

Hypercoagulability and thrombosis in special ICU patient populations: How to manage critically ill patients...



Chair: Vera von Dossow

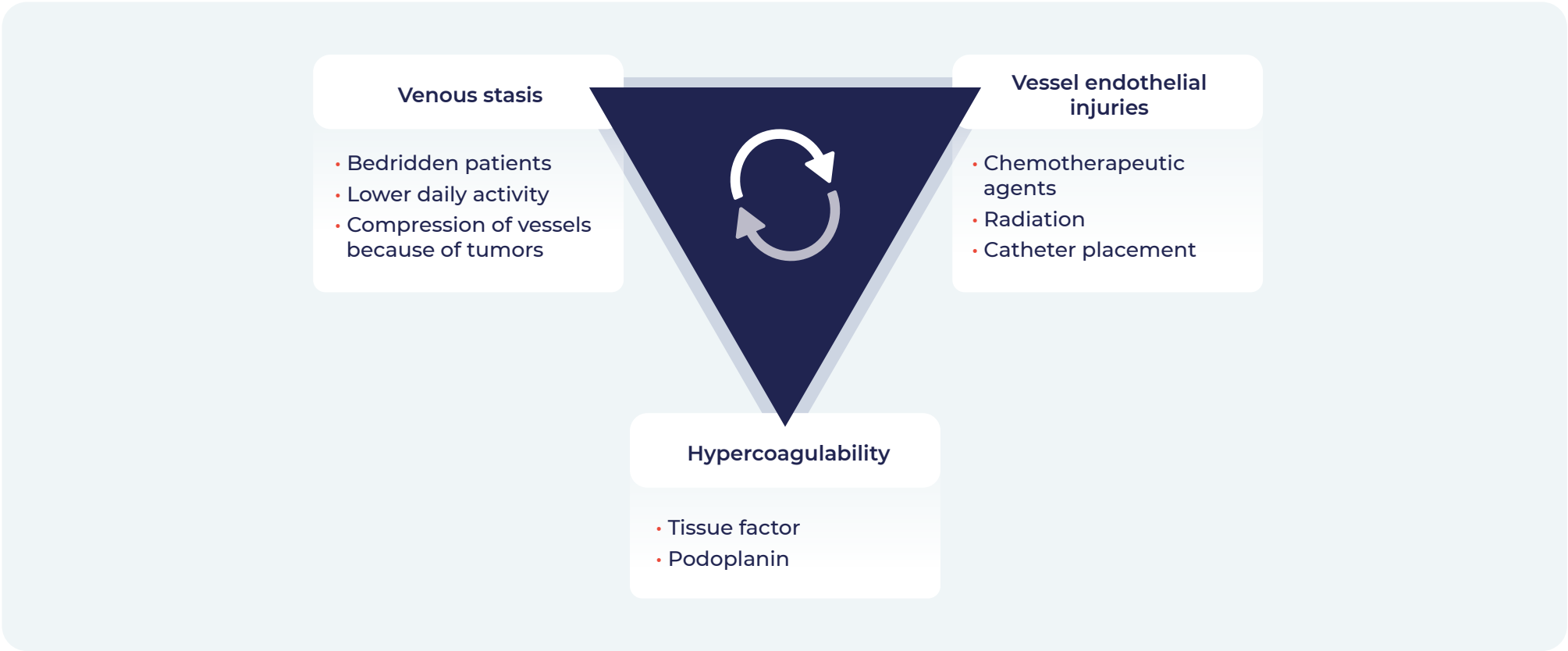
Sunday, May 26, 2024

1. ...WITH CANCERS IN BLEEDING-CRITICAL AREAS

Özlem Korkmaz Dilmen

In the last few years, several improvements have been made in the field of thrombosis associated to oncological diseases.

There are certain additional factors to the Virchow's triad contributing to oncological patients presenting an incidence of venous thromboembolism 4-7 times higher than the general population¹:



The types of neoplasms with a higher risk of thrombosis are the following²:



TREATMENT OF ESTABLISHED VENOUS THROMBOEMBOLISM IN ONCOLOGY³

Anticoagulant treatments decrease the risk of thrombosis, but they may increase the risk of bleeding.

First-line treatment

LMWH	DOAC	UHF
<ul style="list-style-type: none">• If CrCl ≥ 30 mL/min• Preferred choice vs. antivitamin K	<ul style="list-style-type: none">• If the risk of gastrointestinal or genitourinary bleeding is low• If CrCl ≥ 30 mL/min• If there are no strong drug interactions or reduced absorption	<ul style="list-style-type: none">• If LMWH and DOAC are contraindicated

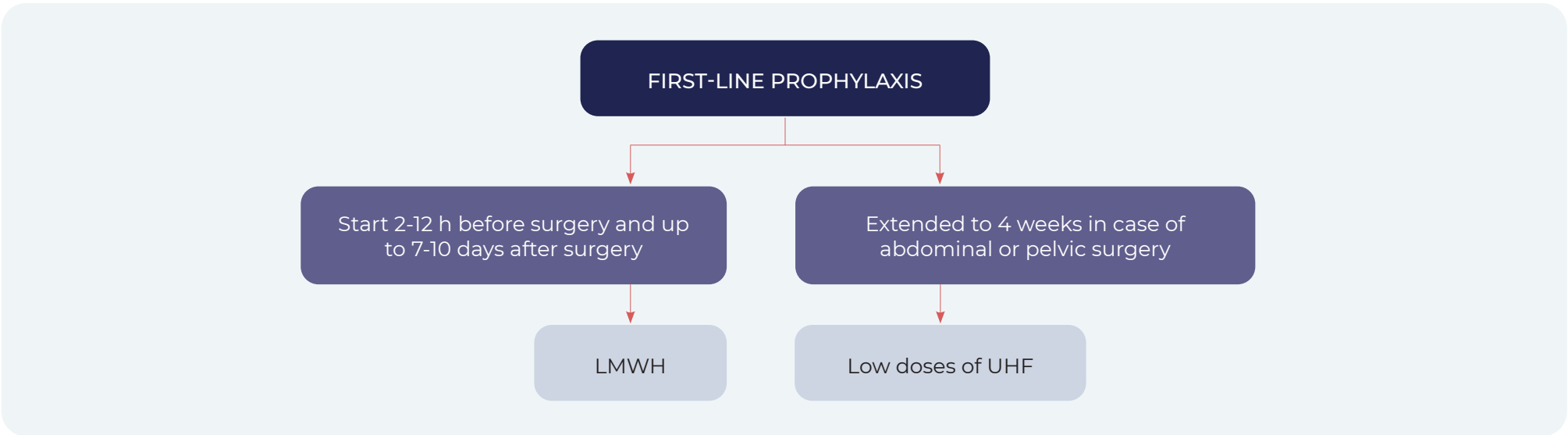
Filters in the inferior vena cava: treatment choice when anticoagulant are contraindicated or in cases of pulmonary embolism, when there is a relapse after an optimal anticoagulant treatment³.

In cases of thrombocytopenia < 50 x 10⁹, decision-making should be individualized and cautious.

CHOOSING THE BEST TREATMENT BY ASSESSING THE FOLLOWING PARAMETERS⁴:

- Risk of bleeding (kidney function, CHILD-PUGH, thrombocytopenia)
- Drug interactions
- Absorption (gastrectomy or intestinal resection, poor absorption)

PROPHYLAXIS OF POST-SURGERY VENOUS THROMBOEMBOLISM IN ONCOLOGY³



Currently, new strategies are required to tackle the following unmet needs:

- Reducing high rates of bleeding in patients with gastrointestinal or genitourinary neoplasms.
- Defining the best management of thrombocytopenia.
- Reducing the impact of kidney failure.
- Minimizing drug interactions.
- Optimizing the duration of the anticoagulant treatment.



