COVID-19 – Infection control advices

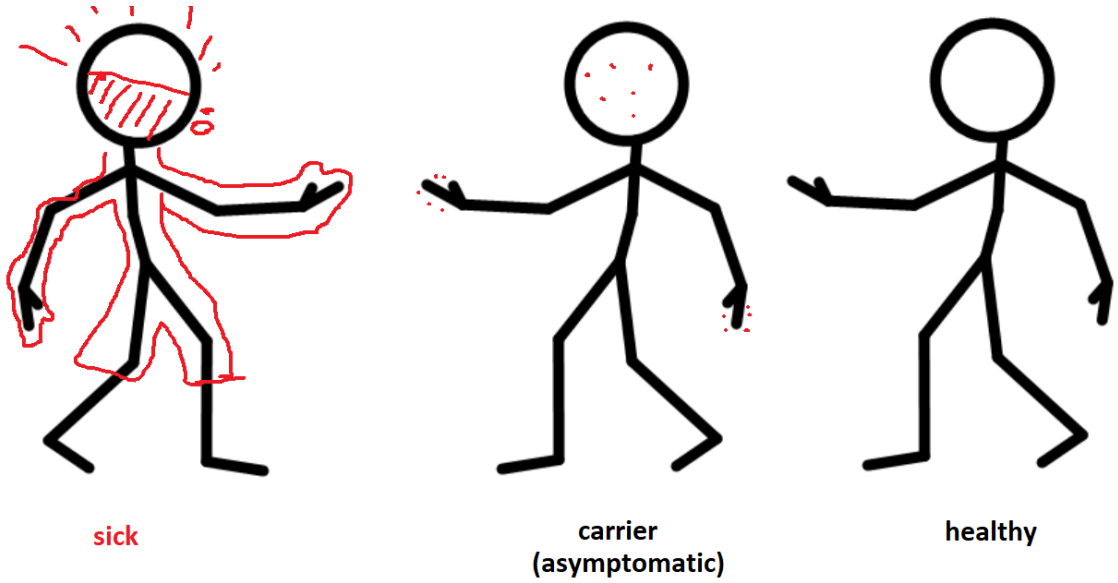
- Personal views
- Policies are guidelines
- Clinical practice
- Qualitative, not quantitative

Alin Bortan, MD
Infectious Diseases
Lawrence and Memorial Hospital
New London, CT

Yale
NewHaven
Health

Short concepts

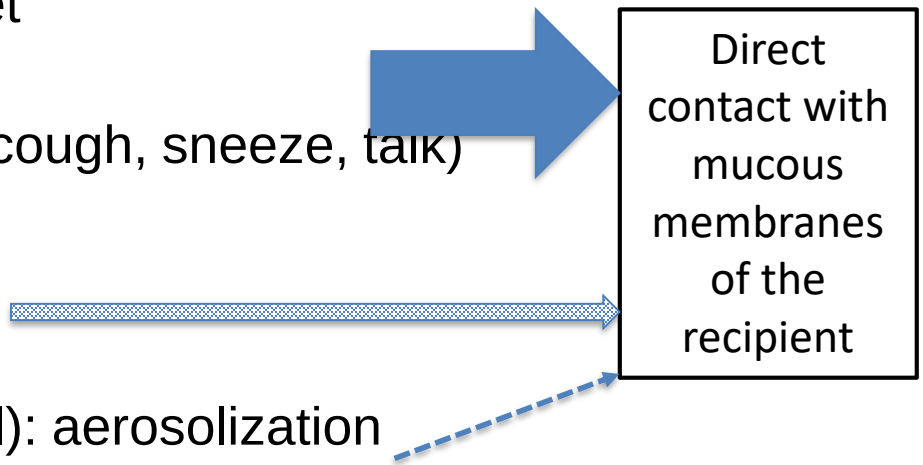
- Sickness vs. carriage (portage)



