Facts about the New Karolinska Solna

The New Karolinska Solna (NKS) will be a new and super modern University hospital with the mission to carry out highly specialized and specialized medical care as well as research and educational training on a significant scale and at highest quality. The new Karolinska University Hospital will open for the first patients in 2016 and will be completely ready during the fall of 2017.

The most important key term for the new University hospital is patients first, which means that the entire planning of the hospital is based on what is best for the patient. The goal is to provide right care to the right patient at the right time. The patients’ autonomy, safety, integrity and comfort are fundamental and can be enhanced with single rooms, which will be standard for all inpatients. Proximity, good logistics and less need to transport patients will significantly increase efficiency and safety.

An important task is to strengthen collaboration between medical care, clinical research, basic research and training (at the Karolinska Institute) to better contribute to the development of medical care so that new findings from research can be more rapidly be put to use in medical care. Medical care, research and educational training at the NKS should be able to reach world class.

The new Karolinska Solna is of utmost importance in the realization of the vision – which is shared by and the industry, academia and medical care - of making the Stockholm region the world’s leading region in life sciences.

The Hospital’s Facilities

The hospital's exterior

The New Karolinska Solna will merge into the new city area around the Haga city area. Due to its size of 9-11 floors and around 320 000 square meters, the new University hospital will be a landmark. The design is based on a rectangular district structure, which will form the continuation of the inner city neighborhood. The façade will have warm white tiles with details of red brick a mantle glass structure.

Five buildings with care activities in the south will run outwards to a big square. To the north of the health care district will be the research buildings, the already existing Thorax building and a new technological building and indoor parking. Between the health care quarter and the research quarter, there will be a green “academic passage” which will link the hospital area with Hospital Park in the east and the Karolinska
The interior of the hospital

Patient care at the NKS will be organized according to themes, forming the basis for the general location of the different operational areas and functions within the facilities. The departments and other care functions that have a close working relationship, for example, intensive care unit and surgery, or the emergency room and imaging, are in close proximity to create an efficient flow of patients. The meeting rooms and other common areas are planned so that several functions can easily share locations.

The premises will have a uniform layout on a general scale that is common to all floors. The rooms shape and size is based upon a principle of generality, which means that the rooms should fulfill a number of different functions. Important components associated with generality relate to uniform ceiling height, the extent to which floors can sustain heavy weights, and technical systems being designed for expansion.

All of the inpatient wards consist of 28 hospital rooms, a ward on each floor located at the care hub. The wards are divided into four groups of seven hospital rooms. As support facilities are located in the proximity of each group, patients are surrounded by a smaller staff group, which facilitates continuity of care.

All hospital rooms for inpatients are single bedded rooms with space for relatives to rest or stay overnight, with separate showers/toilets. Big windows provide light and a view of the green courtyard. Single bedded hospital rooms give rise to increased privacy, comfort and safety for patients. It also prevents spreading of infections, reduces risk of falls and administration of the wrong medicine.

Art

There is also a certain amount of capital put aside for an artistic decoration of the hospital. The investment in art has been sanctioned at 118 MSEK and is divided into an amount for immovable art and an amount for movable art. All art forms will be owned by the County Council. The movable art will be financed by the County Council and is planned and procured on an ongoing basis by the County Council’s Art Project Group (Cultural Services).
The hospital’s patient flow will be divided into two main flows, an elective (planned) flow and an acute flow. The elective patient flow will enter via the main entrance and will be directed via the reception to the right staircase and elevators. The acute flow will be located in the two east buildings by the hospital car park, where emergency and ambulance services, trauma facilities, surgery and intensive care facilities are located, as well as imaging and functional diagnostics.

The hospital will have a clear and functional main entrance and lobby, which will form the heart of the facility. It will have a ceiling height extending three floors with a light and airy inside court area bordered by the reception, info technology area, cafes, restaurants, lounges, pharmacies, etc. From the main entrance, all the flows in the facilities can be accessed, with the main reception area as the center point.

Staff flows will be through a public entrance (patients and visitors) that lies along the southern facade and a professional entrance (staff, students and patients undergoing treatment) to the north side, which is not accessible to the general public. In addition there will be separate flows for freight and bed transport. The research building north of the Academic Passage will have its own main entrance, with reception at Solnavägen.

The NKS will have a main kitchen with great flexibility such that switching to production kitchens is possible.

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**Care facilities and capacity**

The capacity of the NKS will in many respects be comparable to today’s Karolinska University Hospital in Solna. In some respects, the capacity will be greater than today. This applies, for example, to intensive care, to advanced neonatal care and intensive child care, to access to advanced imaging and functional diagnostics and other advanced diagnostics, as well as increased capacity for interventional radiological treatment and advanced surgical treatment.

The higher number of intensive care and intermediate care units will allow the NKS to simultaneously treat far more severely ill or injured patients (highly specialized care) than is possible today. Meanwhile, the NKS will have fewer general care units than currently available at today’s Karolinska Hospital in Solna. This will place greater demands on the post-care and rehabilitation capacity in other parts of the County Council and the county’s municipalities.

Private hospital rooms in the NKS will permit greater capacity for receiving patients, as often in non-private rooms with multiple beds, some are vacant during certain periods.
– and male and female patients cannot be placed in the same room.

It is worth noting that about 300 beds in the Stockholm County Council are currently occupied by patients with conditions caused by medical treatment, such as falls, hospital infections, etc. This can be greatly reduced by creating a much safer environment for medical care, through private rooms for example.