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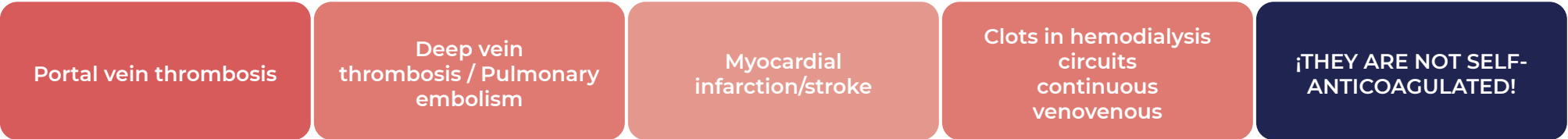
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2. ...WITH LIVER CIRRHOSIS

Dana Rodica Tomescu

THROMBOTIC EVENTS THAT MAY APPEAR IN CIRRHOTIC PATIENTS⁵:



Specifically, the risk of venous thromboembolism is two times higher in cirrhotic patients than in the general population^{6,7}. The severity of the liver disease and the unbalance in cirrhosis, even when acute, may be decisive⁵.

There are certain additional factors to the Virchow's triad contributing to the incidence of venous thromboembolism in cirrhotic patients:



The pathophysiologic process of the portal vein thrombosis and venous thromboembolism/pulmonary embolism is different in cirrhotic patients.

Portal vein thrombosis	Deep vein thrombosis / Pulmonary embolism
Low blood flow rate in the portal vein	Hypercoagulable state
Endothelial dysfunction	
Hypercoagulability or fibrosis?	
Because of these factors, the anticoagulant treatment may not be enough	

TREATMENT OF PORTAL VEIN THROMBOSIS

- Treating portal or splenic vein thrombosis with LMWHs as a first line as soon as possible.
 - It can be switched to antivitamin K.
 - It can be switched to a DOAC:
 - Severe liver dysfunction may affect pharmacokinetics.
 - Severe cirrhotic patients were excluded from RCTs.
 - Caution should be used, and further studies are required to determine which is best in this population.
 - Risk of bleeding similar to antivitamin K and higher rechanneling rate⁸.
 - Treatment and follow-up for 3-6 months.
- A transjugular intrahepatic portosystemic shunt (TIPS) can be performed if thrombosis progresses despite the anticoagulant treatment.

TREATMENT OF VENOUS THROMBOEMBOLISM

- In the treatment of deep vein thrombosis and pulmonary embolism, LMWHs, antivitamin K, and DOACs seen safe and effective to prevent relapse of major events, such as venous thromboembolism or ischemic stroke⁹.
- Thromboprophylaxis using LMWHs or DOACs in hospitalized patients (CHILD-PUGH A or B) has an acceptable safety profile.
- The risk of bleeding must be assessed on an individual basis and with caution at the start of the treatment. Other than that, it must be reconsidered in case of further clinical events.
- Thrombotic complications in critical patients should be treated and monitored in a personalized manner.

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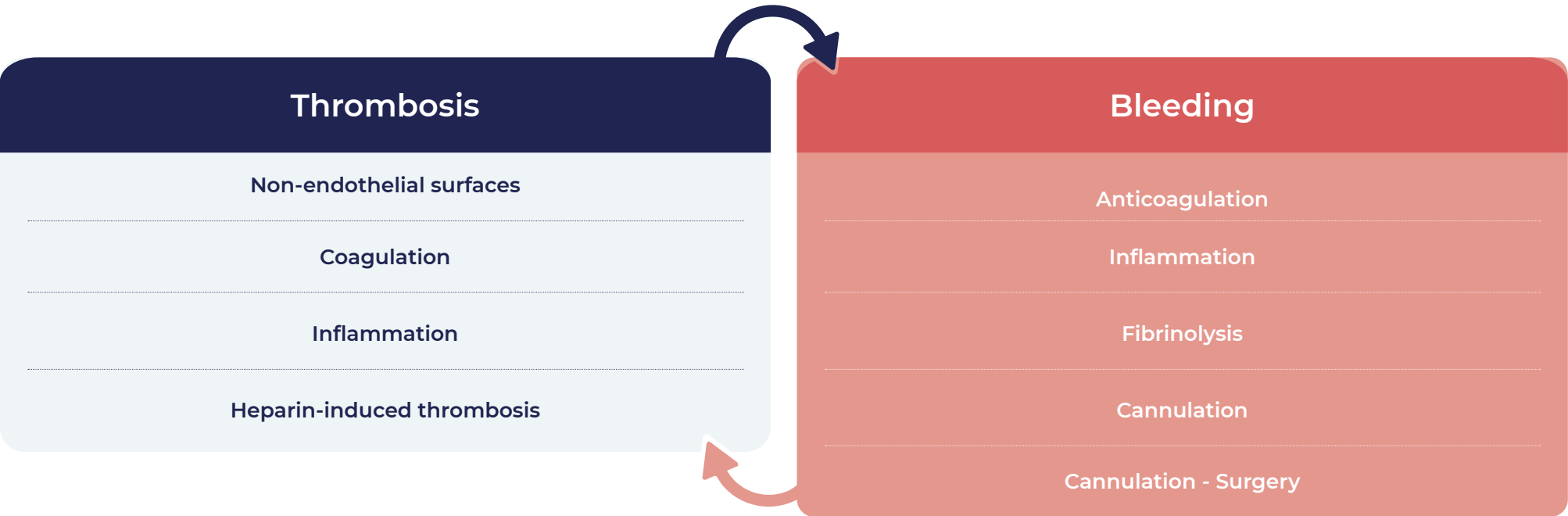
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3. ...ON EXTRACORPOREAL MEMBRANE OXYGENATION

Sascha Treskatsch (Berlin, Germany)

Patients with extracorporeal membrane oxygenation (ECMO) are the most complex ones, as well as patients in critical units. ECMO presents a number of associated problems that may trigger both a thrombotic state and hemorrhages.

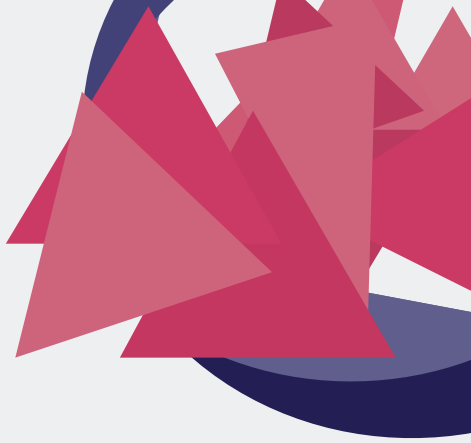


There are only two clinical practice guidelines that review anticoagulation during ECMO^{10,11}. These are the current recommendations:

- The use of UHF is recommended for anticoagulation during ECMO.
 - Pharmacokinetics present interpersonal variability.
 - Assessing anti-Xa is suggested to monitor anticoagulation with UHF with anti-Xa target values of 0.3 - 0.5 U/mL.
 - There is a risk of heparin-induced thrombosis in 0.2 - 5% of adult population.
 - One of the benefits is the existence of the specific antidote: protamine.
- In patients with actual or suspected heparin-induced thrombocytopenia, switching anticoagulation to direct thrombin inhibitors is recommended.
 - Its current use is off label.
 - Further evidence is still needed, but the switch seems safe^{12,13}.
 - Starting with 0.02 – 0.05 µg/kg/min of bivalirudin is suggested (aPTT 1.5 - 2 times above the normal value).
- Monitoring of the treatment is suggested using the activated partial thromboplastin time (aPTT), although there is yet no robust evidence to this regard¹⁴.
 - Using institutionalized protocols is recommended for dosing and monitoring.
 - Monitoring at the point of care allows to predict bleeding, but it does not improve clinical outcomes¹⁵.
- Antithrombin should be monitored in patients with thrombosis.
- ECMO without anticoagulation is not recommended.