- Testing for viral load (PCR) is a surrogate for the diagnosis of the infection

Person-to-person is the primary mode of transmission

- Close range contacts ~ 6 feet
  - #1: respiratory droplets (cough, sneeze, talk)
  - #2: hand contamination



- Long range #3 (controversial): aerosolization
  - Transmission in enclosed poorly ventilated spaces (outbreaks associated with riding bus, sitting restaurant, standing hall)
  - Long range airborne transmission is possible, but not probable
  - airborne precautions are universally recommended when aerosol-generating procedures are performed (close-range situations)

Yale NewHaven Health

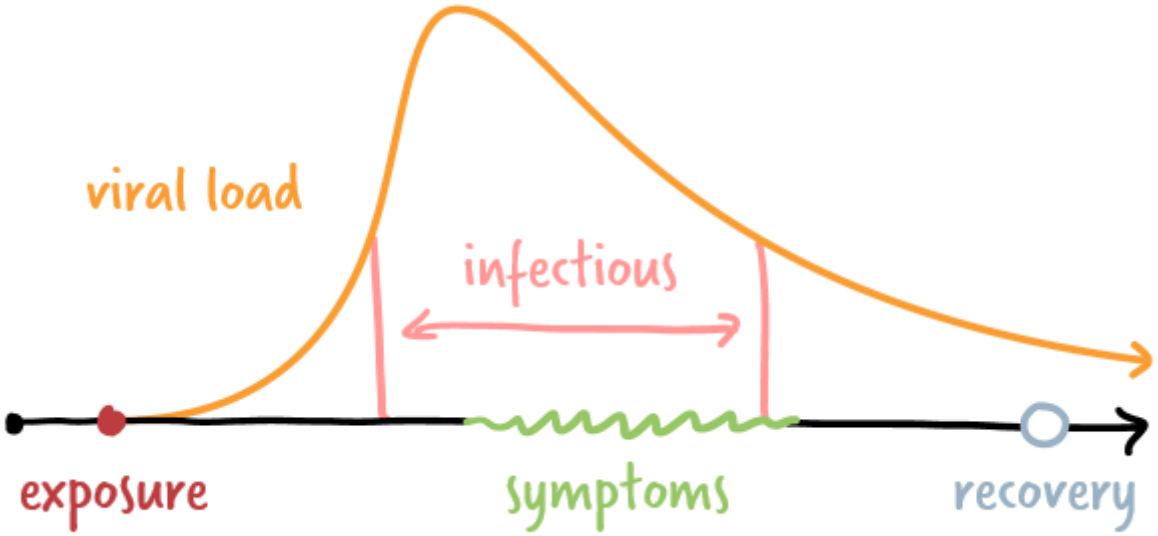
Non-respiratory specimens

- Uncertain role of transmission:
  - Stool: long time clearance RNA, occasionally (+) viral cultures
  - Blood
  - Ocular secretions
  - Semen

- Case reports - aerosolization of virus from sewage drainage
- Overall fecal – oral route not significant
- Unlike transmission through non-mucous membranes (abraded skin)

