

Sirkulasjon – praktiske øvelser

Akuttukene 3D
18.04.2023

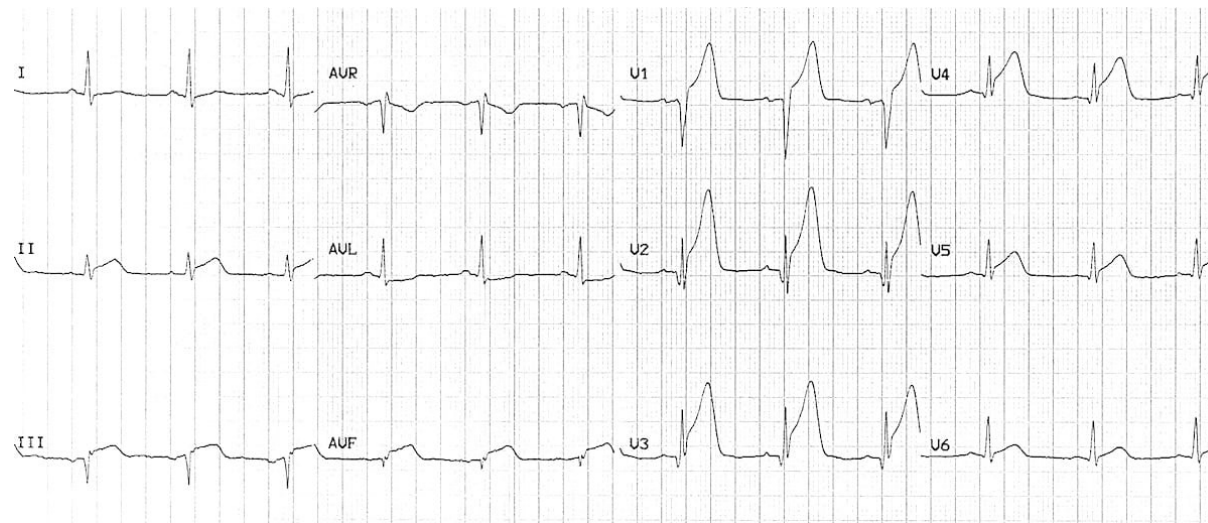
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Vi jobber i oksygentransportbransjen!