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Perioperative fluids: which one, how much, how long?

Chair: Daniela Ionescu

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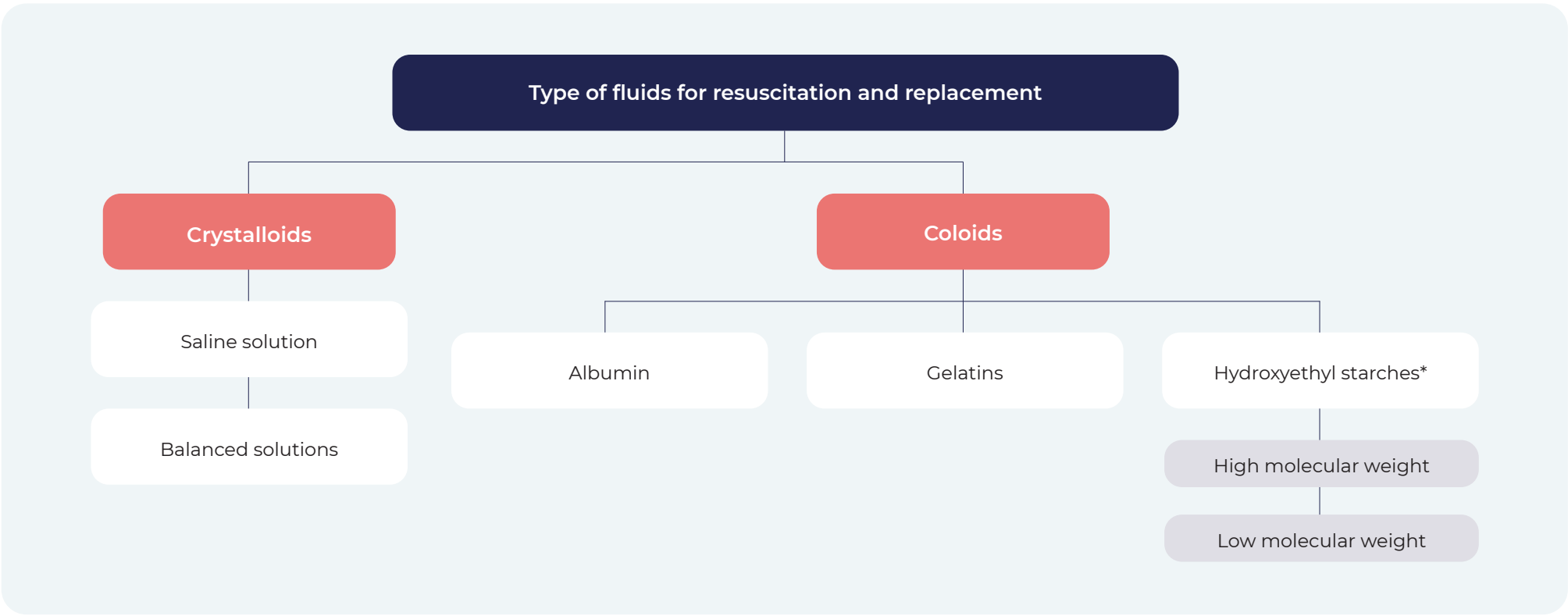
1. WHAT TO CHOOSE: CRYSTALLOIDS? COLLOIDS? ALBUMINS?

Michelle Chew

Indications for the use of intravenous fluids

Resuscitation	Replacement	Maintenance
Correction of large volume deficiencies	Correction of existing or newly emerged deficiencies	Meeting water, electrolytes, and energy requirements
Treatment of acute hypovolemia		

The optimal fluid for perioperative use should allow the maintenance of organic perfusion and homeostasis.



* Currently not available in Europe

BALANCED CRYSTALLOIDS

- Generally, they are the first choice.
- Lower chloride load, which can be relevant to prevent hyperchloremic acidosis and potential effects on the kidney function.
- In their perioperative use for fluid replacement, balanced crystalloids without calcium are not associated to lower mortality, but lower morbidity, than saline solution¹.
- They should be prioritized if large volumes of fluids must be administered.
- In certain profiles, for instance in neurocritical patients, saline solution is still the first choice.
- In critical patients:
 - ✓ No differences in terms of incidence of acute kidney damage, in mortality within 90 days, or in secondary outcomes²⁻⁴.
 - ✓ Reduction in major renal adverse effects within 30 days⁵.
 - ✓ A meta-analysis concluded that the effect on the mortality of patients with sepsis was consistent, with a 14% relative decrease and a 1% relative increase of the risk of death⁶.

HYDROXYETHYL STARCHES

- In abdominal surgery, a higher transfusion rate has been observed, yet with no differences in the incidence of kidney damage within 30 days, and similar rates in abdominal complications (non-robust evidence)⁷.
- In critical patients: a deleterious effect has been observed in starches, with a higher incidence of renal dysfunction⁸⁻¹⁰.

ALBUMIN

- This is the protein determining plasma oncotic pressure, and it accounts for 50% of plasma protein.
- A recent study has associated the use of albumin with a higher risk of renal damage, pulmonary complications, and mortality within 30 days in patients undergoing major surgery¹¹. However, a subsequent study did not observe differences in postoperative complications¹².
- In critical patients:
 - ✓ No differences in mortality within 28 days or in secondary outcomes¹³.
 - ✓ Potential damage in patients with traumatic brain injury¹³.
 - ✓ Reduction in mortality of patients with septic shock¹⁴.

In summary, the measures to consider are the following:

Avoiding chloride load, prioritizing balanced solutions

Avoiding hydroxyethyl starches

There is not enough evidence for the use of albumin



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2. HOW TO ASSESS FLUID RESPONSIVENESS IN THE OPERATING ROOM?

Sheila Nainan Myatra

Excessive administration of fluids in the perioperative setting is associated with an increase in the rate of complications, mortality, and duration of stay in the ICU. As for hypovolemia, when not corrected, it can impact tissue oxygenation, and it can cause organ dysfunction and higher mortality.

Therefore, it is key to know:

- How much must be administered.
- Which patients will respond to fluid therapy.

The fluid response is the state in which fluid administration brings about an improved ejection volume, and subsequently, an improved cardiac output.

Currently there is no evidence backing the use of central venous pressure to guide fluid therapy, and this practice should be avoided¹⁵.

The determination of the fluid response is associated with a decrease in mortality, and the duration of stay in the ICU and mechanical ventilation¹⁶.

METHODS TO QUANTIFY THE FLUID RESPONSE “FLUID CHALLENGE”:

- **Respiratory variations of systolic volume or related:**
 - Pulse pressure variation (PPV), stroke volume variation (SVV), systolic pressure variation (SPV)¹⁷, although they present certain limitations:

False positives	False negatives
Irregular beats	Extreme bradycardia or high-frequency ventilation
High abdominal pressure	Mechanical ventilation with low tidal volume
Spontaneous respiration	Open thorax
	Spontaneous respiration

- **Echocardiographic variables** (transthoracic or transesophageal echocardiography)

Variations in the diameter of the superior vena cava (SVC)

Variations in the diameter of the inferior vena cava (IVC)

Variations in the aortic root flow rate

- Transesophageal echocardiography presents certain limitations:
 - Sensitive to the patient’s movement, so it is more often used in the OR than the ICU.
 - The aortic diameter depends on the transmural aortic pressure.
- **Pulse oximetry**
 - **Tidal volume challenge (TVC):** Monitoring of PPV and SVV change with the transient increase of tidal volume from 6 to 8 ml/kg¹⁸.
 - **End-expiratory occlusion test (EEOT)**
 - Responders can be predicted if an increase in cardiac output > 5% is observed^{19,20}.
 - **Pulmonary recruitment maneuver**
 - It requires caution due the potential hypotension risk.
 - A decrease of 30% in systolic volume during the maneuver predicts fluid response with an 88% sensitivity and a 92% specificity²¹.