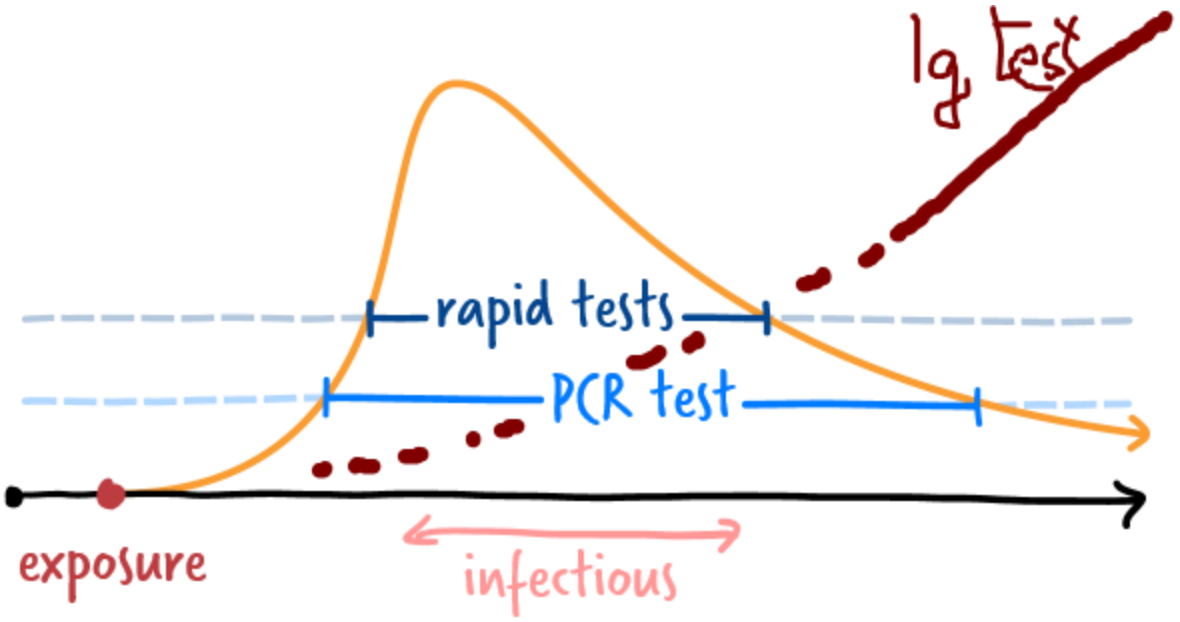
- Infectiousness started 2.3 days prior to symptom onset, peaked 0.7 days before symptom onset, and declined within seven days

