STATISTICA is helping the General University Hospital in Prague with clinical research of drug optimization

KEY POINTS

Business
General University Hospital in Prague

Overview
· GUH is one of the Czech Republic's largest healthcare facilities
· Clinical pharmacology research study requires multidisciplinary cooperation on both individual and group treatments
· GUH prefers a software solution that doubles for post-graduate level instruction and use in professional publications

Challenges
The goal is for young patients to receive drug doses that correspond to their ages, clinical conditions, genetic makeup, and other factors. This requires sophisticated software that can model these variables and "recommend" drug dosages, allowing for individualized, optimized treatment plans that reduce patient hospitalization and drug costs. However, outsourcing has proven to be inefficient.

StatSoft Solution
STATISTICA Standard

Results
· *STATISTICA* now performs a significant role in the individualization and optimization of drugs for GUH patients
· *STATISTICA* has proven to be of tremendous benefit to the GUH academic sector

"Cooperation with StatSoft CR was exemplary [and their] representatives continue to be excellent partners in the area of client support and training."

— **MUDr. Pavla Pokorná**

Specialist Physician, Pharmacology Institute of General University Hospital

BACKGROUND
The General University Hospital (GUH) in Prague is one of the largest healthcare facilities in the Czech Republic. It provides basic, specialized, and highly specialized medical treatment as well as nursing, outpatient, and diagnostic care for children and adults in all primary areas. It also provides comprehensive pharmaceutical care, including technically demanding preparation of cytostatic and sterile medical products.

CHALLENGE
In connection with an efficient and highly successful patient treatment process, the GUH performed a clinical research study. One aspect of the research was clinical pharmacology (pharmacogenetics, pharmacokinetics, pharmacodynamics) at intensive care units, whose practical use for patients entails drug dosages (doses plus intervals) individualized and optimized for specific patients.

One such example would be a child with a specific pathological condition requiring an individualized treatment mode, e.g., whole-body hypothermic treatment, or extracorporeal membrane oxygenation (ECMO), or haemodiafiltration (HDF). As a practice, this facility performs individual pharmacokinetics/pharmacodynamics (PK/PD) and therapeutic drug monitoring (TDM) for patients in all cases of treatment where the effect of a drug depends on dose, plasmatic concentration, and therapeutic range.

Processing of primary data and assessment of a given drug's effect and movement within the organism for a larger group of patients—e.g., in a population of critically ill newborns and children—require not only multidisciplinary cooperation, but also suitable software.

Aside from this purpose, this software is also used for post-graduate level instruction, lectures, and high-quality professional publications.

In the past, the GUH addressed these needs via outsourcing, which was shown to be inefficient and unsuitable as it involved working with suppliers who do not understand this field completely.

Requirements of the General University Hospital
The GUH decided to find and implement software that can primarily help modify drug dosage, to put it simply. The goal is for patients to receive drug doses that correspond to their current ages, clinical conditions, and other factors such as genetic makeup. This requires sophisticated software that can model these variables and "recommend" drug dosage. All defined needs are met by *STATISTICA* Standard Cz from StatSoft CR, a regional StatSoft office in the Czech Republic. The GUH acquired *STATISTICA* in 2012.

HOW *STATISTICA* HELPED

The software was installed quite easily during the course of one day by the hospital's IT staff. Aside from minimum support requirements during installation, the StatSoft team also provided standard training as needed.
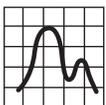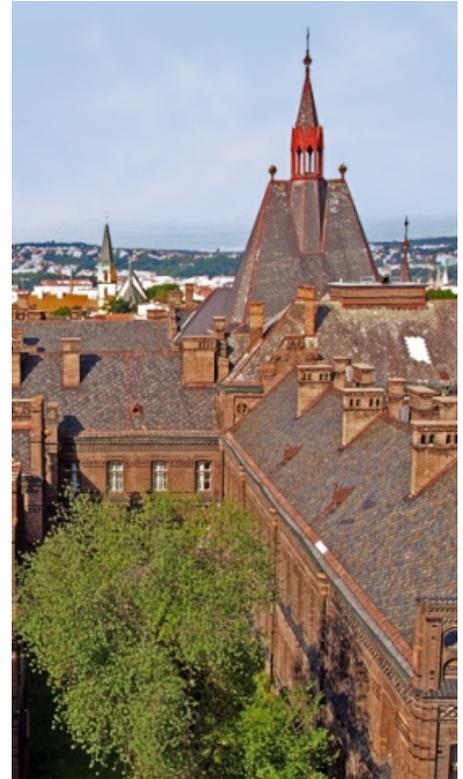
Cooperation with the supplier

 "Cooperation with StatSoft CR was exemplary during both pre-implementation and implementation phases. The supplier's representatives continue to be excellent partners in the area of client support and training activities, such as providing seminars in the area of statistics," says MUDr. Pavla Pokorná, specialist physician and children's clinic assistant – the Pediatric Clinic, the ICU of General University Hospital, the Pharmacology Institute of General University Hospital, and the First Faculty of Medicine of Charles University in Prague.

RESULTS

The StatSoft software is currently performing a very significant role in the individualization and optimization of drugs intended for GUH patients and, subsequently, all patients in general.

The research system is as follows: Using available parameters—the patient's age, clinical condition, genetic makeup, and other variables—the software creates a treatment dosage "proposal." Positive and negative changes in drug effects related to dosage and concentration are monitored. Research includes the dosage program, patient individualization, and drug effects for extracorporeal blood circulation. The research is passed on to the State Institute for Drug Control (SÚKL), which performs correlation of research results and validation.

The main goal, using the implemented software, is to reduce patient treatment time, drug acquisition costs, and hospitalization time for individuals, thus leading to reduced costs for patients and the hospital facility itself. *STATISTICA* is also of tremendous benefit to the academic sector, including pre-graduate and post-graduate research.

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