FLUID THERAPY IN THE OR

- If the clinical situation is clearly hypovolemic, a swift administration of fluids will be more effective than determining the fluid response.
- It is better to use dynamic rather than static parameters to predict fluid response during invasive ventilation.
- The existence of fluid response does not mean that fluid should be administered *per se*. There can be other variables determining that fluids may pose a risk to the patient.
- Dynamic determination of fluid response in goal-directed therapy reduces mortality, stay in the ICU, and duration of mechanical ventilation.
- The integration of several dynamic indexes with the clinical assessment is essential.

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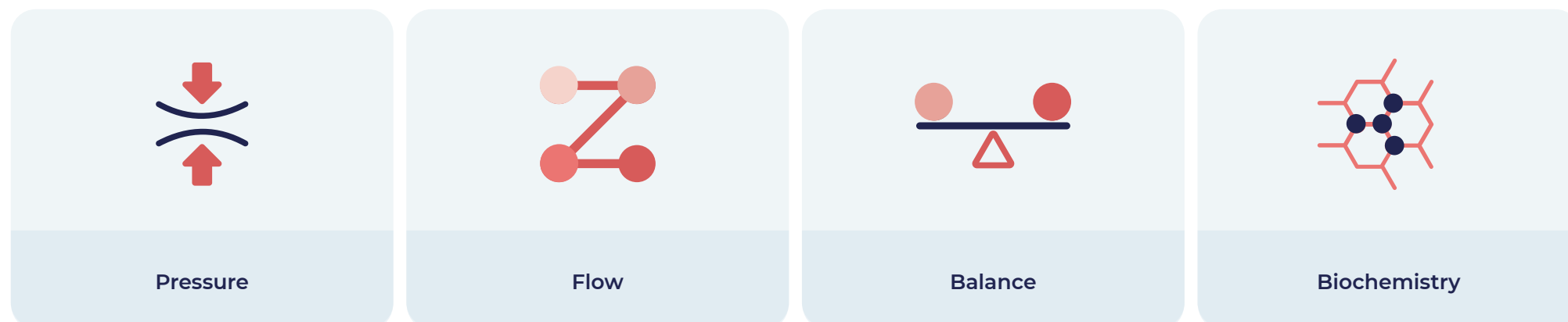
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3. (GOAL-DIRECTED) FLUID ADMINISTRATION DURING AND AFTER SURGERY

Brigitte Brandstrup

Goal-directed fluid therapy comprises several approaches:



The GAS-ART-trial compared pressure- and flow-guided fluid therapy in patients undergoing emergency gastrointestinal surgery (bowel obstruction or gastrointestinal perforation)^{22,23}.

- In the flow-guided group, a lower volume of fluids was administered during surgery, but not afterwards.
It is relevant to consider fluid therapy in the postoperative setting, and not exclusively during surgery.
- Differences were observed in the survival of patients with obstruction and perforation.
It is relevant not to consider all patients undergoing abdominal surgery as similar patients, to compare trials including different profiles between them, and to be more specific when presenting the features of patients in trials.
- Flow-directed fluid therapy to an almost maximal systolic volume does not improve the outcome after surgery, and it can extend the time of hospital stay.
Fluid therapy should be guided by a combination of balance (maximal strategy of 2 L of fluid in a perioperative setting), pressure, and biochemical parameters.

It has been observed that different types of complications emerging from an emergency gastrointestinal surgery are associated with different fluid balance numbers²⁴:

- Lowest risk of cardiopulmonary complications if balance = 0 - 2 L
- Lowest risk of renal complications if balance = 1.5 - 3.5 L
- Highest risk of general and cardiopulmonary complications if balance > 2.5 L

A balance above 2L is associated to a higher incidence of complications.

IN THE POSTOPERATIVE SETTING:

- The content of electrolytes and pH of different gastrointestinal fluids is diverse.
Replacement should be carried out with a similar amount of fluids to what the patient lost, but also with a similar quality.
- Replacing losses, both normal and pathological.
- Maintaining a near-zero fluid balance.
- Examining patients with low blood pressure or low diuresis: identifying and treating the cause.
- Initiating nutrition as soon as possible. If the patient is not able to eat, initiating enteral or parenteral nutrition as soon as possible.

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Perioperative risk in patients with cirrhosis



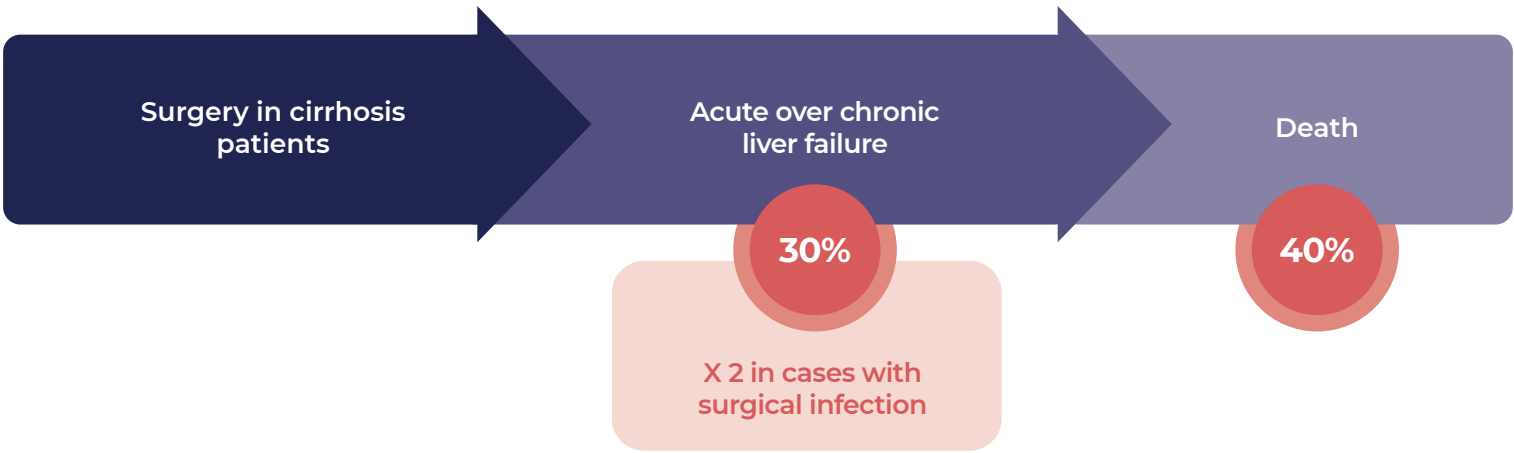
Chair: Dana Rodica Tomescu

Sunday, May 26, 2024

1. PREOPERATIVE ASSESSMENT OF CIRRHOTIC PATIENTS - TIME TO DECIDE IF WE CAN PROCEED TO SURGERY

Emmanuel Weiss

Postoperative risk in cirrhosis patients is higher than in the general population^{1,2}:



Thus, surgery should be avoided in cirrhosis patients, responding to the following factors³:

- Higher mortality in cirrhosis patients undergoing major abdominal surgery vs. other surgeries.
- Higher mortality in emergency surgeries.

