

WümeK Congress

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Synopsis

High-frequency (HF) surgery has been an established medical technique for around 50 years. Due to changing legislative aspects regarding safety and economy, a response must be made to these new challenges. The BOWA Comfort system provides the best conditions for coping with these new tasks through interdisciplinary support of the user settings and seamless traceability along the entire process chain of a company.

Key words - economy, patient safety, cost optimization, stock holding

Introduction

High-frequency (HF) surgery is an established modern area of application in various medical fields and disciplines. New methods and possibilities have been opened up through the use of HF surgery.

Through the case-based lump sums of the Diagnostic Related Group (DRG), users in the health service are required to use resources effectively. This includes the management of financial and human resources. High-quality treatment of patients offering effective value for money is thus required. Risk minimization is given great status here. In addition to patient safety, the protection of the user is also important. An effective workflow also makes a major contribution to a positive overall result.

In the report below, the BOWA Comfort system, the world's first optimal solution for process safety and process optimization, is described (Fig. 1).

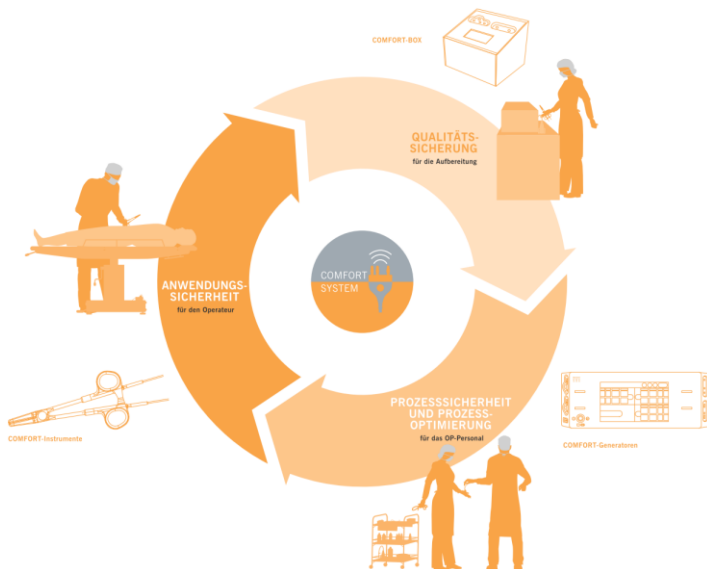


Figure 1: Comfort system (BOWA)

Requirements for a HF system

Today, the requirements for a modern HF system are varied.

These can be divided into three large areas:

- **The operative area**
- **The post-operative area**
- **The administrative area**

Requirements of the operative area

The requirements of the operative area are primarily curative treatment and patient safety. HF surgery is an application method for incising and coagulating biological tissue using high-frequency current, which has been used for many decades. In order to achieve the thermal effect required in HF surgery, an alternating current with a frequency >300kHz is used today, not least to prevent neuromuscular contractions during treatment. (Bergler, 2004), (Lipscomb & Givens, 2010)

Furthermore, it should be taken into consideration that biological tissues are conductive to a greater or lesser extent due to their different electrolyte content. During treatment, the tissue is heated by the electrical current supplied. Temperature distribution and heating depends on the spread during and after the supply of the electrical current and from the conversion of the supplied energy in the tissue. Heating the tissue to around 100°C is not unusual here, and temperatures to over 200°C lead to carbonization. (Hug B, 2006)

A negative effect of such carbonization is the formation of an insulating layer. The consequence is a reduction in thermal conductivity in the tissue so that the thermal effect mentioned above can only make a limited contribution to the success of the treatment. A further negative effect is wound healing, which is delayed by this seriously damaged tissue.

To keep such unwanted effects as small as possible, an optimal choice of parameters in the HF device is indispensable. This is where the Comfort system from BOWA is ideal for the requirements of the operative area. A new standard has been set using cutting-edge radio frequency identification (RFID) technology. The

system consists of a HF generator (e.g. ARC 400) and the Comfort instruments. The instruments used are recognized by the generator through the Plug'n Cut and Comfort function through the cable connector on the device side. This facilitates an interdisciplinary presetting of parameters dependent on the HF instrument used, and settings that are not suitable are prevented in order to rule out an unwanted thermal effect.

At the same time, the user is informed of the exact number of applications that are still available, which the manufacturer validates and guarantees with reference to the preparation. This guarantees that a functionally safe and powerful instrument is always available. This check also means that an instrument that can no longer be used is replaced in good time.

Furthermore, the ARC 400 generators are characterized by an interactive user interface with a touchscreen and the ability to store individual settings on a separate Dr. Dongle (Fig.2). In this way, each user can store his/her personalized settings for patients and use them again and work as usual on any ARC 400 HF generator.

