental state administer IV normal saline or Ringer's lactated. If normal mental state provide oral rehydration and sodium

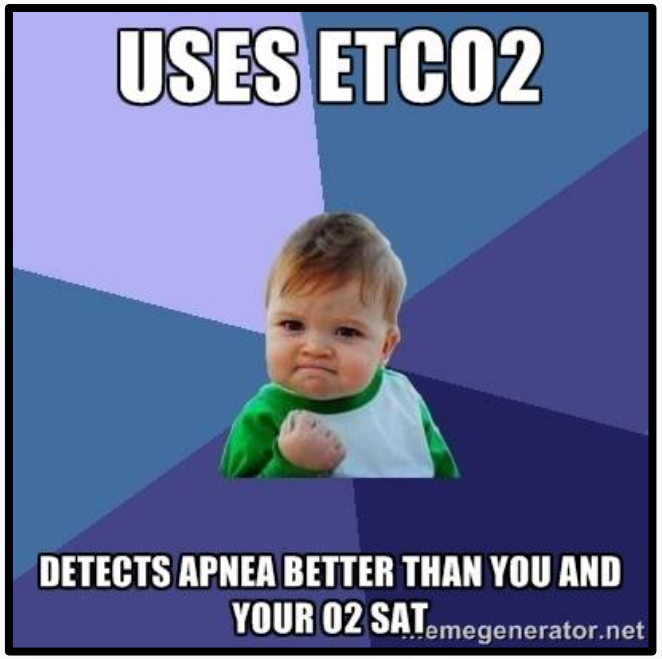
NO → Other symptoms YES → Appropriate algorithm e.g. Hypoglycaemia

Other symptoms NO → Release with exercise restrictions

Hs y Ts SVA

- **TEP:**
  - Sospechar si hay disnea brusca y NO enfermedad pulmonar
  - OJO DDif NAT o Anafilaxia
  - Lisis + RCP 60 a 90 min
  - ¿ECMO?