MELD, which is still the most frequently used scale, is useful for the stratification of surgical risk in cirrhosis patients⁴

MELD < 8 ➡ Mortality within 30 days = 6%
MELD > 20 ➡ Mortality within 30 days = 50%
but imperfect accuracy for MELD > 15

However, there are more accurate specific scales⁴⁻⁶:

Mayo Risk Score

Anesthesia-specific assessment

Liver function assessment

Etiology of cirrhosis

Overestimation of mortality risk compared to VOCAL-Penn

VOCAL-Penn

Anesthesia-specific assessment

Liver function assessment

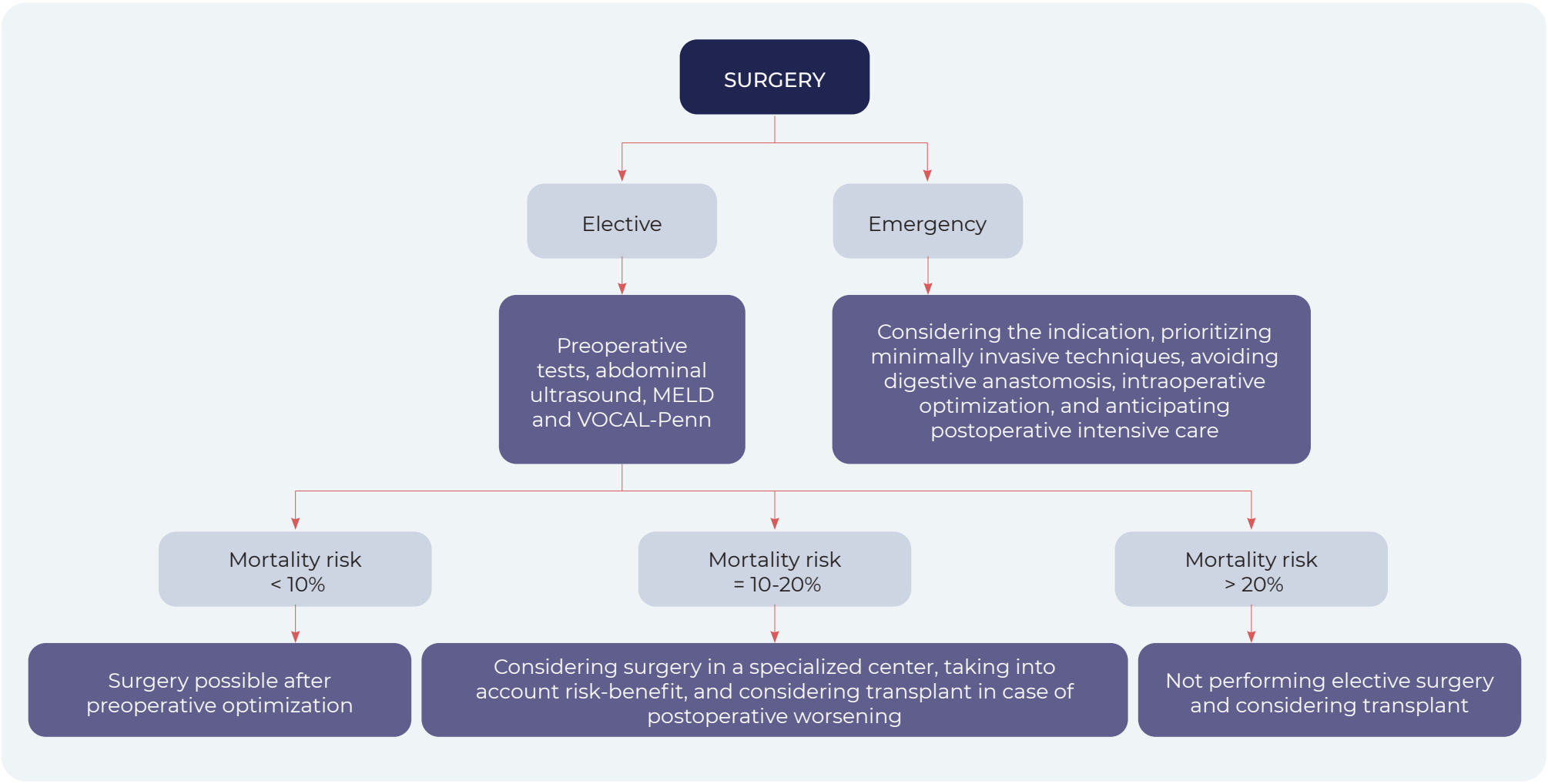
Etiology of cirrhosis

Context (type of surgery and whether emergency)

Particularly accurate in patients with MELD > 15

Risk prevention in surgical patients with cirrhosis requires an **individualized stratification** of risk (of acute over chronic liver failure and mortality). Furthermore, not only the severity of cirrhosis, but also the **context** (type of surgery, elective vs. emergency) have to be assessed.

Management algorithm based on estimated risk:



Moreover, portal hypertension-related risk must be determined using the hepatic venous pressure gradient (HVPG)⁷.

Low risk: HVPG = 10-15 mmHg
Medium risk: HVPG = 16-20 mmHg
High risk: HVPG > 20 mmHg

In this regard, the preoperative transjugular intrahepatic portosystemic shunt (TIPS) may be associated with a decrease in postoperative mortality in selected patients⁸, but further studies are required to determine its impact on the improvement of postoperative results.

Perioperative risk in patients with cirrhosis

Chair: Dana Rodica Tomescu

Sunday, May 26, 2024

2. MONITORING AND BLOOD TESTS TO REDUCE POST-OPERATIVE COMPLICATIONS IN CIRRHOTIC PATIENTS UNDERGOING SURGERY

Annabel Blasi

Perioperative mortality is 2-10 times higher in patients with cirrhosis:

- Child A or MELD < 10: Similar to that of patients without cirrhosis.
- Child B or MELD > 15: Higher than that of patients without cirrhosis.
- Emergency surgery: postoperative mortality 10 times higher.

Therefore, it is important to intervene when patients are well compensated, and thus prevent potential emergency surgeries.

MONITORING OF CIRRHOTIC PATIENTS UNDERGOING SURGERY:

SODIUM

- Hyponatremia is associated with longer hospital stays and mechanical ventilation.
- Sodium levels < 130 meq/L are associated to neurological complications.

LACTATE

- Lactate levels > 30-37 mg/dL are associated with a higher mortality in patients subject to liver resection⁹.
- Lactate levels < 29 mg/dL can decrease postoperative infection risk.
- It is unknown whether lactate is a simple marker for poor perfusion or if it can be intervened and treated⁹.

HEMOGLOBIN

- 90% of patients with cirrhosis suffered from anemia.
- Baseline hemoglobin levels are the main predictor of preoperative transfusion.
- Preoperative anemia is associated with a higher mortality risk within 90 days of the transplant, acute renal failure, mechanical ventilation, and prolonged stay in the ICU.

HEMOSTASIS

- Prothrombin time (PT)/ activated partial thromboplastin time (aPTT) do not reflect the hemostatic capacity of cirrhotic patients.
- The platelet count provides limited information.
- Viscoelastic tests allow to assess hemostasis, but not to predict of the risk of bleeding. They also reduce the use of blood products, but not mortality.

FIBRINOGEN

- Levels < 1 g/dl are associated with bleeding (cause or consequence?)^{5,10}.
- The prophylactic administration of fibrinogen does not reduce the need to administer other blood products¹¹.

SCALES

- The VOCAL-Penn scale (<http://www.vocalpennscore.com>) can be used to assess the risk.

HEPATIC VENOUS PRESSURE GRADIENT (HVPG)

- It predicts postoperative mortality risk in patients undergoing elective extrahepatic surgery⁷.
- There are other non-invasive tests for when HVPG is not available:
 - Hepatic elastography
 - Spleen elastography
 - Serum markers such as the von Willebrand factor or the platelet count (with or without the spleen size).

