Summary of the COVID-19 response at Karolinska University Hospital

Karolinska has treated more COVID-19 patients than any other hospital in Sweden

Important within-hospital actions

PATIENT LOAD COVID-19: From March to July, in total 2058 patients with confirmed COVID-19 were admitted to Karolinska. Out of these 550 were treated at ICU. This means more than 20 000 care days, 5 000 within ICU.

HOSPITAL COMMAND AND LEVELS OF ALERT: The Hospital Command Group (HCG) organized according to NATO standard. Yellow alert (partial mobilization) was activated March 12. Step down to Green alert May 08, back to normal June 02.

ORGANIZATION OF HOSPITAL:

- Somatic in-patient care: From March 12, in total 25 wards were designated "COVID-19 wards". Since July, 8 of these remained active COVID-19 wards.
- ICU bed capacity was increased with more than 400 % from 38 to 160. The extended capacity was made possible by the opening of 6 temporary COVID-19 ICU wards, the purchase of new ventilators and re-allocation of staff and equipment.
- ECMO capacity was extended from 3 to 10 beds. 28 % were out-region patients.
- Real time data analysis and information systems: Possible scenarios modelled according to available data, based on proactive plans constructed for optimal usage of available wards. Automatic reports were developed to provide near real time information to monitor the hospital situation in terms of capacity and needs.
- Continuous prediction of COVID-19 patient load: Two weeks in advance to be prepared for and meet the upcoming needs.

HUMAN RESOURCES: HR management mandate to re-allocate all staff within the hospital. In total, 478 re-allocations (in-hospital and from the region) + 412 new recruitments – within two months. COVID-19 education and training programs for health professionals included 926 staff (excl. e-learning).

INFORMATION AND COMMUNICATION: Daily e-mail with updates to managing directors, HCG and other staff in key positions. Weekly meetings with managing directors. Information by intra-site, official site, monitors in the hospital and press releases. Daily reports to Regional Medical Command Center.

PREVENTION MEASURES OF INFECTION CONTROL IN HOSPITAL FACILITIES:

- Guidelines for infection control, social distance, protection gear and healthcare procedures. Tents outside ED March 14.
- On-site meetings replaced by virtual meetings when possible for patients, relatives and staff
- Almost all hospital visits forbidden from March 12, including those of relatives of hospitalized patients.
- Out-patient clinics closed, on-site consultations to a limited extent. Visits replaced by streaming sessions or phone calls.
- Restaurants and cafeterias open but no buffets. Pharmacies and shops open.

CRISIS SUPPORT: Programs to support patients and families to cope with isolation and anxiety and to support communication and information. Psychological debriefing-programs for staff.

FOLLOW-UP OF THE HOSPITAL'S RESPONSE: Enquiry to all co-workers and managers. Separate evaluation of the HCG.

TESTING: Rapid scale-up to test the public for COVID-19. More than 500 000 tests (PCR and antibodies) performed by the Karolinska University Laboratory – open 24/7, providing new testing sites and development and validation of new methods. Regional co-ordination of tests and capacity to perform analyzes for other regions in Sweden when needed.



Important research actions

- A large number of COVID-19 studies initiated, mainly in collaboration with Karolinska Institutet. (Until August 13, 2020 Karolinska has 85 approved clinical studies.)
- Study including **possibility for all co-workers at Karolinska University Hospital (15 000) to be tested** for PCR and antibodies, starting April 20.
- Two biobanks with samples from COVID-19 patients established to improve the conditions for development of new knowledge and future treatment.
- A quality database for all COVID-19 patients at ICU.
- **Study of psychological health** in the aftermath of the pandemic, evaluating long-term effects for patients, relatives and healthcare personnel.
- Worldwide study on staff exposure to COVID-19.
- Collaboration with the Network Medicine Institute and Alliance to the design of a **global drug repurposing study**.

At the most Karolinska provided 50% of all COVID-19 care in Region Stockholm

Important regional and national actions

- Swedish government guaranteed to cover expenses for COVID-19 care.
- Regional decision to re-allocate healthcare staff (incl. private providers) within the region from March 23.
- County Council mandate for operative co-ordination of beds on a regional level from March 25.
- Crisis contract with staff established by county officials from April 3, involving ICU nurses. From April 29 contract extended to include intermediate care.
- National/regional guidelines for infection control, social distance, protection gear and health care procedures.
- Procurement of critical pharmaceuticals changed from regional to a collaborative national responsibility.

Innovation supporting the response

- Increased use of video patient visits (→ >100 units), support at a distance for relatives (new service, ICU et.al.), peer conferences and consultations (+180%*), research meetings etc. *April 2020, compared to April 2019
- **Digital forms and certificates** to support staff, patients and external contacts.
- **Testing services for patients and staff** (digital tools, test-kit home delivery, mobile testing clinics).
- **App for staffing**, supporting quick ramp-up and re-allocation.
- Creative collaborations with other caregivers, government agencies – and private companies (logistics and transportation, design, development and manufacturing etc.)
- Iterative development of new routines and ways of working, including decision making.
- A collaborative robot relieves laboratory staff from repetitive tasks (scans test tubes and opens transport sleeves).
- *Future possibility:* A pilot could lead to a more systematic use of RobotProcessAutomation in administration.

Important local (e.g. within city) actions

- Karolinska established a local **command center for supply of materials.** Representatives from other acute care hospitals in the region connected to the center. Main tasks were to find solutions for and acquire protection gears, medical supplies, drugs etc. and to allocate them to the most critical areas.
- Region Stockholm decided to move the **regional procurement for supplies** to Karolinska and the command center extended to include representatives from all healthcare providers in the region.
- Stockholm residents free-of-charge corona-virus PCR and antibody tests from June 15.

European collaboration Participating in **COVID-19 Task Force** within the European University Hospital Alliance, EUHA.