Kasuistikk 1

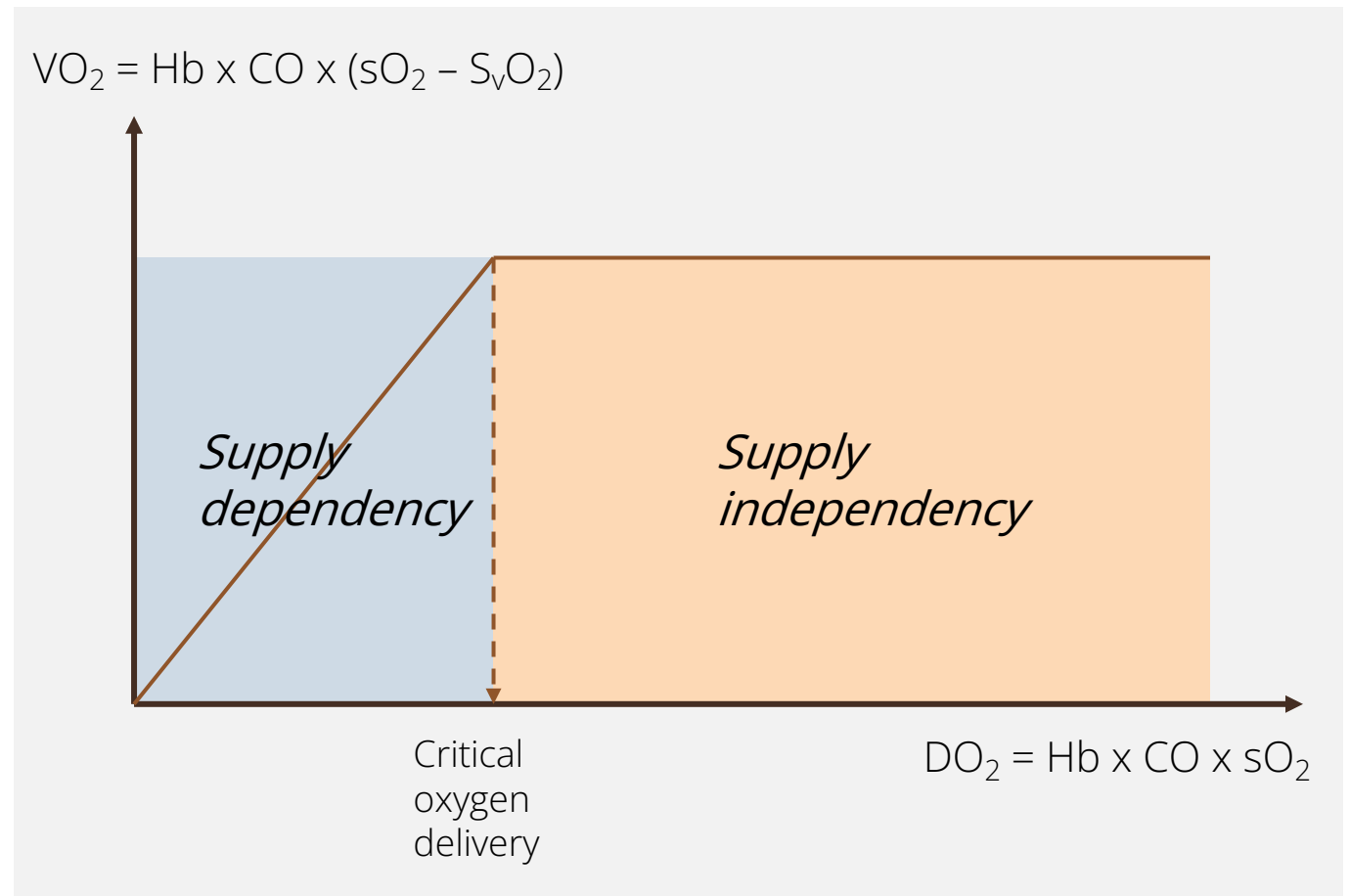
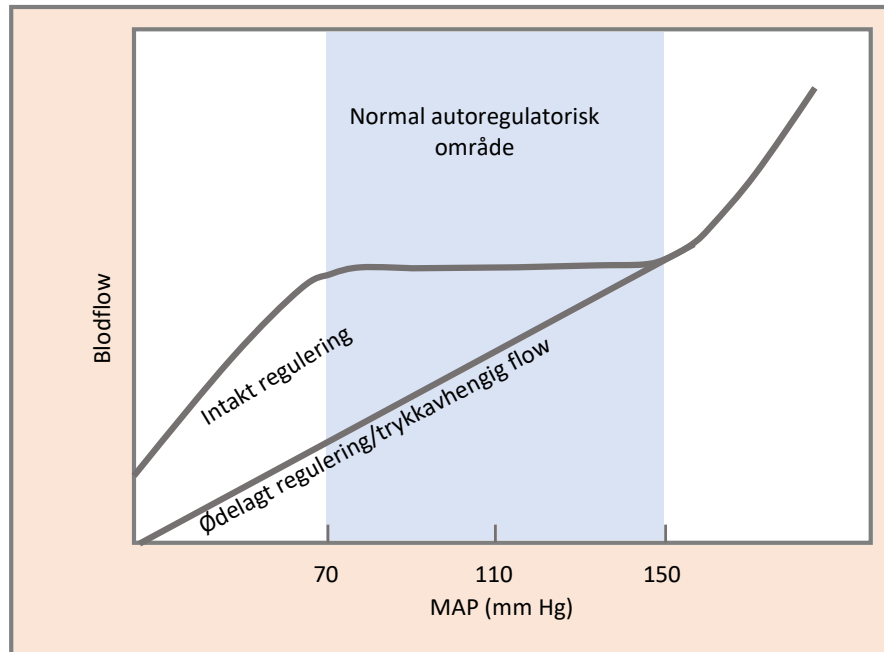
- 75 år gammel kvinne, tidligere røyker, hypertensjon og PCI. Nå brystsmerter.
- Ambulanse og DU som legevaktslege kommer til