Perioperative risk in patients with cirrhosis



Chair: Dana Rodica Tomescu

Sunday, May 26, 2024

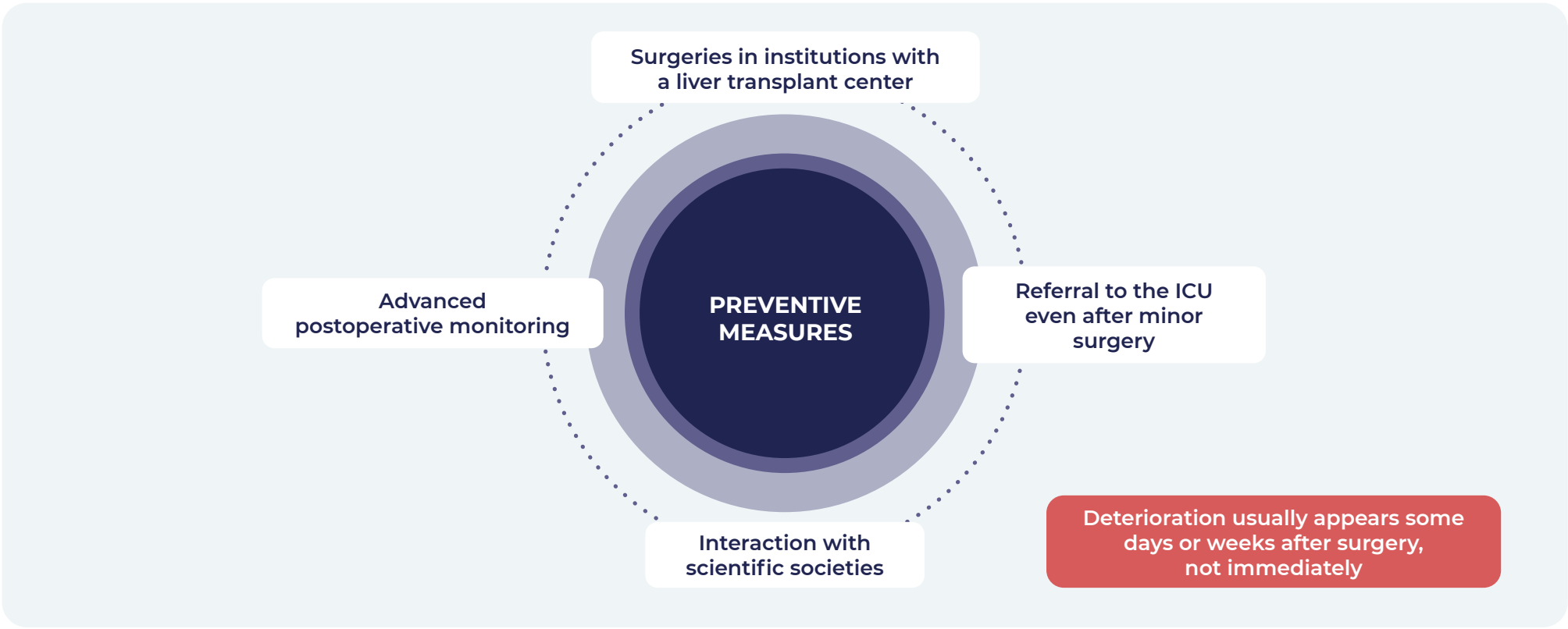
3. ADVANCED POSTOPERATIVE MONITORING IN CIRRHOTIC PATIENTS: IS ENHANCED RECOVERY AFTER SURGERY (ERAS) THE SOLUTION?

Dmitri Bezinover

Portal hypertension is the single most relevant postoperative mortality risk factor in cirrhotic patients undergoing surgery:

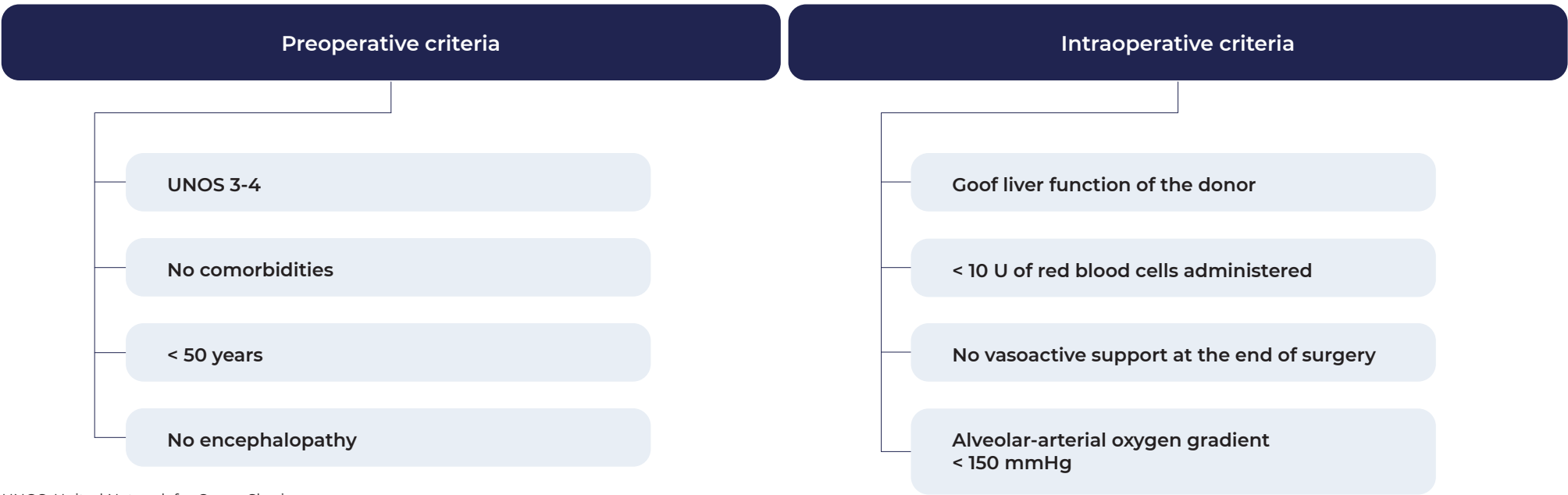
- Deep hemodynamic instability
- Endothelial dysfunction with hypercoagulability
- Hyponatremia
- Ascites
- Hepatic encephalopathy
- Other

Surgeries can unbalance cirrhotic patients who were stable.



A MELD score ≤ 11 is considered acceptable to proceed with surgery. However, in the case of cardiac surgery, the mortality risk is high, even in compensated patients with a low MELD¹².

The first ERAS protocol in liver transplant patients was published in 1990. Later, it was observed that extubation in selected patients is safe and cost-effective¹³:

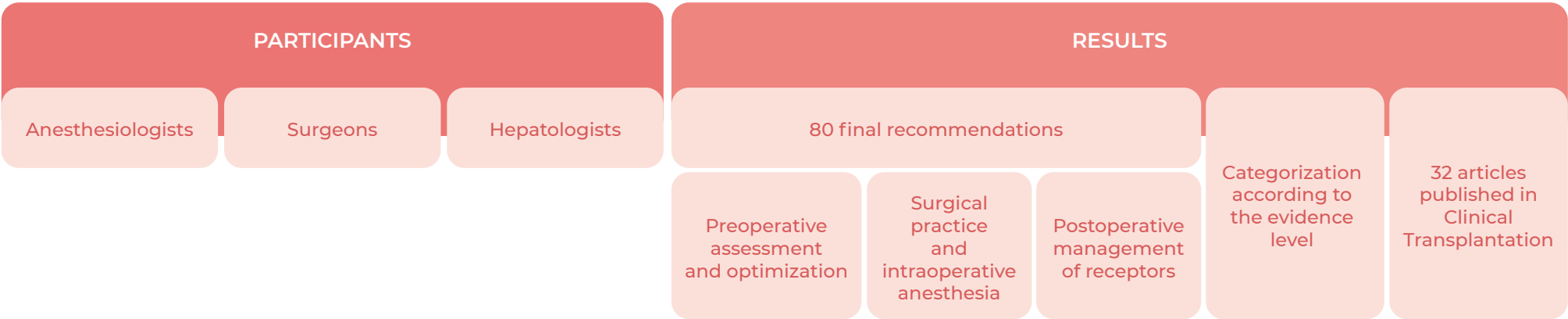


UNOS, United Network for Organ Sharing

ERAS has proved a positive effect in the following parameters¹⁴:

- Time until discharge from ICU
- Time until hospital discharge
- Number of platelet transfusions, fresh frozen plasma, and red blood cells
- Time until discontinuation of insulin infusion

In 2023, a consensus document was published on ERAS with liver transplant, with the participation of anesthesia, surgery, and hepatology. 80 final recommendations were drafted, categorized according to the evidence level, ranging from preoperative assessment and optimization to surgical practice and anesthesia, up to postoperative management.



