of Corona

or

COVID-19

or

SARS-CoV-2

Achtergrond Corona

- Viral infection
- Symptoms:
  - Fever, headache, malaise
  - Cough, **SILENT HYPOXEMIA,** shortness of breath
  - Common cold, sneez
  - Reduced sense of smell or taste
  - Diarrea, abdominal complaints, anorexia

Infection

- Via aerosol
- Surface is only infectious for a short time
- Unknown: faecal infection
- **Not aerogene!!!**

PPE

- Source isolation OR isolation from environment
  - Irrational and waste of PPE
  - Severe cough will lead to spread of the virus
  - NRM / nebulizers causes aerosols (N95 /FFP1-2)

- Infection through mucosa
  - Nose / mouth / eyes
  - Mouth-nose mask, goggles OR faceshield

- Minimal infection through surface / aerosol
  - Handhygiene and apron (to protect from cough)
  - Alcohol is enough
  - Virus dies quickly
  - Few viral particles on surfaces

- Pregnancy:
  - In case series no increased risk for complicated disease course
  - Most studies without pregnant/lactating women
  - No contra-indication lactation
  - COVID+: perform good handhygiene and use mask during lactation

- Children
  - Mild disease course
  - Rare: hyperinflammatory syndrome / Kawasaki-like

Diagnostics

- PCR
  - Nasopharynx
  - Feces
- CT-scan: typical abnormalities
- Lab
  - Lymfopenia
  - Inflammation: CRP, ferritine, D-dimeer
  - LDH

- Gastro-intestinal complaianst sometimes severe, diagnostics not useful

- Serology
  - Unknown what is the value of positieve immunology
  - No routine lab test

Clinical course

- Incubation: median 5-7 days
  - Upto 14 days
- 0-7 days: viremia
  - Complaints of a viral respiratory tract infection
- After 7-10 days often worsening occurs
  - Pulmonary embolus
  - Immuno dysregulation
  - Viremia has gone down by now
  - Indication for the start of steroid therapy
- 80% asymptomatic – mild course

Treatment

- There is no curative treatment available
  - Chloroquine
  - Hydrochloroquine
  - Remdesivir
  - **Steroids**

- Supportive care
  - **OXYGEN**
  - **Nebulisation not standard required and harmful due to aerosol**
  - Keep patients relatively dry
  - Anticoagulant therapy
  - Accept anorexia in early fase

- Bacterial superinfections are rare in 0-14 days
  - In ICU watch out for central venous cathere infections and ventilatr associated pneumonia (VAP)

Remdesivir

- Binds RNA transciptase with premature ending transciption (thus preventing replication)
- In vitro and in vivo effect on MERS-CoV en SARS-CoV-2 reducing viremia en and lung tissue damage

- Adaptive COVID-19 Treatment Trial (ACTT)
  - Multinational, randomized, placebo-controlled
  - Severely ill: reduced time to recovery
  - Effect most clear in NON intubated patients
  - No effect in intubated patients or in mild disease

Steroids (dexamethason)

- Unpublished data (RECOVERY studie)
  - Randomised, open label, multicenter UK
  - Admitted patients
  - Dexamethason vs standard care
  - Lower mortality in dexa group
    - Severe patients (O2 suppletion)
    - Larger effect in IC patients
    - No effect in patients without O2 suppletion

- Unclear what er the exposure risks
  - Disadvantages
  - Influence on the course of viremia
  - Time of start dexa
  - Trial studied both suspected and confirmed patients

RECOVERY trial

- Different treatment strategies vs standard care
  - 6425 participants in preliminary analysis
    - 2104 dexa-group
    - 4321 control group, 7% cross over dexa
  - “a few” HCL, lopinavir/ritonavir, remdesivir. Tocilizumab

- Skewed age distribution
  ventilated patients mostly <70 yrs
  >80 yrs rarely 1% ventilated
- Very few pregnant women and children
- Treating physician allowed to issue a contra indication for steroids. In that case the patient was not randomised for steroids

Downside of steroids

- Steroids may exacerbate late infections
- Steroids may decrease clearance of the virus
  Steroid cause hyperglycemia and fluid retention

Hydrochloroquine

- Increase endosomal pH, virus cannot fuse with host-cel
- retrospective studies
- Bias in treating only the most severely ill patients
- RCT's underpowered
- Lancet publication with unreliable data (withdrawn)
- No evidence for effectiveness, a lot of side effects.
- NOT standard treatment

Complications

- COVID worsening
  - Fever (peaks)
  - Desaturation, tachypnea, **HYPOXEMIE**
  - Increase in X ray abnormalities
  - **Knowing the clinical course very important**