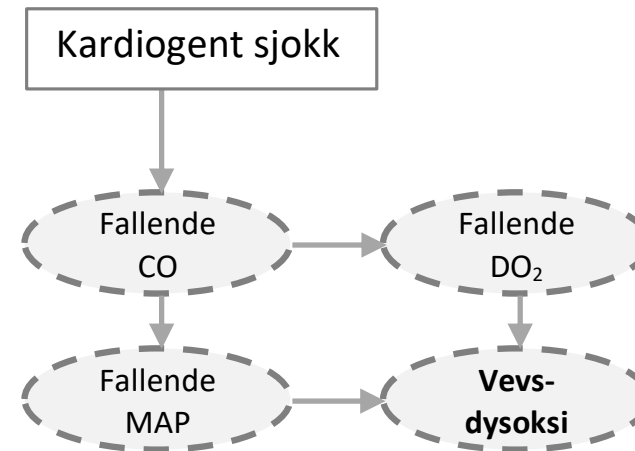
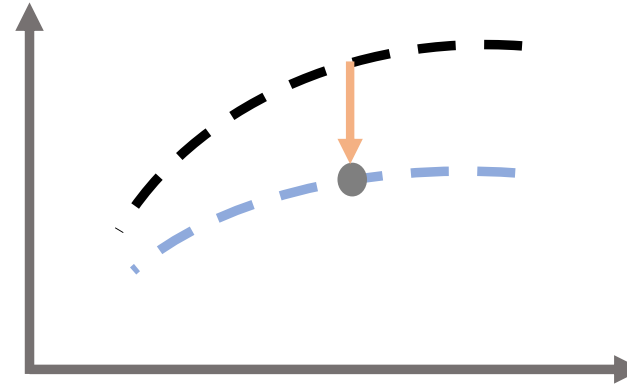
- Hva er dette?

- STEMI (FVI)
- MONA: morfin, oksygen, nitroglycerin, ASA
- Men først observasjoner
 - Smertepåvirket, kvalm, redd
- ... og vital-variabler
 - sO₂ 94%, BT 100/50, HR 100, RR 20
- Hva er din situasjonsforståelse?
- Hva gjør du nå?
 - Behandling, transport (hvor raskt og hvordan)?

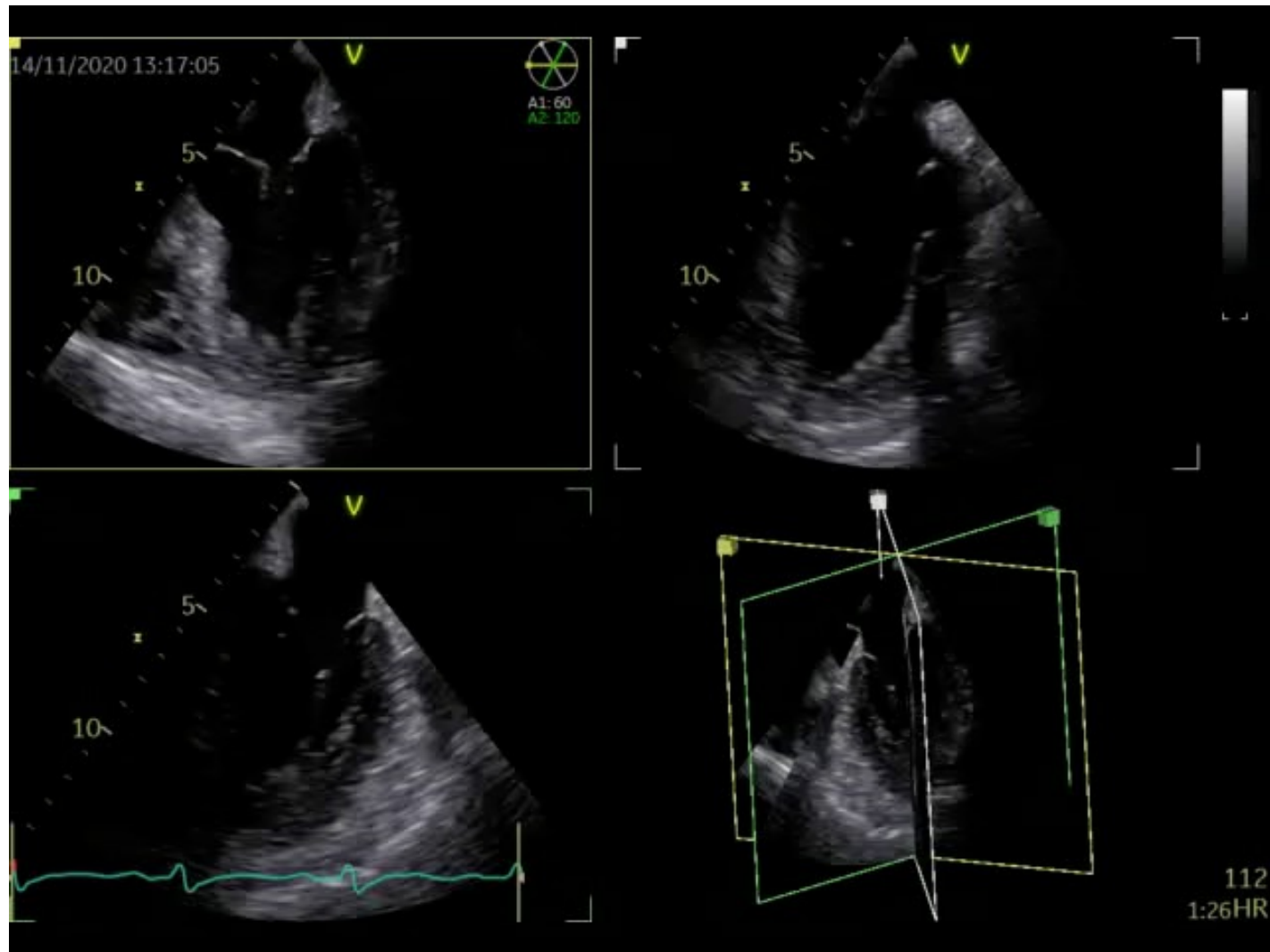
- Truet DO_2 ?
- Truet perfusjon?