Nat Med. 2020;26(5):672



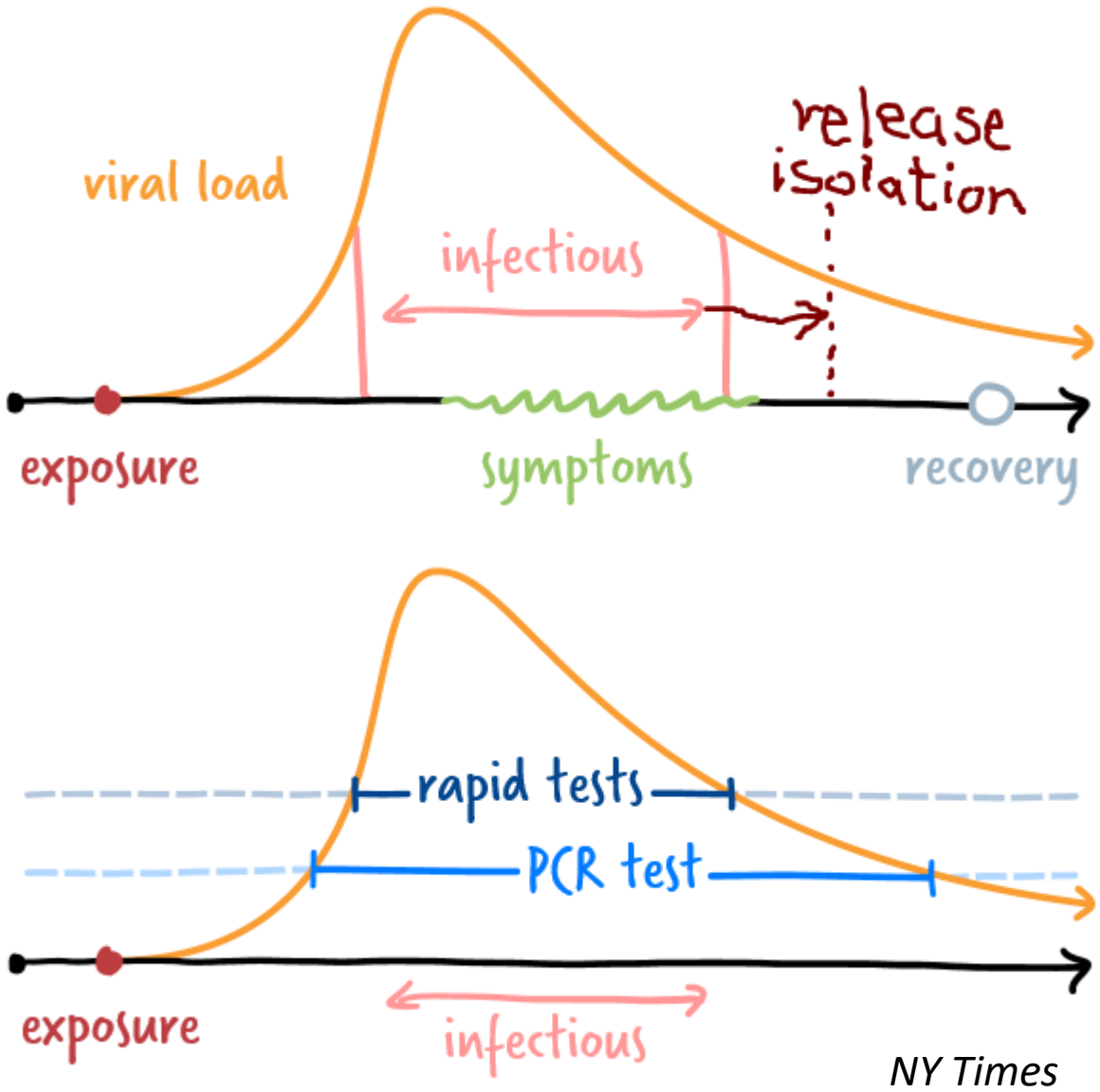
NY Times

Testing for Coronavirus



NY Times

Yale
NewHaven
Health



NY Times

Yale NewHaven Health

Transmission ⇔ Infectiousness

- Correlates with the inoculum size [RNA viral load]

- Begins before the development of symptoms
- Highest early in the course of illness
- Greatly diminishes during illness
- After 7-10 days transmission is unlikely*

