Clinical Engineer in the Surgical Center

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Berthone Venâncio Soares

- Health Technologist
- Automation and Control Engineer
- Specialist in Clinical Engineering

- Clinical Engineering Coordinator at Hospital Albert Einstein
- Academic Coordinator of the Specialization Course in Clinical Engineering at Hospital Albert Einstein

- 17 years working at Albert Einstein Hospital
- 10 years working with a focus on the Surgical Center

**My mission:** To make the daily life of the Surgical Center safer for everyone, using management and engineering techniques.
With more than 60 years of existence, Sociedade Beneficente Israelita Brasileira Albert Einstein still maintains one premise: innovate and grow, always with excellence. It all started at a meeting of friends with a proposal to build a hospital. The dream became the commitment of the Jewish community to offer the population of Brazil a reference in the quality of medical practice and it has been done. Inaugurated in 1971. Since then, it has become a reference in treatment with cutting-edge technology and humanized care and has expanded its borders with social responsibility actions and activities of teaching and research. It has 663 beds and was the first hospital outside the United States to be accredited by Joint Commission International. Below some of their certifications.
Hospital Israelita Albert Einstein
The constant evolution of technologies has made the environment of the surgical center increasingly technological, making hospital procedures increasingly complex, with the need for guaranteed management processes focused on the excellence of the use of medical technologies.

In this session, we will present the model of the Clinical Engineering of the surgical Center of Hospital Albert Einstein in the last 10 years.
Analysis of satisfaction of the Clinical Engineering team

Fase de Medicação

Adesão

Resultado Geral

Fatores mais Favoráveis
1. Separar ou colaborar
2. Transmissão
3. Clientes e colaboradores

Fatores menos Favoráveis
1. Remuneração
2. Cooperação
3. Mudanças

Questões mais Favoráveis
1. A clínica é um lugar...
2. Conhece e apóia em medicina...
3. Atenção aos pacientes e funcionários...

Questões menos Favoráveis
1. O meu salário está a...
2. Consideras o cargo que exerço...
3. Atualização com o IME...

Comparações Interna (2017)

Comparações Externa (MH 6+)

eNPS

45
58
63

70
11

100
100
100

32
36
46

84%
18%
60%
OUR FOCUS

HUMAN RESOURCES: Resizing people and loads, organization, training

PROCESSES: Structuring of processes to maintain the safety of users and patients (organization, communication, consistency);

TECHNOLOGIES: Mastery of medical needs and technological renewal;

TRAININGS: Development of knowledge multipliers.

Patient and user safety
HUMAN RESOURCES: Team

- EC reports to hospital care board
HUMAN RESOURCES: Team

EC group INSBIO

Coordinator

Supervisor
10 technician
4 assistants

Supervisor
10 technician
4 assistants

Supervisor
5 technicians
STERILIZED MATERIALS CENTER

EC Manager

HOSPITAL

DIAGNOSTIC MEDICINE

Specialist
1 Eng Sr
3 Eng Jr

Leader
6 technicians
2 interns

OR CENTER

HEADQUARTER
Main activities of Clinical Engineering in the Surgical Center

Assistance:
We operate from the planning of equipment for surgeries (map), involving rent and consigned equipment; Supply, configuration, inspection and assembly of equipment in the operating room (check list); Receipt/installation/return of equipment (consigned, rented, loans); Planning and monitoring of surgeries using lasers and neuronavigators; Supply and cleaning equipment; technical support for surgeries; transmission of surgeries and training.

Maintenance
Planning and execution of preventive maintenance (execution, hiring, purchase of parts); Execution/management of corrective maintenance of the entire surgical center base.

Management
Selection, evaluation, testing and acquisition of new technologies Budget management of corrective and preventive maintenance Management of medical technology maintenance contracts Parts planning; maintenance and lease contracts Analysis/investigation of events related to medical technologies Analysis of alerts and recalls related to equipment

And others...
THE TEAM
PROCESS: Safety Huddle

-Daily safety meeting with the Surgical Center, Board and Clinical Engineering
PROCESS: Check list

We carry out structured inspections through a checklist for each procedure.
- Target: 100%
PROCESS: Map

-Daily we hold a meeting to organize the map of equipment to meet the surgeries.
PROCESS: Surgical documentation management

- Archiving all video surgeries in the cloud
**HUMAN RESOURCES: Communication**

- Structured shift change
- Decreased conflicts between shifts

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**QUESTIONÁRIO DE PASSAGEM DE PLANTÃO - ENGENHARIA CLÍNICA BLOCO CIRÚRGICO**

<table>
<thead>
<tr>
<th>Setor:</th>
<th>ID</th>
<th>Questão 1</th>
<th>Questão 2</th>
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Total de cirurgias: | Total de cirurgias realizadas para o TNOA: | Quantas cirurgias estão em andamento: | Total de cirurgias realizadas para o Cache: |

Nome da empresa: | Número da NF / Série | Data da saída de equipamento | Equipamento / Acessório |

Eixpos:

1. O Quadro de ferramentas está completo?  
2. Algum equipamento será enviado para correção?  
3. Algum item identificado em check-list, pendente de correção?  
4. Houve ocorrido durante o plantão (algo que interferiu no andamento da cirurgia)?  
5. Existe pendência de GCM?  
6. Existe algum item a ser descontado?  
7. Existe algum item com procedimento em andamento?  
8. Tese alguma ocorrência nos CMS com recolocação?  
9. Existe alguma cirurgia que receberá apoio da IG/CE?  
10. Existe pendência no PUS de Lâminas de corte?  
11. Existe algum procedimento pendente fora do cirurgiante?  
12. Existe nenhuma cirurgia (excluindo-se o de backup) em andamento? Quais os motivos?  
13. Para procedimento, existe plano do plantão anterior que não foi reportado e devem-se?  

**CHECK LIST**

- Existe sala cirúrgica sem o padrão de bombas?
- Quantos procedimentos foram montados durante o plantão?
- Quantos procedimentos foram montados com CHECK LIST durante o plantão?

Outras observações relevantes:
PROCESSES: Adverse events

- Evaluation of all events related to equipment involving patients

- Collaborative research to find root cause;

- Interview with stakeholders.

- Segregate equipment, accessories and inputs immediately.

- Verification of Cameras in the rooms (if any).

- Evaluation of videos (if video surgery)

- Application of an effective action plan to mitigate the risk of new episodes;

- Notify Anvisa, if applicable.
RESULTS

The level of Clinical Engineering service in the surgical center is measured by quantifying occurrences related to lack, delay and poor functionality of equipment during surgeries, our goal is 97% of procedures without failures.

Clinical Engineering Service Level in the Surgical Center
RESULTS: Preventive maintenance

- Planning started 90 days in advance;
- Start of the month with 100% of orders programmed and distributed to technicians;

**Target:** execution of at least 98% of planned maintenance.
RESULTS: Corrective maintenance, installations e deactivation
Specific results

New technologies with large annual investments; rooms with mobile operating tables; 4K videolaparoscopy systems available fixedly on stands with repeaters monitors; recording of surgeries in the cloud; connected equipment and vital data integrated into the patient's chart, LED surgical lights, high-flow vacuum system, end of electrical extensions, standardization of equipment and processes, complete hybrid room, 2 sterilized material centers with updated equipment, many microscopes, robots and simulators... Life just got easier and surgeries happen more safely.
Thank you!