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Traumatic Brain Injury - What's new and where do the guidelines lead us?

Chair: Özlem Korkmaz Dilmen

Sunday, May 26, 2024

1. TREATMENT OF TRAUMATIC BRAIN INJURY PATIENTS ACCORDING TO THE GUIDELINES - WHERE DO WE STAND?

Özlem Korkmaz Dilmen

The main management goals in severe traumatic brain injury cases are:

- 1. Reducing intracranial pressure
- 2. Maintaining an optimal perfusion pressure.

MONITORING

- Monitoring intracranial pressure is recommended to reduce mortality caused by traumatic brain injury (at the hospital and 2 weeks after the trauma)¹.
 - Intraventricular catheters are the first choice: they provide information on pressure but also on *intracranial compliance*¹.
- Advanced monitoring is recommended, since it lowers mortality and improves outcomes within 3-6 months after the trauma¹.
 - A cerebral oxygen tissue pressure (P_{tO₂}) < 15 mgHg is associated with cerebral ischemia and worse neurological outcomes. If persistent, it is also associated with a higher mortality.
BONANZA and BOOST3 trials will determine whether using P_{tO₂} is associated with improved outcomes.

HYPEROSMOLAR THERAPY

- This a rescue therapy, only administered if intracranial pressure is high.
- Mannitol has proven to be effective to control intracranial pressure, but it is important to avoid low blood pressure¹.
- Administering mannitol by continuous infusion is not recommended².

DRAINAGE OF CEREBROSPINAL FLUID

- Continuous drainage is recommended over intermittent¹.
- Lumbar drainage is not recommended².

VENTILATION

- Hyperventilation is recommended exclusively as a temporary measure to reduce intracranial pressure¹.
- Prolonged prophylactic hyperventilation is not recommended¹.
- Hyperventilation must be avoided for 24 hours within trauma¹.

ANESTHESIA, ANALGESIA, AND SEDATION

- Barbiturates are not recommended as a prophylactic measure for intracranial hypertension, and they must be used as a last resort in cases refractory to the medical or surgical treatment¹.
- Corticosteroids are not recommended^{1,2}.

PROPHYLAXIS OF DEEP VEIN THROMBOSIS

- Heparins are recommended in combination with mechanical prophylaxis¹.

PROPHYLAXIS OF CONVULSIONS

- Levetiracetam is the first-line treatment, and phenytoin is the second-line treatment if the former is contraindicated.

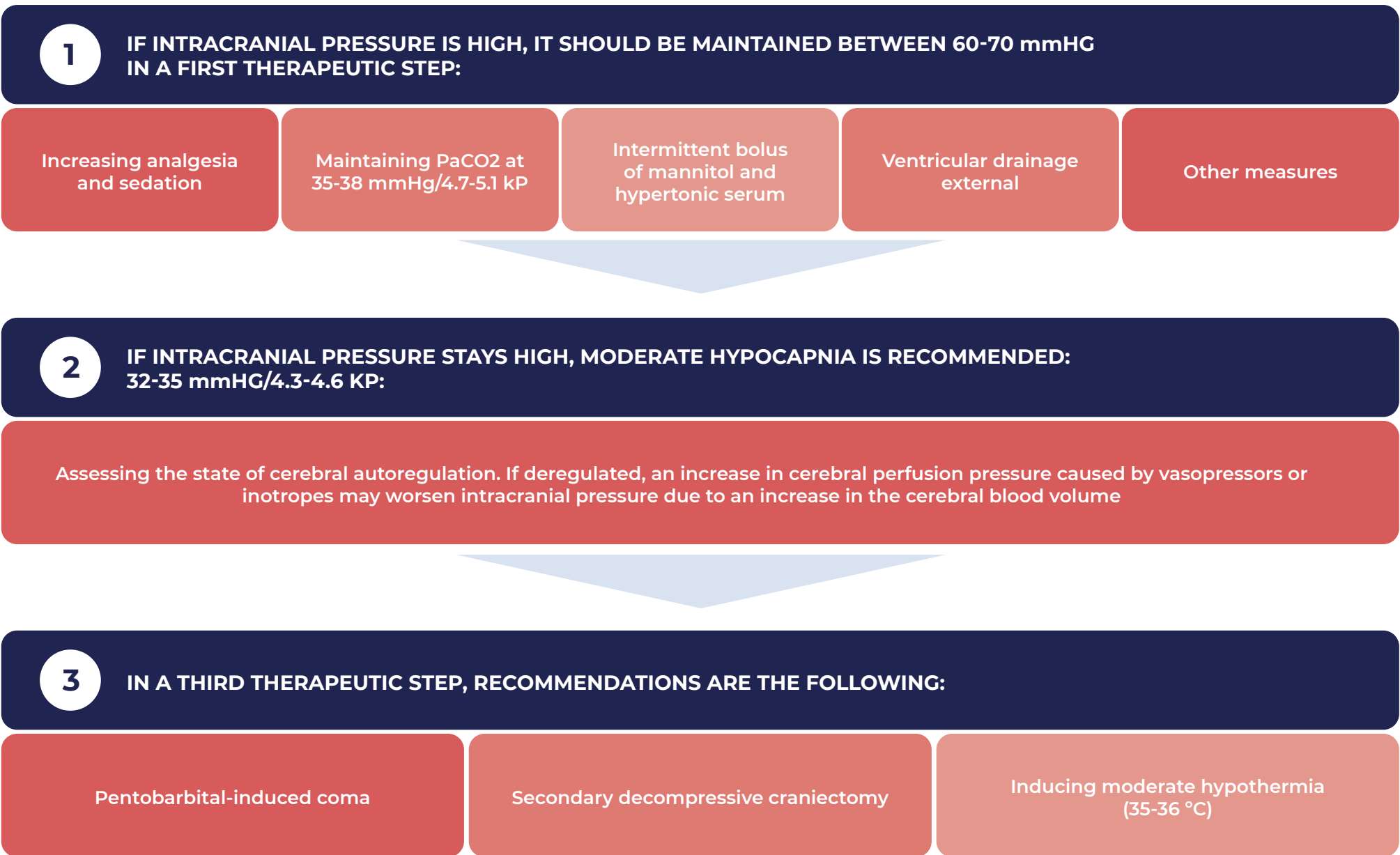
DECOMPRESSIVE CRANIECTOMY

- It is associated with a decrease in intracranial pressure and a shorter ICU stay, but also with a higher incidence of non-favorable neurological outcomes than the standard treatment³. Along the same line, another trial correlated it to a lower mortality, but higher disability rates⁴.
- It is recommended in refractory late cases of intracranial pressure increase¹.

THERAPEUTIC HYPOTHERMIA

- It is not recommended as a routine measure with temperatures below 35 °C².

The Seattle International Severe TBI Consensus Conference made a number of recommendations on the therapeutic approach of traumatic brain injury in 2019, in the form of a therapeutic algorithm²:



Traumatic Brain Injury - What's new and where do the guidelines lead us?