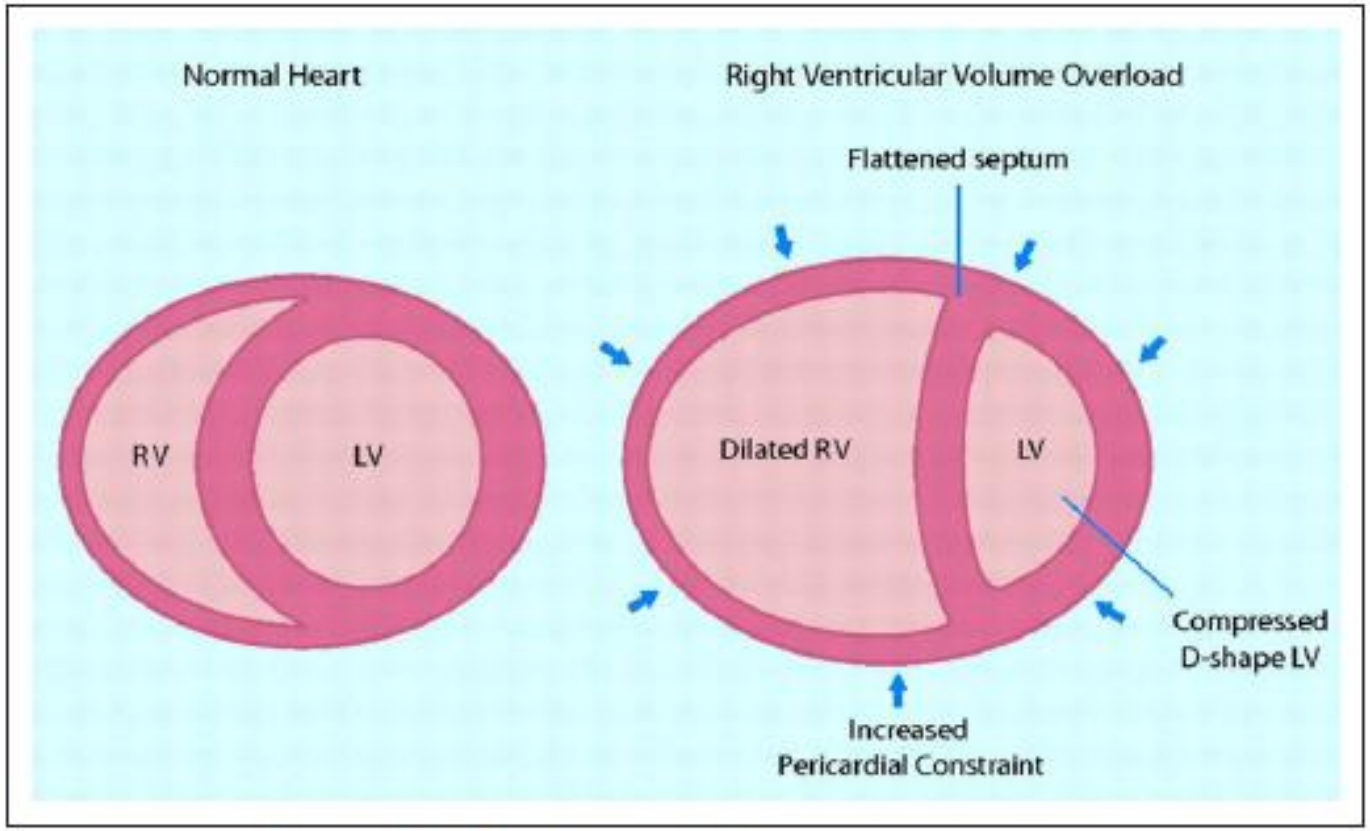


Figure 6. Ventricular interdependence in right-sided heart failure.
Pathological increases in right ventricular (RV) filling pressures are transmitted to the interventricular septum. As the RV is constrained by the pericardium (**arrows**), these forces result in leftward shift of the septum, altering left ventricular (LV) geometry. These changes contribute to reduced cardiac output by decreasing LV distensibility, preload, and ventricular elastance, adversely affecting LV diastolic filling. Leftward septal shift secondary to pericardial constraint from elevated RV end-diastolic pressure distorts the normal geometric ventricular relationship, also impairing RV contractile function. Adapted from Haddad et al[18] with permission.

CORONARY THROMBOSIS

EUROPEAN RESUSCITATION COUNCIL
GUIDELINES 2021

1. Prevent and be prepared

- Encourage cardiovascular prevention to reduce the risk of acute events
- Promote health education to reduce delay to first medical contact
- Promote laypeople BLS to increase the chance of bystander CPR
- Ensure adequate resources for better management
- Improve quality management systems & indicators for better quality monitoring

2. Detect parameters suggesting coronary thrombosis & Activate STEMI network

- Chest pain prior to arrest
- Known coronary artery disease
- Initial rhythm VF or pVT
- Post-resuscitation ECG: ST elevation

3. Resuscitate and treat possible causes

Sustained ROSC

STEMI patients

Time from diagnosis to PCI

< 120 min

Activate PCI laboratory
Transfer for immediate PCI

> 120 min

Perform pre-hospital fibrinolysis
Transfer to PCI centre

No STEMI patients

Individualise decisions considering patient characteristics, OHCA setting, ECG findings

Quick diagnostic work up

Discard non-coronary causes
Chest patient condition

If there is on going ischaemia or haemodynamic compromise?

Yes - immediate PCI

No - consider delayed PCI

No Sustained ROSC

Assess setting & patient conditions and available resources

If futility:

Consider stopping CPR

If no futility:

Consider transfer to PCI centre with on-going CPR

Consider mechanical compressions and extra-corporeal CPR

Consider PCI

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RESUSCITATION XXX (2020) XXX –XXX

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Resuscitation

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Clinical paper

Immediate coronary angiogram in out-of-hospital cardiac arrest patients with non-shockable initial rhythm and without ST-segment elevation — Is there a clinical benefit?

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Abstract

Aim: Coronary angiogram (CA) may be useful after resuscitated out-of-hospital cardiac arrest (OHCA), but data regarding its benefit in patients with non-shockable initial rhythm without ST-segment elevation is scarce. We aimed to evaluate the prevalence of acute coronary syndrome (ACS) and survival in OHCA patients with non-shockable initial rhythm without ST-segment elevation and compare them to patients with shockable initial rhythm without ST-segment elevation.