- Hvordan sikre DO_2 ?
- Hvordan sikre perfusjonstrykk?
- Hvordan redde hjertet?



- Hvor mye væske og hvor fort?
 - Evig debatt...
 - Tradisjonelt: forsiktighet pga forverret svikt og lungeødem
 - Moderne: tøffere..? 10 ml/kg... 30 ml/kg..??
- Praktisk:
 - 500 – 1000 ml til en voksen person, ca 10 minutter
 - Alternativ: 300 ml så raskt som mulig
 - Alternativ 2: leg-raise



- Direkte til angio-lab, men dårlig... kom straks!
- Klinisk: klam/svett/kald perifert, urolig, somnolent
- Vital variabler
 - sO_2 vanskelig å måle, BT 90/40, HF 120, RF 24
- Situasjonsforståelse?
- Hva gjør du nå?

- A – B – C – D
- Tenk DO_2
- Tenk perfusjonstrykk

- Invasivt BT
- Repetitive BG



- pH 7,2; pCO₂ 7,0; pO₂ 8; BE -6; laktat 6
- Hva er dette?
- Hva gjør du nå?
 - A?
 - B?
 - C?
 - D?

Rapidsystems™

ARTERIAL SAMPLE

13.12.2015 09:25
 System Name INTINSIV 1
 System ID 1265-15554
 Patient ID 75

ACID/BASE 37.0 °C
 pH 7.423
 pCO₂ 4.29↓ kPa
 pO₂ 15.04↑ kPa
 HCO₃⁻act 20.6 mmol/L
 BE(ecf) -3.9 mmol/L

CO-OXIMETRY
 tHb 11.2↓ g/dL
 sO₂ 98.4 %
 FO₂Hb 97.0 %
 FCOHb 1.1 %
 FMetHb 0.3 %
 FHHb 1.6 %

ELECTROLYTES
 Na⁺ 139.6 mmol/L
 K⁺ 4.42↑ mmol/L
 Ca⁺⁺ 1.18 mmol/L
 Cl⁻ 113↑ mmol/L

METABOLITES
 Glu 4.9 mmol/L
 Lac 2.27↑ mmol/L

pAtm 100.5 kPa

↓,↑=Out of range

- Vasoaktive medikamenter
- Noradrenalin: Hever perfusjonstrykket men øker afterload
- Dobutamin: Hever DO_2 og perfusjonstrykket men øker oksygenforbruk i myokard
- Nitroglycerin: Senker afterload (og kanskje øker DO_2) men senker også perfusjonstrykk