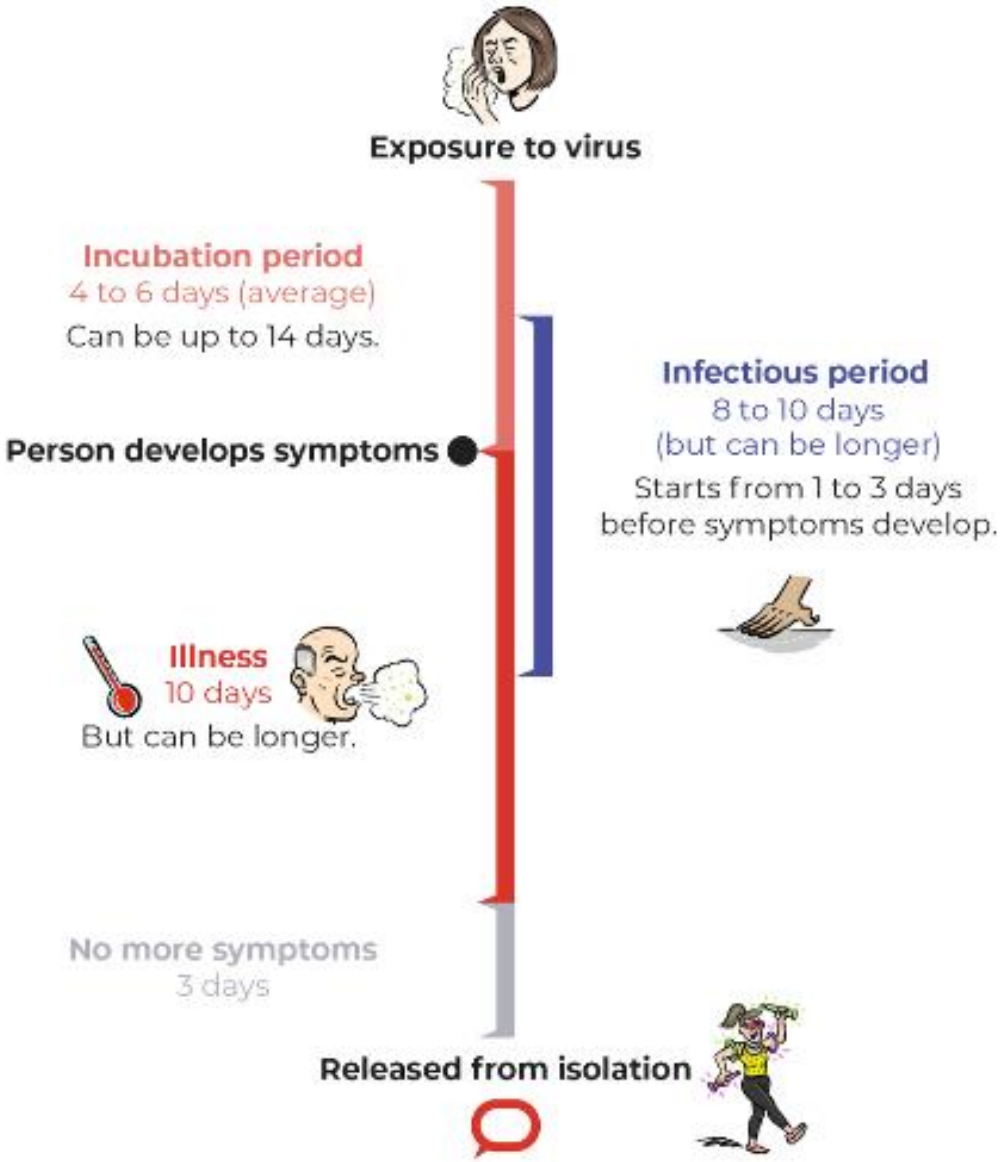
  [*immunocompetent patients with nonsevere infection]

- **Prolonged viral RNA detection ** does not necessarily indicate prolonged infectiousness**
  - viral RNA shedding is variable
  - may increase with age and the severity of illness
  - [** severe or critical COVID-19 or in immunocompromised patients]

Concepts

- Asymptomatic transmission
- Superspreading events
- Highest transmission = prolonged contact + indoors/confined space
  - Household contacts
  - Health care settings before implementation of preventive measures
  - Congregate settings: cruise ships, homeless shelters, detention facilities, college dormitories, public transportation enclosures (subways, etc)
- Low risk of transmission with indirect contacts
  - passing by someone with infection on the street
  - Environmental contamination – viral persistence varies

Coronavirus progress



NewHaven Health

Post-disease immunity

1. HUMORAL = IgG SARS-CoV2 ANTIBODY production
   ~ severity of disease
   - Uncertain duration of neutralizing activity
2. CELL-mediated
   - Immune competency
   - Life long

Is **re-infection** possible? *Sporadic cases of reinfections (vs. asymptomatic portage) have been documented*

- [animal models – re-exposure to virus: protection does exist]
- after **infection:** lower RNA levels; more rapid clearance of viral RNA
- similar behavior post **vaccination**

Yale NewHaven Health

Particular settings

- Animal contacts:
  - symptomatic felines, minks
  - (carriage – dogs)
  - (Pigs and poultry not susceptible)

PERSONAL PREVENTION STRATEGIES

- Social distancing: minimizes close-contact range exposures

- Wearing masks* outside the household
  (* all types OK)
  (* avoid touching eyes, nose, mouth)
  (* ~ avoid touching the mask)
  (* launder cloth masks routinely)

(*social distancing + high adoption of mask-wearing by the general public = the most effective preventive modalities in my opinion)