Methods: Retrospective single-centre study approved by the ethics committee of our institution, including adults successfully resuscitated from OHCA of presumed cardiac cause, undergoing routine CA on admission. Baseline characteristics, angiographic data including presence of ACS and survival were compared between patients with non-shockable and shockable initial rhythm focusing on patients without ST-segment elevation.

Results: Among 517 patients included between 2002 and 2018, 311 had no ST-elevation, of whom 179 had non-shockable and 132 shockable initial rhythm. Compared with shockable initial rhythm patients without ST-elevation, non-shockable initial rhythm patients without ST-elevation had longer no-flow duration, 5 (1–10) versus 2 (0–8) min, $p = 0.024$, more frequent shock requiring vasopressors, 72% versus 47% $p < 0.0001$, a lower prevalence of ACS, 2 (1%), versus 29 (22%), $p < 0.001$ and higher mortality, 85% versus 39% ($p < 0.0001$). Among ACS patients, none survived in the non-shockable without ST-elevation group, while 20 (69%) survived in the shockable rhythm without ST-elevation group.

Conclusions: Prevalence of ACS in patients without ST-segment elevation and non-shockable initial rhythm is extremely low, and survival extremely poor, therefore routine emergency CA does not seem beneficial in these patients.

Keywords: Non-shockable initial rhythm, Out-of-hospital cardiac arrest, Coronary angiogram, Acute coronary syndrome

CARDIAC CATHETERISATION LABORATORY

EUROPEAN RESUSCITATION COUNCIL GUIDELINES 2021

1. Prevent and be prepared

- Ensure adequate training of the staff in technical skills and ALS
- Ensure availability and that equipment is functioning
- Use safety checklists

2. Detect cardiac arrest and activate cardiac arrest protocol

- Check patient's status and monitored vital signs regularly
- Consider cardiac echocardiogram in case of haemodynamic instability or suspected complication
- Shout for help and activate cardiac arrest protocol

3. Resuscitate and treat possible causes

VF / pVT cardiac arrest

Defibrillate (apply up to 3 consecutive shocks)

No ROSC

Asystole / PEA

- Resuscitate according to ALS algorithm
- Check and correct potentially reversible causes including echocardiography and angiography
- Consider mechanical chest compression and circulatory support devices (including extracorporeal-CPR)

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CARDIAC SURGERY

EUROPEAN RESUSCITATION COUNCIL
GUIDELINES 2021

1. Prevent and be prepared

- Ensure adequate training of the staff in technical skills and ALS
- Ensure availability and well-functioning of emergency equipment
- Use safety checklists

2. Detect cardiac arrest and activate cardiac arrest protocol

- Identify and manage deterioration in the post-operative cardiac patient
- Consider echocardiography
- Confirm cardiac arrest by clinical signs and pulseless waveforms
- Shout for help and activate cardiac arrest protocol

3. Resuscitate and treat possible causes

VF/pVT	Asystole / extreme bradycardia	PEA
Defibrillate (apply up to 3 consecutive shocks)	Apply early pacing	Correct potentially reversible causes Turn off pacing to exclude VF

No ROSC

- Initiate compressions and ventilation
- Perform early **resteronotomy** (<5 min)
- Consider circulatory support devices and extracorporeal-CPR