Pulmonary Embolus (PE)

- 17% ICU pt have PE despite profylaxis
- No deep venous calf thrombosis, origin is in lung cirulation
- Not clear how many complications happen using standard therapeutic anticoagulation
- Diagnostics limited
  - Clinical picture: thoracic pain, sudden worsening (pulmonary or hemodynamically)
  - ECG
  - Difficult to differentiate from COVID progression / hyperinflammation
  - D-dimer

Complications

- Hyperhydration / ARDS
  - Endothelial leakage
  - Exacerbated by increased volume therapy
  - AFib with congestive heart failure

- Hypertension / diabetes:
  - Glucose curves
  - Dehydration/ keto-acidosis with clinical picture of increasde respiratory failure (Kussmaul)

Deterioration / Assessment at ward

- **ABCDE – OXYGEN**
  - RR >20
  - Desaturation <95%

- **Be alert = control in 30 minutes**

- **Be alert to prevent fast deterioration / exhaustion**

- **Fever**
  - Take bloodcultures
  - Sputum cultures (non ICU) not usefull
  - Procalcitonine (PCT when in doubt
  - NO standardized antibiotic therapy
  - IF you start antibiotics: stop if cultures are > 72 hs negative, low PCT

ABCDE

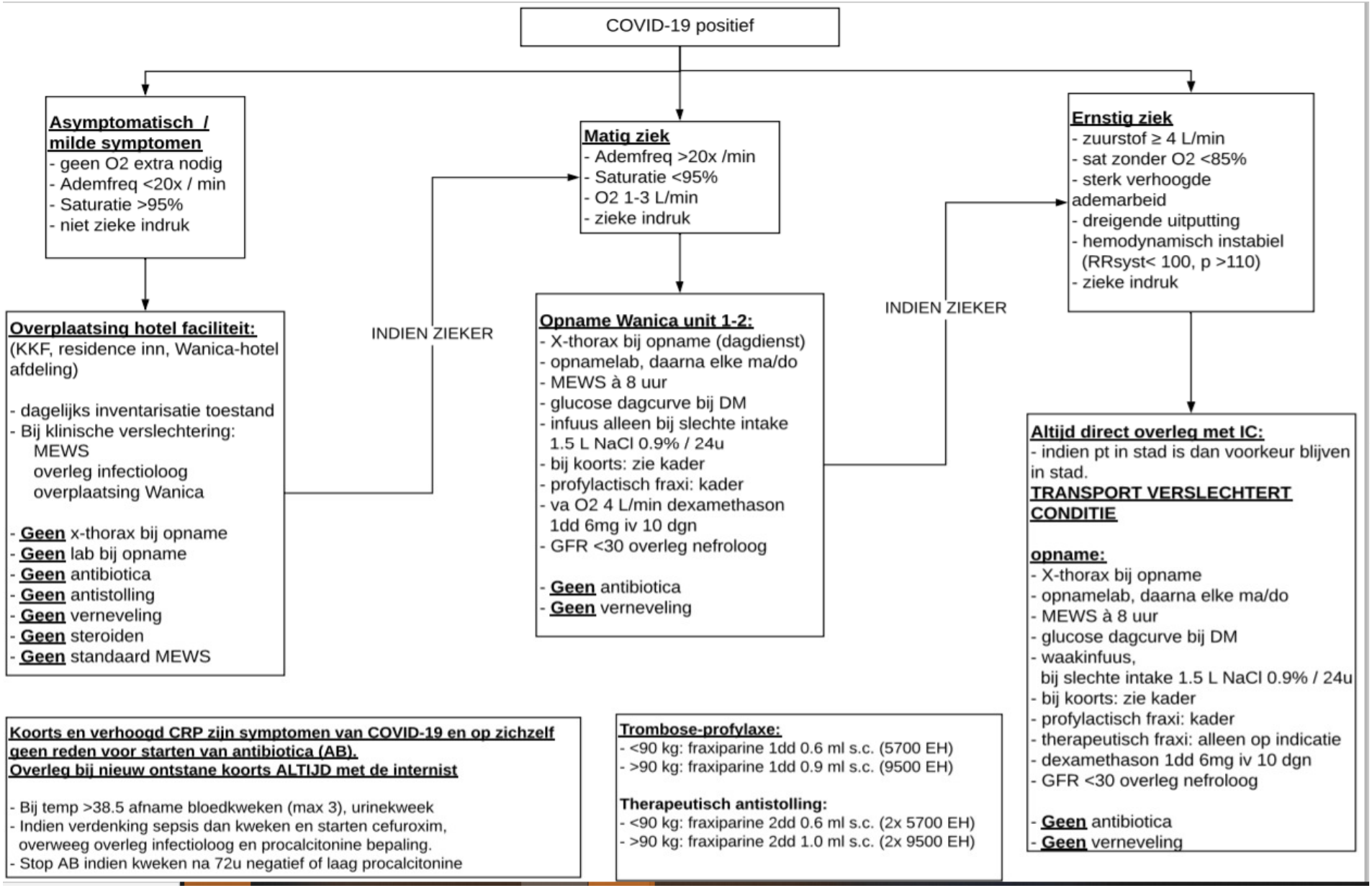
- A: spontaneous breathing, talks
- B: saturation, resp frequency, work of breathing
- C: bloodpressure, pulse, diuresis, fluid balance
- D: glucose, consciousness, delirium
- E: temp, gastro-intestinal