- Hand washing after touching public/environment surfaces
- Respiratory etiquette
- Cleaning environment surfaces
- Ventilation of closed spaces

Yale NewHaven Health

PUBLICH HEALTH STRATEGIES

- Community lockdown (vs universal lockdown??)
  - Stay-at-home orders
  - Closure of schools, venues and nonessential businesses
  - Bans on public gatherings
  - Travel restrictions
  - Aggressive case identification and isolation
  - Contact tracing and quarantine measures
  - social distancing + high adoption of mask-wearing by the general public
- Screening in congregate settings: Long term facilities, campuses

  ~ 0.2% rate of asymptomatic carriers – June 2020 YNHH health care workers

Yale NewHaven Health

Quarantine of 14 days

- Asymptomatic individuals with potential exposure
  - Daily monitoring for fever, cough, or dyspnea for 14 days
  - Testing 5-7 days after exposure, if possible

  - If positive (test, symptoms): stay at home quarantine x14 days + 6 feet distance

- Shorter Quarantines:
  - 10-day quarantine if asymptomatic throughout
  - 7-day quarantine if asymptomatic + negative test by day 5

Yale NewHaven Health

COVID-19 (+) patients in the community

- Home management is possible for most patients
  - Telemedicine
  - Symptom control
  - Hydration
  - PO steroids
  - Infection control at home: Isolation, minimal use of shared spaces, separate bathroom/bedroom, face mask, hand hygiene, disinfection* and disposal system)

  * diluted household bleach, solutions with >70% alcohol

- Admission indicated for higher level of care
  - (high O2 requirements)
  - (fever, diarrhea)

Yale NewHaven Health

Hospital prevention of transmission

- Room isolation of positive patients
  - private or cohorting in semi-private rooms
  - negative-pressure when available (esp. aerosolizing procedures)
- Restriction of visitors
- Universal nucleic acid testing (prior to elective procedures; upon admission)
- Use of personal protective equipment
  - Universal masking: patients, visitors and HCWs*

  (*HCW should wear masks even when not on patient-duty)
  - Hand hygiene
  - Eye protection
  - (Hair covers, shoe covers)
- Enhanced environmental cleaning and disinfection protocols

Yale NewHaven Health

Re-use of PPE (shortage)

- UV light
- H2O2 vapor
- Moist heat

(no makeup, no skin lotions, no beard oils, no write-on masks)

Yale
NewHaven
Health

DISCONTINUATION OF PRECAUTIONS (1)

FACT persistent + SARS-CoV-2 PCR testing weeks - months after resolution of symptoms

OBS virus does not remain infectious after > 10 days from onset of illness [immunocompetent patients who have improved after nonsevere infection]

FACT the gold standard for determining infectivity is the viral culture (not routinely available)

- Patients should continue to follow public health recommendations in public settings (social distancing, face masks)

Yale NewHaven Health

DISCONTINUATION OF PRECAUTIONS (2)

1. Non-test-based decisions

- Immunocompetent patients; mild/moderate disease
  - Symptom onset > 10 days **AND**
  - Resolution of fever > 24 hours prior (unmedicated) **AND**
  - Clinical improvement (eg, cough, shortness of breath)
- Immunosuppressed patients; severe COVID-19 disease
  - Symptom onset > 10 days **(up to 20 day) AND**
  - Resolution of fever > 24 hours prior (unmedicated) **AND**
  - Clinical improvement of symptoms (Cough, SOB)

2. Test based decisions = considered more powerful (discharge to NH)

- Two consecutive rapid tests for SARS-CoV-2 ≥24 hours apart
- PCR re-testing 10 to 20 days after symptom onset to assess the Ct (Cycle Threshold)

Yale NewHaven Health

Long term facilities

- symptom screening and universal use of masks upon entering the facility
- frequent PCR testing for HCWs and/or residents
- Steroid therapy is available for mild cases
- Symptom control is available – for low Oxygen requirements

- No specific therapy is available (IV formulations)

Yale NewHaven Health