Infermeres de Catalunya

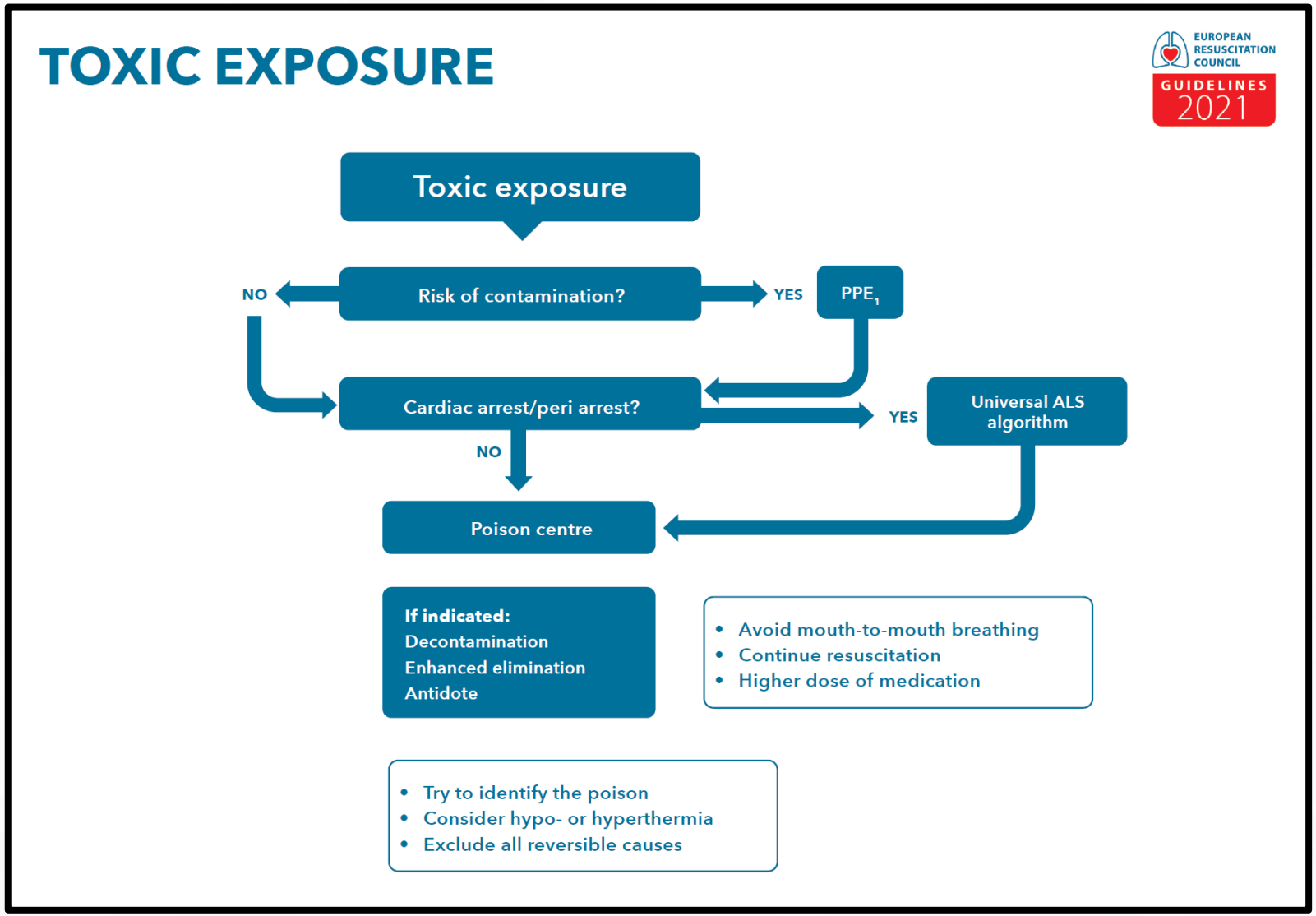

desmotivaciones.es
Porque yo tampoco
nunca veo nada.

Hs y Ts SVA

- **TAPONAMIENTO CARDIACO:**
- **NAT:**

Hs y Ts SVA

- **INTOXICACIONES:**
  - ¿EPI?
  - NO boca a boca
  - Pensar electrolitos
  - Pensar Tª
  - Valorar prolongar tiempo RCP
  - CNT
  - ¿ECMO?



Hs y Ts SVA

- **DIÁLISIS:**
  - . Parar y retornar sangre
  - . Desconectar de la maquina
  - . Utilizar catéter para drogas
  - . OJO K+
- **DENTISTA:**

Hs y Ts SVA

- **ASMA:**

Manage

Features of acute severe asthma

- Peak expiratory flow (PEF) 33–50% of best (use % predicted if recent best unknown)
- Can't complete sentences in one breath
- Respiration ≥25 breaths/min
- Pulse ≥110 beats/min

Life-threatening features

- PEF <33% of best or predicted
- SpO_2 <92%
- Silent chest, cyanosis, or poor respiratory effort
- Arrhythmia or hypotension
- Exhaustion, altered consciousness

If a patient has any life-threatening feature, measure arterial blood gases. No other investigations are needed for immediate management.