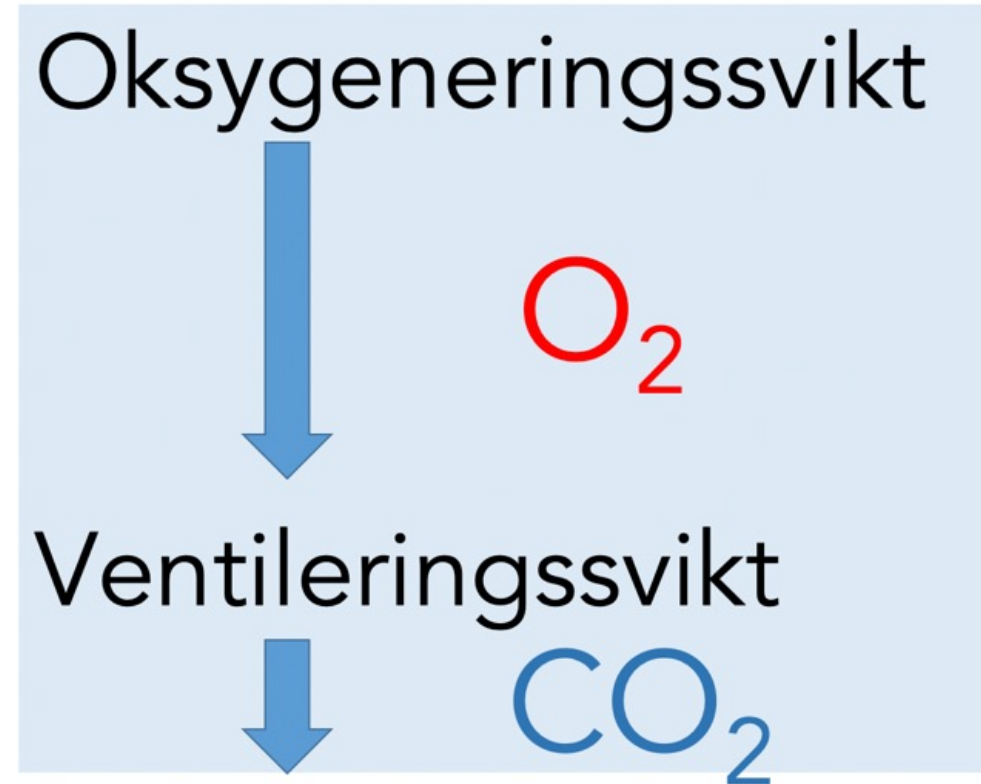
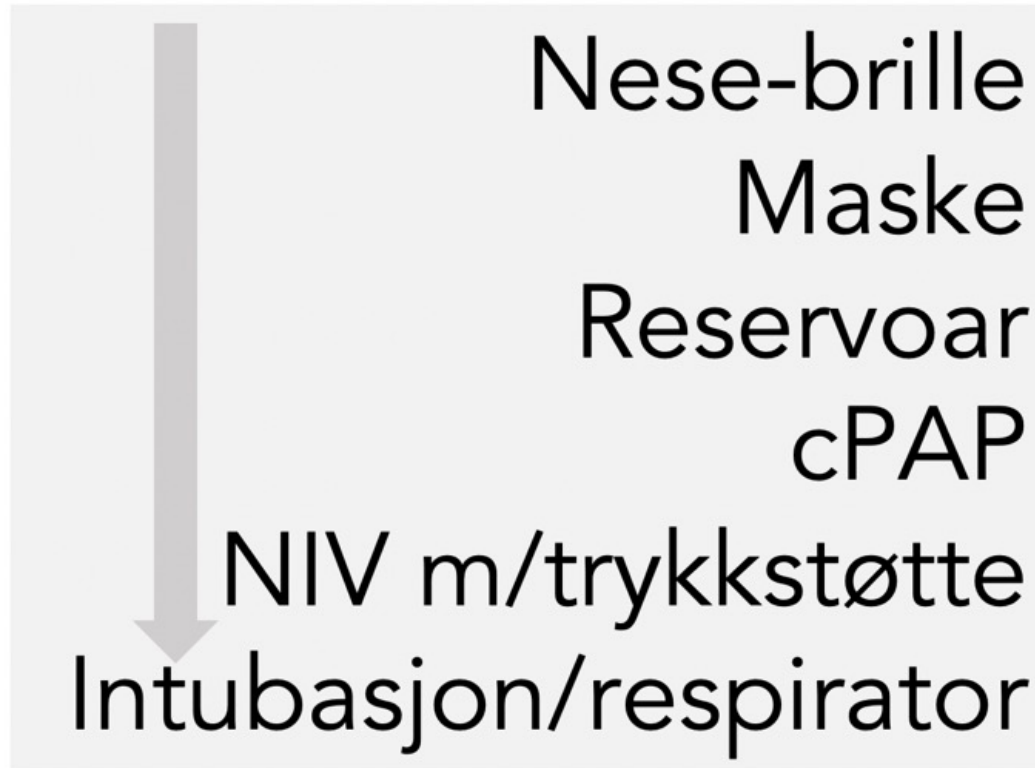
- Mekanisk støtte:
- ECMO
- Impella
- Mål: Bra nok sirkulasjon inntil stunned myokard henter seg inn

