

# Top Technology Trends in hospital design

## Sustainability

### Green hospitals

#### ELEMENTS

- New energy-efficient design principles
- Building management systems (BMS) monitor and control facility systems and energy use
- New systems with higher energy efficiency (e.g. heating, ventilation, LED lighting, air systems)

## Devices, machines and processes

### Precision medicine

#### APPLICATIONS:

- Using genetic information to select drugs and set doses
- Designing individual drugs for cancer treatment
- Metagenomic sequencing on microbes and pathogens
- Identifying biomarkers for immunotherapy
- Use of stem cells for regenerative medicine

### Automation and robotics for routine processes

#### BENEFITS:

- More time for caregivers for genuine patient interaction
- Facilitation of delivery
- Logistical support

### Robotics in the OR

#### CHALLENGES:

- Rapid changes in technological basis
- Increase in complex operative procedures to serve an aging population

### Hybrid Operating Room

#### BENEFITS AND CHALLENGES:

- Benefit: Seamless combination of different surgical methods
- Challenge: Conflicting requirements of different surgical methods

## Digitalisation

### Artificial intelligence

#### APPLICATIONS

- Interpretation of imaging results
- New predictive models
- Decision support
- Incorporation of big data and data processing

### Connectivity between devices/Interoperability

#### BENEFITS AND CHALLENGES

- Huge benefits in improved care and reduced costs for real-time applications
- Challenge of overcoming legacy separations and guaranteeing data reliability and security

### New imaging methods in the OR

#### APPLICATIONS

- Preoperative image-based planning
- Intraoperative (real-time) image guidance
- 3D image rendering from various image sources

### Virtual reality and augmented reality

#### APPLICATIONS

- Entering 3D renderings of planned hospital spaces
- Obtaining end user input early in the design process
- Superimposition of digital information to evaluate design options and compare actual construction with design plans

### Building Information Modelling (BIM)

#### APPLICATIONS

- Construction of a 3D visualisation of the building and projections of relevant technical specifications and systems information
- Scheduling and tracking during construction (e.g. material lists, design changes)

### Real-time locating systems

#### APPLICATIONS

- Better inventory control
- Environmental monitoring (e.g. temperature levels, drug storage)
- Tracking of particular patient groups
- Improved control and prompting of correct (hygiene) behaviour

### Telemedicine

#### APPLICATIONS

- Long-distance contact and image-based interaction
- Remote patient care and monitoring (in and outside the hospital)
- Remote access for robotic surgery
- Data exchange and conferencing between consulting physicians
- Telenursing

### Cybersecurity

#### SOURCES OF RISK

- Critical digital data
- Growing volume of data exchange
- Widely varying levels of IT system security between institutions
- Widely varying levels of digital expertise
- Major payoffs deriving from criminal theft and blackmail

#### IMPRINT

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