Blood gas markers of a life-threatening attack:

- 'Normal' (4.6–6 kPa, 35–45 mmHg) $PaCO_2$
- Severe hypoxia: PaO_2 <8 kPa (60 mmHg) irrespective of treatment with oxygen
- A low pH (or high H^+)

Caution: Patients with severe or life-threatening attacks may not be distressed and may not have all these abnormalities. The presence of any should alert the doctor.

Near-fatal asthma

- Raised $PaCO_2$
- Requiring mechanical ventilation with raised inflation pressures

Management of acute asthma in adults in hospital

Features of acute severe asthma

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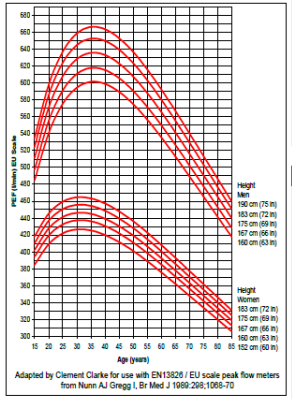
Peak Expiratory Flow Rate - Normal Values



Adapted by Clement Clarke for use with EN13826 / EU scale peak flow meters from Nunn AJ Gregg I, Br Med J 1989;298;1068-70

IMMEDIATE TREATMENT

- Oxygen to maintain SpO_2 94–98%
- β_2 bronchodilator (salbutamol 5 mg) via an oxygen-driven nebuliser
- Ipratropium bromide 0.5 mg via an oxygen-driven nebuliser
- Prednisolone tablets 40–50 mg or IV hydrocortisone 100 mg
- No sedatives of any kind
- Chest X-ray if pneumothorax or consolidation are suspected or patient requires mechanical ventilation

IF LIFE-THREATENING FEATURES ARE PRESENT:

- Discuss with senior clinician and ICU team
- Consider IV magnesium sulphate 1.2–2 g infusion over 20 minutes (unless already given)
- Give nebulised β_2 bronchodilator more frequently eg salbutamol 5 mg up to every 15-30 minutes or 10 mg per hour via continuous nebulisation (requires special nebuliser)

SUBSEQUENT MANAGEMENT

IF PATIENT IS IMPROVING continue:

- Oxygen to maintain SpO_2 94–98%
- Prednisolone 40–50mg daily or IV hydrocortisone 100 mg 6 hourly
- Nebulised β_2 bronchodilator with ipratropium 4–6 hourly

IF PATIENT NOT IMPROVING AFTER 15–30 MINUTES:

- Continue oxygen and steroids
- Use continuous nebulisation of salbutamol at 5–10 mg/hour if an appropriate nebuliser is available. Otherwise give nebulised salbutamol 5 mg every 15–30 minutes
- Continue ipratropium 0.5 mg 4–6 hourly until patient is improving

IF PATIENT IS STILL NOT IMPROVING:

- Discuss patient with senior clinician and ICU team
- Consider IV magnesium sulphate 1.2–2 g over 20 minutes (unless already given)
- Senior clinician may consider use of IV β_2 bronchodilator or IV aminophylline or progression to mechanical ventilation

MONITORING

- Repeat measurement of PEF 15–30 minutes after starting treatment
- Oximetry: maintain SpO_2 >94–98%
- Repeat blood gas measurements within 1 hour of starting treatment if:
  - initial PaO_2 <8 kPa (60 mmHg) unless subsequent SpO_2 >92% or
  - $PaCO_2$ normal or raised or
  - patient deteriorates
- Chart PEF before and after giving β_2 bronchodilator and at least 4 times daily throughout hospital stay

Transfer to ICU accompanied by a doctor prepared to intubate if:

- Deteriorating PEF, worsening or persisting hypoxia, or hypercapnia
- Exhaustion, altered consciousness
- Poor respiratory effort or respiratory arrest

DISCHARGE

When discharged from hospital, patients should have:

- Been on discharge medication for 12–24 hours and have had inhaler technique checked and recorded
- PEF >75% of best or predicted and PEF diurnal variability <25% unless discharge is agreed with respiratory physician
- Treatment with **oral steroids (prednisolone 40–50 mg until recovery - minimum 5 days) and inhaled steroids** in addition to bronchodilators
- Own PEF meter and **written asthma action plan**
- GP follow up arranged within **2 working days**
- Follow-up appointment in respiratory clinic **within 4 weeks**

Patients with severe asthma (indicated by need for admission) **and adverse behavioural or psychosocial features are at risk of further severe or fatal attacks.**

- Determine reason(s) for exacerbation and admission
- Send details of admission, discharge and potential best PEF to GP

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[HTML] Diagnostic value of volumetric **capnography** in patients with chronic cough variant **asthma**

[HTML] scielo.br

X Sun, W Yang, S Gong, S Liang, S Gu, H Lu, J Liu… - Clinics, 2020 - SciELO Brasil

OBJECTIVES: To evaluate the quantitative changes and diagnostic performance of volumetric **capnography** (VCap) parameters in patients with cough variant **asthma**. METHODS: This cross-sectional study enrolled 31 patients with cough variant **asthma** and …

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[HTML] Volumetric **capnography** versus spirometry for the evaluation of pulmonary function in cystic fibrosis and allergic **asthma**

[HTML] sciencedirect.com

A Almeida-Junior, FAL Marson, CCB Almeida… - Jornal de Pediatria …, 2020 - Elsevier

Objetivo Comparar os valores dos marcadores para capnografia volumétrica e espirometria e sua capacidade de classificar crianças e adolescentes com asma, fibrose cística (FC) e controles saudáveis. Métodos Foi realizado um estudo transversal que incluiu 103 …

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Design of Device to Monitor **Asthma** Severity Using Mainstream Technology while Administering Medication

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Artificial intelligence techniques in **asthma**: a systematic review and critical appraisal of the existing literature

KP Exarchos, M Beltsiou, CA Votti… - European Respiratory …, 2020 - Eur Respiratory Soc

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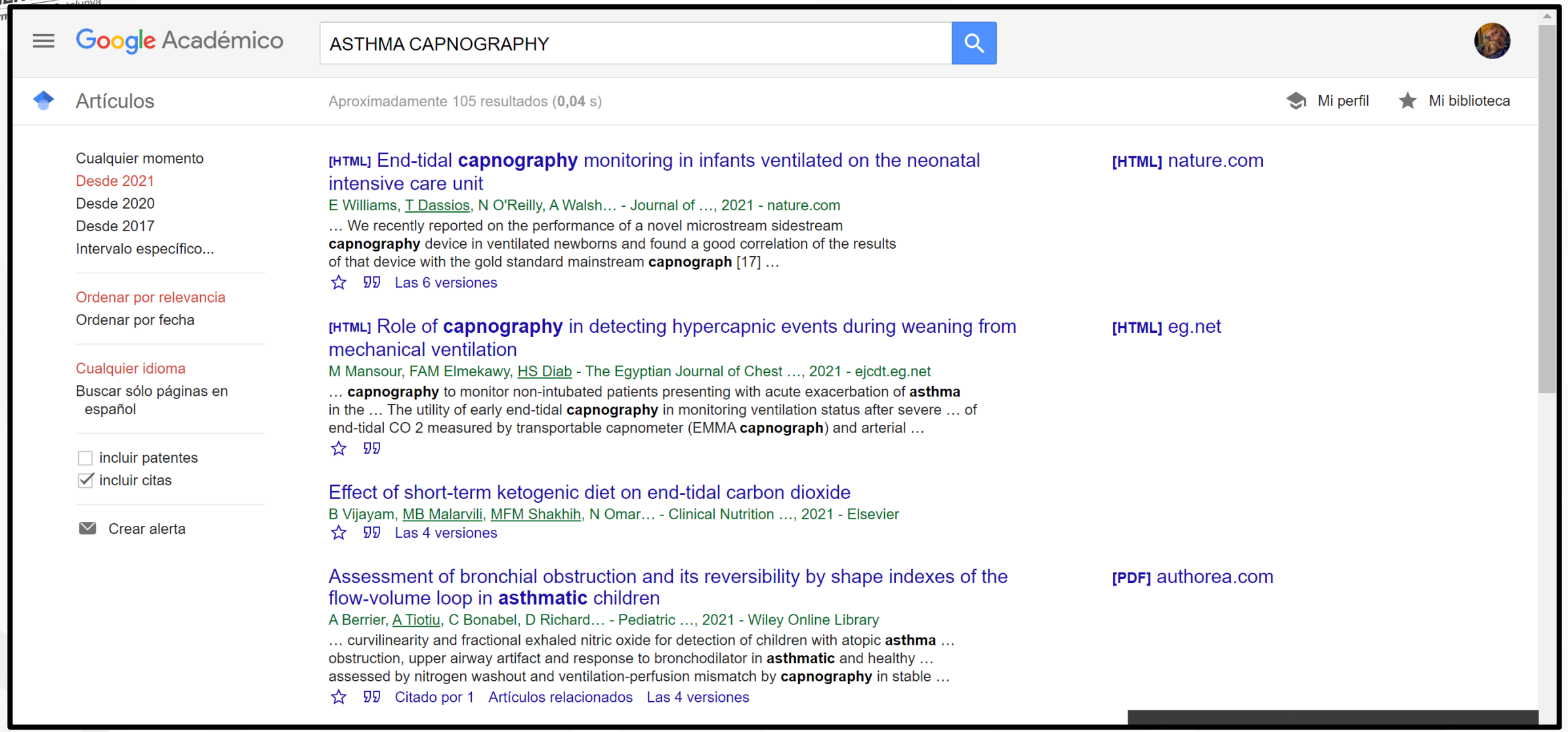
E Williams, T Dassios, A Greenough - Pediatric pulmonology, 2020 - Wiley Online Library