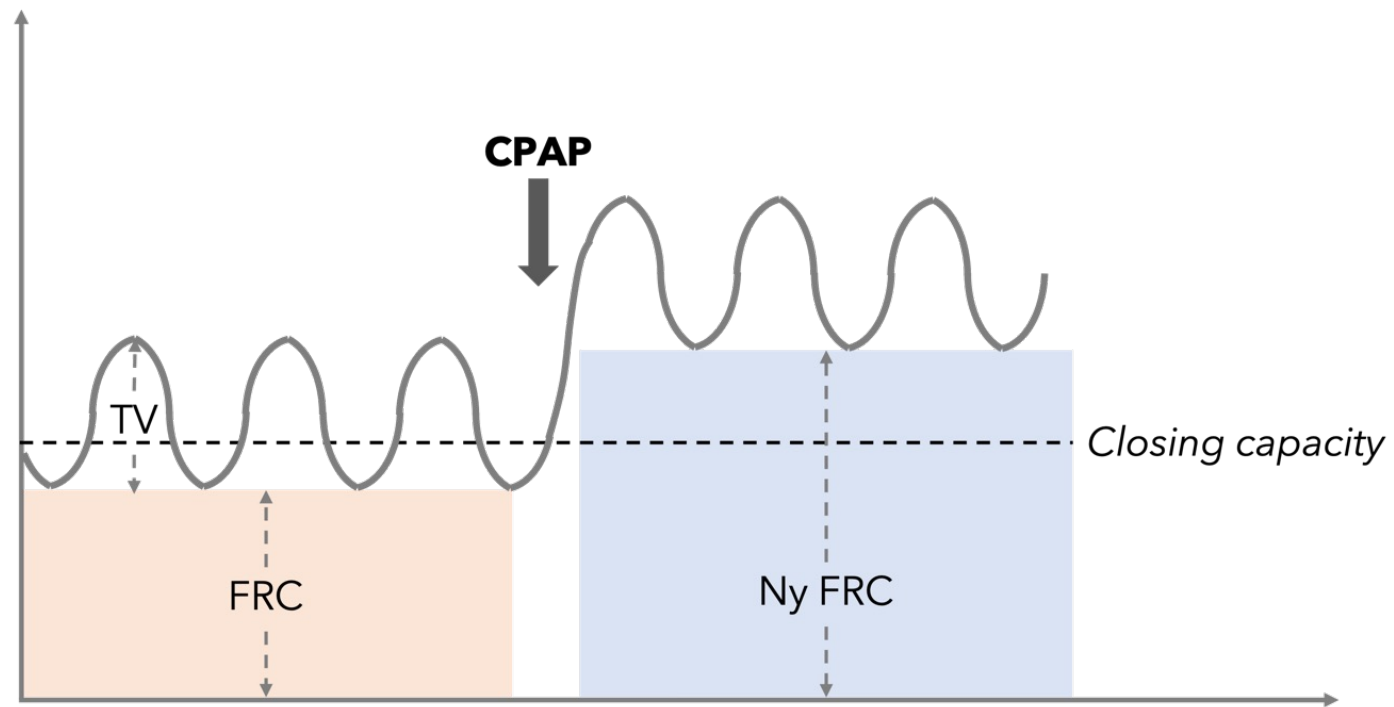
Kasuistikk 2

- 65 år gammel mann, røyker, overvekt, ingen medisiner
- Hoste og redusert AT over 2 uker
- Nå til DEG på legevakt
- Auskultasjon:
 - Inspiratoriske knatrelyder høyre side
- Vitalvariabler:
 - sO_2 90%, BT 110/50, HR 100, RR 20
- Hva er din situasjonsforståelse?
- Hva gjør du nå?
 - Behandling, transport (hvor raskt og hvordan)?

- I mottak i forverring
- Vitalvariabler:
 - sO_2 88% (O_2 på maske), BT 110/50, HR 100, RR 24
- Blodgass
 - pH 7,2; pCO_2 9,0; pO_2 8; BE -2; laktat 2
- Rtg thorax
- Hva gjør du nå?
 - Situasjonsforståelse?
 - Behandling?
 - Hvor plasseres pasienten?