This increases patient safety and effective workflow. Efficiency is also a factor that is not to be underestimated. The full costs of one hour in an operating theater are calculated at around € 600-800. Rapid responses to changes before or during treatment are possible thanks to the intuitive BOWA system. As a consequence, an improved flow of information and, finally, a reduction in operating-theater times is achieved. Optimized operating-theater planning and execution with reduced process times and optimized process safety and quality are possible using this system.



Figure 2: Dr. Dongle (BOWA)

Requirements of the post-operative area

The requirements of the post-operative phase are functional and hygienic.

For smooth operation in the health system, in addition to treatment applications, it is also important that all subsequent steps are well coordinated and tailored to each other. Safe preparation of instruments is significant in this. The usual preparative steps are listed below as an example.

Mechanical preparation is preferred. The reason for this is that process stages during preparation can be validated.

In the first phase, contaminated instruments are cleaned and disinfected in a cleaning and disinfecting machine (CDM). In an initial rinsing step, coarse contamination is rinsed off in this CDM using water at 20°C. Cleaning then ensues using process chemicals. These are generally alkaline with a pH value of 10-14.

Disinfection is measured, assessed and documented using the so-called A_0 . This value has been determined for instruments in the health system at a value of 600 or 3000. The A_0 600 value is demanded for instrument groups with a non-critical risk potential. The A_0 3000 is demanded for instruments assessed as critical. The value of 600 or 3000 means that a temperature of 80°C has to be held for over 600 seconds or 3000 seconds for the purposes of disinfection. The mortality kinetics of the unwanted micro-organisms are exponential. This means that the processing time reduces with an increase in temperature. As water changes its state of aggregation at 100°C, a temperature band between 93-95°C is the rule for mechanical disinfection.

The Comfort instruments by BOWA are characterized by a functional design as well as easy and comprehensible instructions for preparation. A quality standard met by each individual instrument includes easy disassembly, connections in the case of hollow-bodied instruments, and top-quality materials that resist the high stresses of preparation. This guarantees safe preparation of this equipment that can then be validated.

The next step in preparation is inspection and packaging.

In this step, the disinfected instruments are checked for residual deposits and the dismantled instruments are put together by specialists. A

functional check is carried out before packaging in the respective sterile barrier system.

The Comfort instruments by BOWA can be checked by the Comfort Box (Figure 3) and an additional test device for functionality and lifespan. So it is possible even in this process step to identify defective instruments or those that can no longer be used.



Figure 3: Comfort Box (BOWA)

Faulty products and those that have reached the end of their life can be separated out and replaced with new instruments.

Operating-theater times can thus be optimally used and do not have to be unnecessarily delayed due to functional faults that occur in the instruments used during the operation.

A benefit that can be seen when the use of the BOWA Comfort system is compared with that of other manufacturers is the seamless monitoring and documentation of all process steps at all times during use and preparation. Subsequent processes are ideally supported through optimal and simple initial procurement even before the operative phase, and at the end of the day this contributes to a cost reduction.

Requirements of the administrative area

The requirements of the administrative area focus on the structures of the respective course of treatment at the facility.

These are often no longer modern and do not entirely reflect the changed billing environment in the German health system. This means that some matters are not economized effectively.

In order to compensate for this, unnecessary savings are made, such as reducing staff or deferring necessary investments.

However, cost savings and profit optimization are possible through an optimization of the process sequences.

The avoidance of unnecessary duplicate deliveries in specialist departments can result in cost reductions.

An optimized stock holding using just-in-time deliveries or an automated triggering of the order process can reduce the amount of capital commitment. This freed-up capital can now be used elsewhere in the facility. Even the value of the released storage space can be used elsewhere. These advantages and opportunities in the administrative area are taken into account in the Comfort system for HF surgery in that independent and non-manipulable documentation is possible for the instruments. A check is made on the applications still available both during preparation and before actual operative use. Thus the user always has a functionally safe and powerful instrument to hand. Any instrument that can no longer be used or is defective can be replaced in good time.

System durability and rapid availability are the outstanding properties of a modern, effective process chain that adds value, which is achieved through the use of the Comfort system.

In addition, requirements resulting from various legal standards, such as occupational health and safety or hygiene and product safety can be proven seamlessly at any time. This also saves the complex provision of necessary documentary evidence.

Synopsis

The BOWA Comfort system is the world's first universal and interdisciplinary HF surgical system that has instrument identification using RFID technology. Interdisciplinary parameter settings are also possible for universally used standard high-frequency surgical instruments such as monopolar handles or bipolar forceps. This provides optimal patient safety.

The system focuses on the actual needs of the user. Thus just-in-time procurement is possible, which allows a reduction in stock holdings and storage space and, at the end of the day, capital commitment.

Accurate allocation of the costs of consumables to the cost bearer allows accurate billing of the respective DRG.

In addition, preparation costs for each instrument can be accurately determined. The Comfort system by BOWA is thus an innovative and practical means to optimize the value-creation chain in the field of HF surgery.

Literature

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