… The **Asthma** UK Centre for Allergic Mechanisms in **Asthma**, King's College London, London, UK … Continuous monitoring of carbon dioxide (CO 2) levels can be achieved by **capnography**. Our aims were to compare the performance of a sidestream **capnograph** with a low dead …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[HTML] End-tidal capnography monitoring in infants ventilated on the neonatal intensive care unit
E Williams, T Dassios, N O'Reilly, A Walsh… - Journal of …, 2021 - nature.com
… We recently reported on the performance of a novel microstream sidestream capnography device in ventilated newborns and found a good correlation of the results of that device with the gold standard mainstream capnograph [17] …
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M Mansour, FAM Elmekawy, HS Diab - The Egyptian Journal of Chest …, 2021 - ejcdt.eg.net
… capnography to monitor non-intubated patients presenting with acute exacerbation of asthma in the … The utility of early end-tidal capnography in monitoring ventilation status after severe … of end-tidal CO 2 measured by transportable capnometer (EMMA capnograph) and arterial …
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A Berrier, A Tiotiu, C Bonabel, D Richard… - Pediatric …, 2021 - Wiley Online Library
… curvilinearity and fractional exhaled nitric oxide for detection of children with atopic asthma … obstruction, upper airway artifact and response to bronchodilator in asthmatic and healthy … assessed by nitrogen washout and ventilation-perfusion mismatch by capnography in stable …
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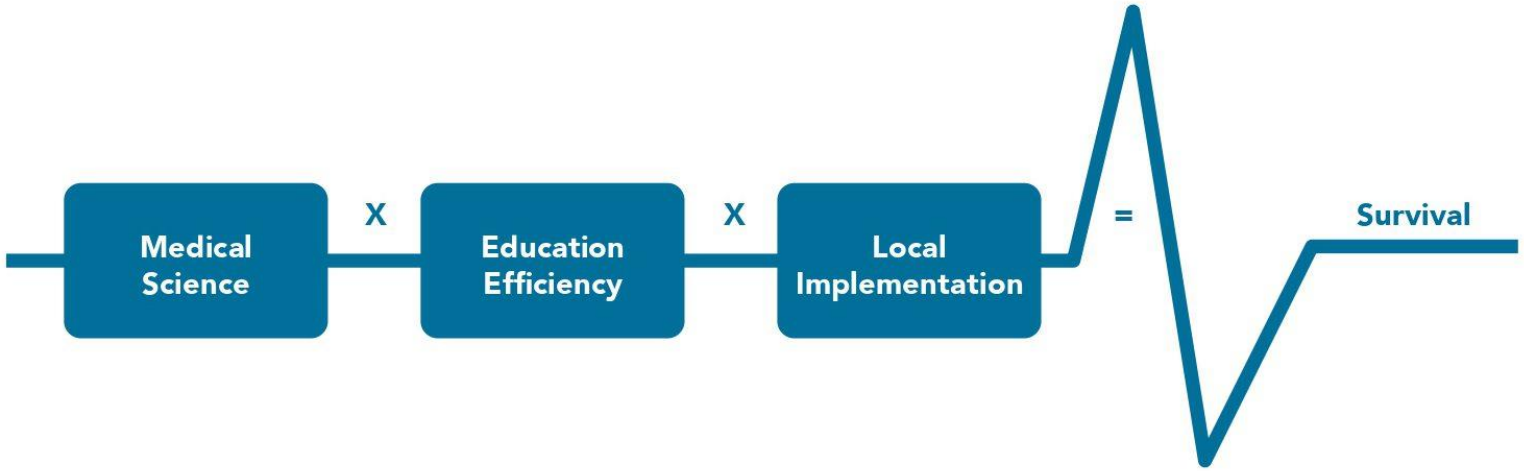
EDUCATION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Education Efficiency
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Local Implementation
=
Survival