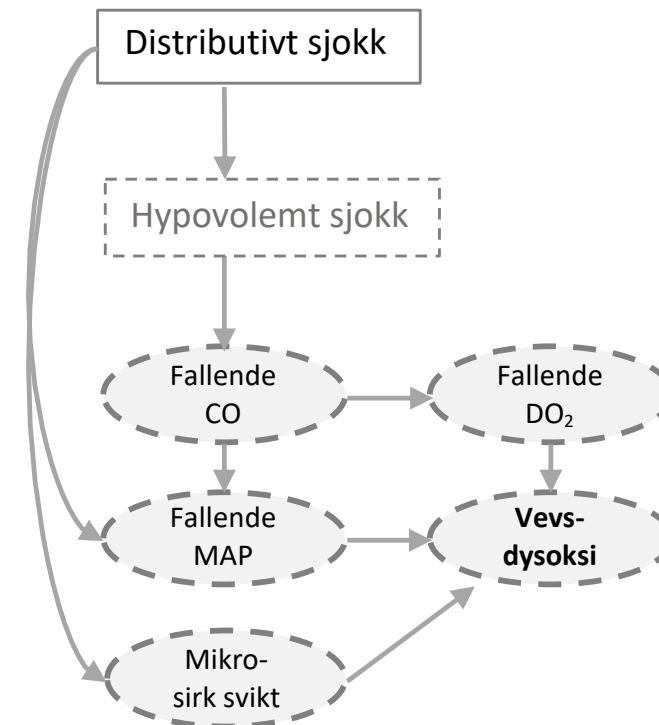
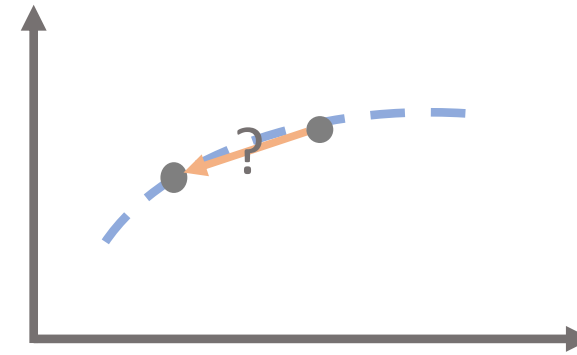






- Ny forverring på natta...
- Økende somnolent, «plukkete»/delirisk
- Nye vital variabler:
 - sO_2 88% (CPAP), BT 90/50, HR 120, RR 24
- Ny blodgass
 - pH 7,2; pCO_2 8,0; pO_2 8; BE -6; laktat 6
- Hva gjør du nå?
 - Situasjonsforståelse?
 - Behandling?
 - Hvor plasseres pasienten?

1. Fyll opp med væske!
2. Juster BT med noradrenalin!
3. Se på bedring i vitalvariabler og BG



Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021

KEY WORDS: adults; evidence-based medicine; guidelines; sepsis; septic shock

INTRODUCTION

Sepsis is life-threatening organ dysfunction caused by a dysregulated host response to infection (1). Sepsis and septic shock are major healthcare problems, impacting millions of people around the world each year and killing between one in three and one in six of those it affects (2–4). Early identification and appropriate management in the initial hours after the development of sepsis improve outcomes.

The recommendations in this document are intended to provide guidance for the clinician caring for adult patients with sepsis or septic shock in the hospital setting. Recommendations from these guidelines cannot replace the clinician's decision-making capability when presented with a unique patient's clinical variables. These guidelines are intended to reflect best practice (Table 1).

(References 5–24 are referred to in the Methodology section which can be accessed at Supplemental Digital Content: Methodology.)

SCREENING AND EARLY TREATMENT

Recommendation

- For hospitals and health systems, we **recommend** using a performance improvement program for sepsis, including sepsis screening for acutely ill, high-risk patients and standard operating procedures for treatment.

Strong recommendation, moderate quality of evidence for screening.

Strong recommendation, very low-quality evidence for standard operating procedures.

Screening for Patients With Sepsis and Septic Shock

Rationale

Sepsis performance improvement programs generally consist of sepsis screening, education, measurement of sepsis bundle performance, patient outcomes, and actions for identified opportunities (25, 26). Despite some inconsistency, a meta-analysis of 50 observational studies on the effect of performance improvement programs showed that these programs were associated with better adherence to sepsis bundles along with a reduction in mortality (OR, 0.66; 95% CI, 0.61–0.72) in patients with sepsis and septic

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5. For patients with sepsis induced hypoperfusion or septic shock we suggest that at least 30 mL/kg of IV crystalloid fluid should be given within the first 3 hr of resuscitation.