- Medication, stimulate mobilisation

- Admission on the ward:
  - Always evaluate the patient by yourself
  - Have nurse check vital parameters
  - Transport may lead to clinical wordening
  - Walk through the flow chart!
  - Re-evaluate pt
    - 30 min after adaptation of O2
    - 1 hour after insulin administration
    - **Confer with internist lwhen in doubt!!**

- Rounds:
  - Use ABCDE methodology
  - Make sure to have vitals ready before the start
  - Make sure nusre is present during the rounds with you

Practice NOW to be prepared LATER


COVID-19 positief
Asymptomatisch / milde symptomen
- geen O2 extra nodig
- Ademfreq <20x / min
- Saturatie >95%
- niet zieke indruk
Overplaatsing hotel faciliteit:
(KKF, residence inn, Wanica-hotel afdeling)
- dagelijks inventarisatie toestand
- Bij klinische verslechtering:
MEWS
overleg infectioloog
overplaatsing Wanica
- Geen x-thorax bij opname
- Geen lab bij opname
- Geen antibiotica
- Geen antistolling
- Geen verneveling
- Geen steroiden
- Geen standaard MEWS
INDIEN ZIEKER
Matig ziek
- Ademfreq >20x /min
- Saturatie <95%
- O2 1-3 L/min
- zieke indruk
Opname Wanica unit 1-2:
- X-thorax bij opname (dagdienst)
- opnamelab, daarna elke ma/do
- MEWS à 8 uur
- glucose dagcurve bij DM
- infuus alleen bij slechte intake 1.5 L NaCl 0.9% / 24u
- bij koorts: zie kader
- profylactisch fraxi: kader
- va O2 4 L/min dexamethason 1dd 6mg iv 10 dgn
- GFR <30 overleg nefroloog
- Geen antibiotica
- Geen verneveling
INDIEN ZIEKER
Ernstig ziek
- zuurstof ≥ 4 L/min
- sat zonder O2 <85%
- sterk verhoogde ademarbeid
- dreigende uitputting
- hemodynamisch instabiel (RRsyst< 100, p >110)
- zieke indruk
Altijd direct overleg met IC:
- indien pt in stad is dan voorkeur blijven in stad.
TRANSPORT VERSLECHTERT CONDITIE
opname:
- X-thorax bij opname
- opnamelab, daarna elke ma/do
- MEWS à 8 uur
- glucose dagcurve bij DM
- waakinfuus, bij slechte intake 1.5 L NaCl 0.9% / 24u
- bij koorts: zie kader
- profylactisch fraxi: kader
- therapeutisch fraxi: alleen op indicatie
- dexamethason 1dd 6mg iv 10 dgn
- GFR <30 overleg nefroloog
- Geen antibiotica
- Geen verneveling
Koorts en verhoogd CRP zijn symptomen van COVID-19 en op zichzelf geen reden voor starten van antibiotica (AB).
Overleg bij nieuw ontstane koorts ALTIJD met de internist
- Bij temp >38.5 afname bloedkweken (max 3), urinekweek
- Indien verdenking sepsis dan kweken en starten cefuroxim, overweeg overleg infectioloog en procalcitonine bepaling.
- Stop AB indien kweken na 72u negatief of laag procalcitonine
Trombose-profylaxe:
- <90 kg: fraxiparine 1dd 0.6 ml s.c. (5700 EH)
- >90 kg: fraxiparine 1dd 0.9 ml s.c. (9500 EH)
Therapeutisch antistolling:
- <90 kg: fraxiparine 2dd 0.6 ml s.c. (2x 5700 EH)
- >90 kg: fraxiparine 2dd 1.0 ml s.c. (2x 9500 EH)