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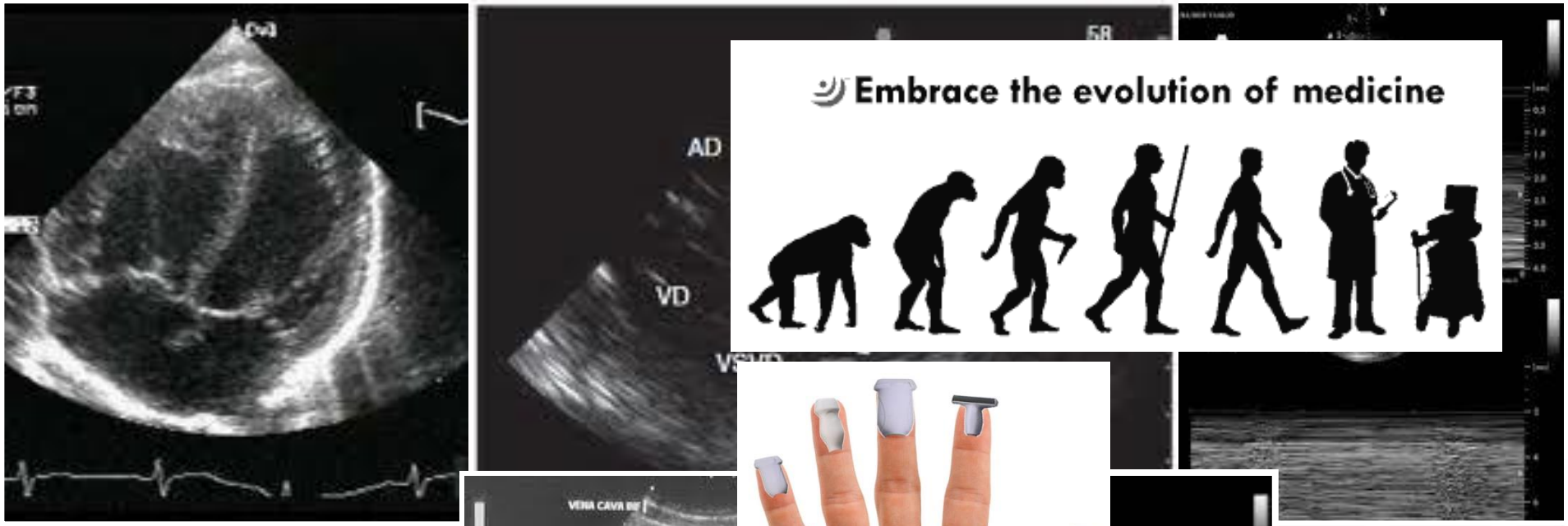

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