Weak, low quality of evidence

DOWNGRADE from **Strong**, low quality of evidence

"We **recommend** that in the initial resuscitation from sepsis-induced hypoperfusion, at least 30 mL/kg of IV crystalloid fluid be given within the first 3 hr"

MEAN ARTERIAL PRESSURE

9. For adults with septic shock on vasopressors, we recommend an initial target mean arterial pressure (MAP) of 65 mm Hg over higher MAP targets.

Strong, moderate-quality evidence

37. For adults with septic shock, we recommend using norepinephrine as the first-line agent over other vasopressors.

Strong

Dopamine. *High-quality evidence*

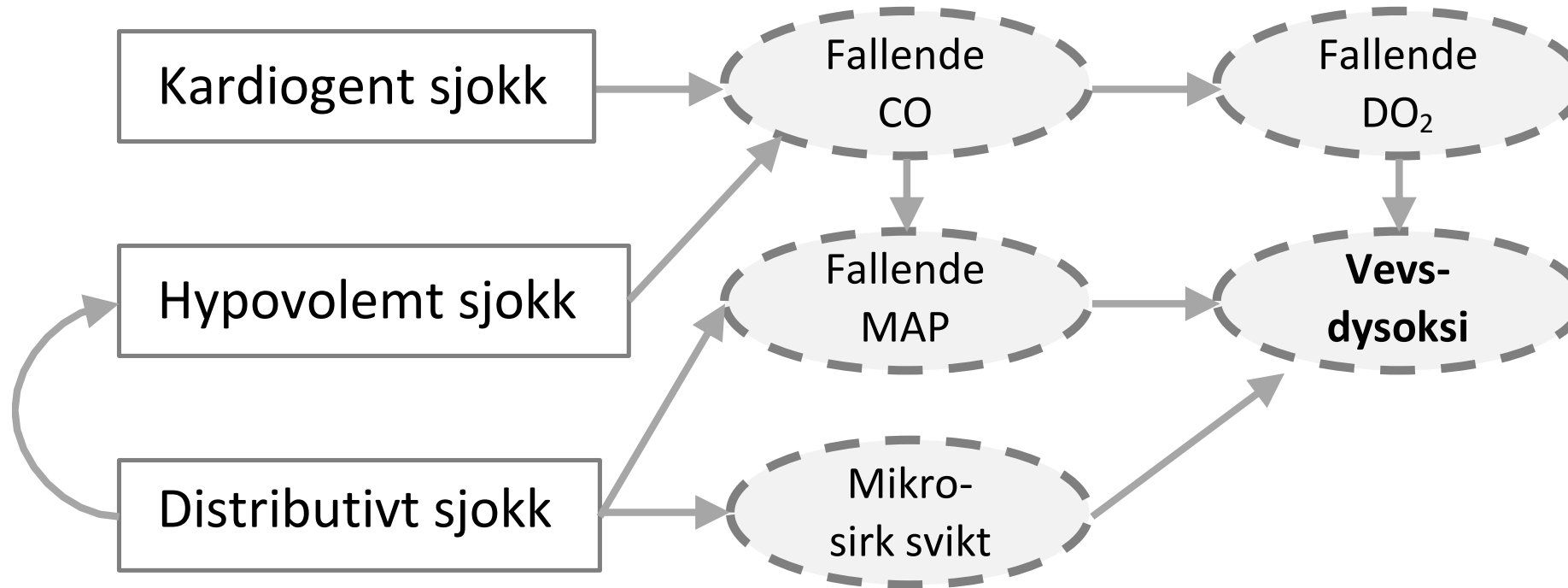
Vasopressin. *Moderate-quality evidence*

Epinephrine. *Low quality of evidence*

Selepressin. *Low quality of evidence*

Angiotensin II. *Very low-quality evidence*

Inndeling sirkulasjonssvikt



+ obstruktive sjokk

Take-home messages

- Tenk A – B – C – D
- Tenk DO_2
- Tenk perfusjonstrykk
- Mål BT, HR og sO_2
- Ta blodgass
- Foreligger truet sirkulasjon? Hvilken mekanisme?