Short summary of the capacity of NKS:

- Around 600 inpatient rooms (400 care rooms, 75 rooms for intensive care, 50 rooms for intermediary care and 75 rooms for post-operative surgery)
- 100 rooms for day care
- 100 rooms in the patient hotel
- 36 fully equipped operating rooms, including three so called hybrid rooms and a number of intervention rooms
- 8 so-called radiation bunkers
- Sufficient space for advanced imaging and functional diagnostics
- Approximately 180 reception rooms

Research and education

The goal with research, development and training at NKS is to:

- Create added value for the patient by integrating medical care, research and education
- Establish a creative environment for modern, state of the art research
- Establish a strong link between clinical and imperative research and education at KI (a sleepless campus)
- Act as a regional center for innovations within biomedicine and biotechnology (KTH, SU, industry)

The clinical research and teaching facilities at the NKS will be of high standard with a number of specialized laboratories, including a GMP-Laboratory (Good Manufacturing Practice), a cyclotron lab and a hot lab for the production of different isotope-labeled compounds for the examination of patients using a PET/CT camera. It will also have special MRI scanner for research. The teaching facilities are modern and the split of different types of rooms for teaching reflects a modern problem-based teaching approach.

It should be possible to conduct research related to patients as an integral part of the medical care/daily activities, which is why facilities near the patients will be created for documentation and certain investigations in the medical care surroundings.

Sustainability

The County Council has set very high standards at the hospital in terms of sustainability. The facility will be classified according to the environmental
classification system "Environment classified building", and “gold” best class will be attained for the facilities as a whole.

In environmentally classified buildings, it is primarily interior surroundings, use of materials/products and energy that are assessed. The facility will also be certified as according to LEED.1

Energy

Interior surroundings and choice of materials

Energy will be supplied through a combination of hospital generated energy and District heating/cooling. The energy produced by the hospital will come mainly from a heat pump plant where there will be, among other things, 140 boreholes and solar panels. The plant will store heat from the summer for the winter and the cold from the winter for the summer.

The estimated need for energy for the building is around 120 kWh/m² per year. Together with energy for the different operational entities, the amount of energy required is about 240 kWh/m² per year. Some of this energy will be supplied by the power plant (geothermal layer), which means that the total amount of energy which will need to be purchased is estimated at about 160 kWh/m² per year, which can be compared to the existing Swedish university hospitals which use about 260-280 kWh/m² per year.

All electricity used in the new hospital will be renewable. Other heating and cooling energy that cannot be obtained from the geothermal plant will come from the neighborhood heating and cooling suppliers, where energy production is mostly renewable. This means that the entire facility's energy use (electricity, heat and cooling energy) will be comprised of at least 98% renewable energy with low carbon dioxide emissions.

Indoor environment and materials

The agreement is significant demand for a good indoor environment for all who will be staying in the buildings. The requirements apply to all of the thermal environment for air quality and noise environment. There are also stringent requirements for materials, so that the environmental and health hazardous materials can be avoided whenever possible.

The agreement places significant demands on a well-designed interior for everyone staying there. The requirements apply to everything from thermal conditioning to air quality and noise level. There are also stringent requirements for materials, such that environmental and health hazardous materials are avoided whenever possible.

Construction and transport

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1 LEED=Leadership in Energy and Environmental Design. LEED is an environmental classification system for an overall assessment of the building’s environmental impact, which covers both the energy aspect and other environmental influences.
Environmental issues during construction will be handled by the project company through something termed the “green work place”, which entails the means to minimize environmental impacts during construction as well meet the requirements of the documented specifications. The project company will also work on the operating procedures for the handling of shipments during both the construction phase and during daily running of the facilities.

Overall operational content

The County Council makes the decision regarding the overall operational content for the NKS, which means that highly specialized and specialized care in Stockholm’s County Council will be concentrated within the NKS. Furthermore, it has been decided that a theme-based classification of patient care will form the basis for further work regarding the specialization of the care units in detail and act as an organization model for the NKS. Decisions relating to this will be made in the second half of 2011.

A thematic dimension within medical care is closely aligned to the strategic direction for research that is now being developed at the Karolinska Institute. Thematic centers for so-called translational research are winning more and more ground. These support collaboration and enable quick dissemination of knowledge between basic research, clinical research and medical care and help ensure that clinically important findings reach other caregivers.

The goal is that the NKS will provide a high proportion of highly specialized care, i.e. care for the most seriously ill and injured patients, being resource, competent and research intensive.

The NKS will be equipped with an emergency department that is well designed and equipped and well prepared to meet various future needs. A special trauma unit will be available, which will allow the NKS, on a large scale, to care for cases relating to serious diseases and accidents within the entire county of Stockholm, and more highly specialized emergency cases in other regional districts and patients abroad. The six medical themes that will for the basis for the operational content of the healthcare at NKS are as follows:

- Pediatrics
- Cancer
- Cardiology
**NKS Facts**

- **Area:** 320 000 square meters (same area as 24 Honored skyscrapers)
- **Number of floors:** 5 (mantle) – 11 (care hubs)
- **Number of rooms:** around 8 000 in total
- **Number of inpatient rooms:** 600 (400 care rooms, 75 rooms for intensive care, 50 rooms for intermediary care, 75 rooms for post-operative surgery, 100 for day care and 100 rooms in the patient hospital.
- **Number of operating rooms:** 36
- **Number of radiation bunkers:** 8
- **Number of reception rooms:** around 180
- **Price of the construction:** 14.5 billion SEK (current prices)
- **Builder:** Skanska Healthcare
- **Architect Tengbom** (design based on White Architects’ Design Concepts Forum Karolinska)
- **Owner project company:** Skanska, Innisfree
- **Number of staff involved in the construction project:** maximum approximately 2000
- **Service partner (FM-services):** Coor Service Management