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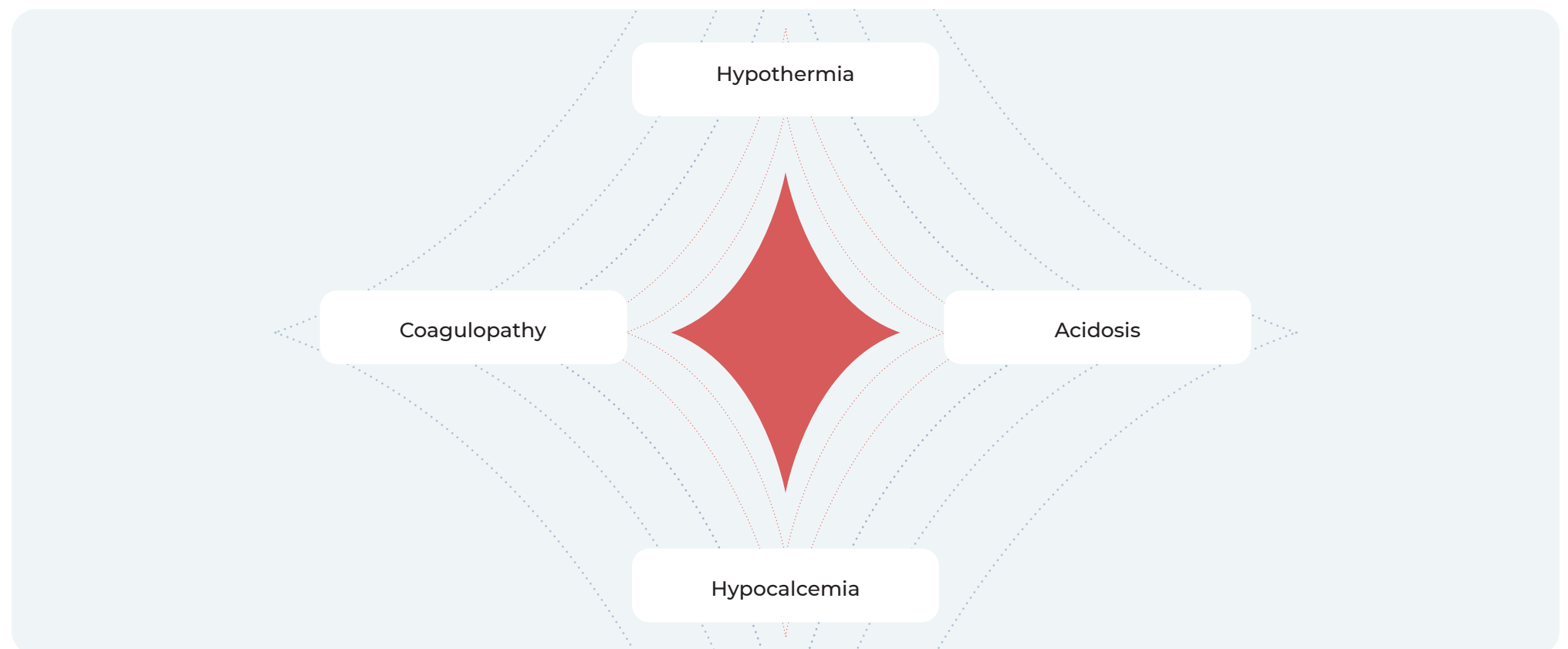
Sunday, May 26, 2024

2. MANAGING BLOOD CALCIUM LEVELS IN TRAUMATIC BRAIN INJURY PATIENTS

Aeyal Raz

Ca^{2+} is a critical cofactor for bleeding control. In fact, hypocalcemia is correlated to worse outcomes⁵⁻⁸.

Hypocalcemia is part of the so-called lethal diamond:



However, Ca^{2+} may increase brain cell damage after traumatic brain injury and may lead to secondary damage⁹.

- Secondary damage prevention is recommended, by administering Ca^{2+} channel inhibitors.

It was observed in a retrospective cohort study that three quarters of patients admitted to the ICU due to traumatic brain injury presented hypocalcemia¹⁰.

- Hypocalcemia was independently associated to a good neurological state upon discharge.
- Between patients with Glasgow Coma Score > 8 and those with bilateral reactive pupils (less severe), the rate of patients in a good neurological state upon discharge was significantly higher in hypocalcemic patients than in patients with normal Ca^{2+} levels.

Currently, optimal Ca^{2+} levels for traumatic brain injury patients are not known. Therefore, caution must be exercised when approaching hypocalcemia in these patients.

Prospective trials are required (if possible randomized) to determine optimal Ca^{2+} levels in patients with traumatic brain injury.



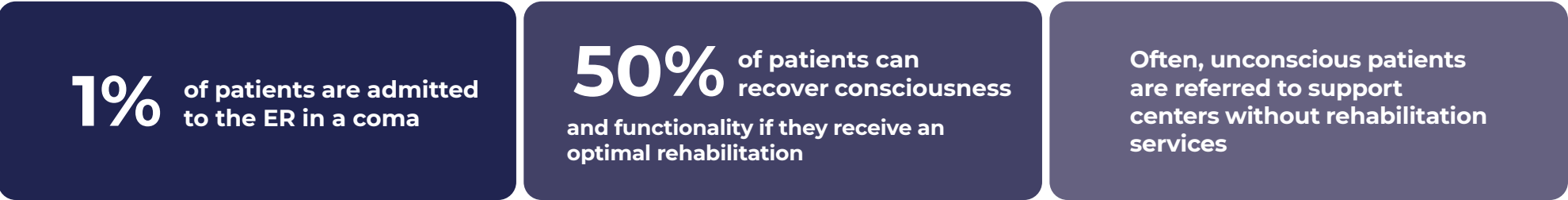
Traumatic Brain Injury - What's new and where do the guidelines lead us?

Chair: Özlem Korkmaz Dilmen

Sunday, May 26, 2024

3. PERSONALIZED APPROACH TO REHABILITATION FOLLOWING TRAUMATIC BRAIN INJURY

Dana Baron Shahaf



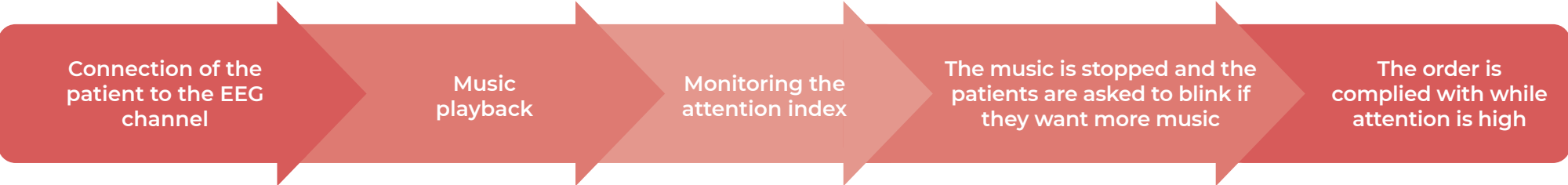
A great deal of patients considered unconscious may have a normal brain activity pattern in response to stimuli.

Magnetic resonance and electroencephalogram are not available at the bedside, so some **tool to assess the state of consciousness** of patients is required:

ELECTROENCEPHALOGRAM OF A CHANNEL

- Attention markers have previously been validated in patients with stroke, delirium due to encephalopathy, effective anesthesia, attention deficit disorder, anxiety, and during effective rehabilitation.
- It allows to identify attention in patients with an induced unconsciousness state.

The **EyeCon** system is based on the EEG/EMG for the rehabilitation of communication in unconscious critical patients. It comprises an automated protocol following the same process once and over again.



Benefits of the EyeCon system:

- ✓ Patient attention can be monitored, which is variable depending on the patients being admitted.
- ✓ A feedback/response is elicited from the patient (attention markers and blinking).

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