Electrosurgery

For theatre nurses

Basic proficiency requirements for the safe use of electrosurgery

nivel

EMGO+ Institute for Health and Care Research

VUmc

These proficiency requirements have been determined as a result of the work of the expert group comprising:

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Dear reader,

The proficiency requirements you are looking at have been developed by the NIVEL in collaboration with a number of experts in context of the project “Proficiency of users of medical technology”. The aim of this project is to work for and with the sector in the development of a practical and feasible generic road map to ensure that the users of medical technologies have the required knowledge and skills. An element of this is the development of proficiency requirements for three specific technologies, that is to say electrosurgery, infusion technology and robotic surgery. The proficiency requirements for the use of electrosurgery have been developed for the medical specialist and the theatre nurse, but comparable proficiency requirements also could be developed for other members of the operation team in the future. The version you are reading here is the version for theatre nurses.

The proficiency requirements have been developed during two meetings with an expert group, consisting of a surgeon, a urologist, a gynaecologist, theatre nurse, a clinical physicist and test developers. In the course of this there was collaboration with the TABEE working group of the NVKF which has already developed a similar list at an earlier stage. These proficiency requirements are the minimum proficiency requirements in order to make use of electrosurgery safely. In other words, what someone must be able to do as a minimum in order to be able to work with electrosurgery. The total proficiency of a person or team is more than that which is described by these proficiency requirements but these requirements form the essential basis.

These proficiency requirements can be used in the training of theatre nurse and also for more advanced theatre nurses in order to assess whether their proficiencies are still sufficient. The proficiency requirements can used as part of a training schedule or as part of a test to be taken. These requirements have been produced generically so that they can be adjusted to a local context.

The research team

Basis	
1.1	The theatre nurse can name the advantages and disadvantages of electrosurgery versus other cutting techniques
1.2	The theatre nurse can name why high frequency alternating current is used for electrosurgery
1.3	The theatre nurse can name what the side effects are of high frequency alternating current which is used for electrosurgery
1.4	The theatre nurse can name whether the apparatus may be used (maintenance status)
1.5	The theatre nurse can name that the electrosurgical generator has to be earthed with an extra cable
1.6	The theatre nurse can demonstrate how the electrosurgical generator can be earthed
1.7	The theatre nurse can name that it is necessary to check for kinking in the cables
1.8	The theatre nurse can demonstrate how the apparatus is checked before being used
1.9	The theatre nurse can name what the cause of apparatus overload is
1.10	The theatre nurse can name that (long-term) activation leads to heating up of the active electrode
1.11	The theatre nurse can name the most notable difference between a voltage controlled and a power controlled device
Monopolar/bipolar	
2.1	The theatre nurse can name and explain the difference between monopolar and bipolar electrosurgery
2.2	The theatre nurse can explain the difference in electrical circuits between monopolar and bipolar electrosurgery
2.3	The theatre nurse can name the differences in tissue effect between monopolar and bipolar electrosurgery
2.4	The theatre nurse can name for which applications there is a choice between monopolar and bipolar techniques
Instruments	
3.1	The theatre nurse can demonstrate how instruments should be connected to the equipment
3.2	The theatre nurse can name and explain which materials have to be present and checked in order to use the apparatus safely
3.3	The theatre nurse can name and explain why the active electrode must be put in a safe place when it is not in use
3.4	The theatre nurse can explain the correct type of instrument to use to get the desired tissue effect
3.5	The theatre nurse can name and explain how instruments have to be disconnected
3.6	The theatre nurse can name and explain how the materials have to be stored
Application	
4.1	The theatre nurse can name what the appropriate settings are for the specific application to the patient
4.2	The theatre nurse can demonstrate how the settings can be modified
4.3	The theatre nurse can explain what the mechanism behind vessel sealing is
4.4	The theatre nurse can explain the difference between the different techniques
4.5	The theatre nurse can demonstrate the different techniques

4.6	The theatre nurse can name what the correct steps to take are when the effect which is being aimed at is not attained
4.7	The theatre nurse can explain how the peak voltage and pause changes with different signals
4.8	The theatre nurse can explain what the display shows
4.9	The theatre nurse can explain what auto start and stop mean
4.10	The theatre nurse can demonstrate how the auto start and stop can be switched on and off
	Patient plate
5.1	The theatre nurse can name that the patient plate is not neutral
5.2	The theatre nurse can name how the patient plate is used safely
5.3	The theatre nurse can name and explain what is a suitable dimension of the patient plate
5.4	The theatre nurse can name and explain what the optimal position is for the patient plate
	Tissue effect
6.1	The theatre nurse can explain what the effects on the tissue are of the different cutting and coagulation signals
6.2	The theatre nurse can name and explain that different effects occur with different tissue types
6.3	The theatre nurse can explain the tissue effect with enlarging of the contact surface between the active electrode and the tissue
6.4	The theatre nurse can name and explain how electricity leads to an increase in temperature of the tissue
6.5	The theatre nurse can name and explain how adhesions and carbonisation can be prevented as much as possible
	Minimally invasive surgery
7.1	The theatre nurse can explain why the application of electrosurgery with minimally invasive procedures deserves special attention
7.2	The theatre nurse can explain what the most frequent risks of electrosurgery in minimally invasive surgery are
7.3	The theatre nurse can explain what the undesired effects of insulation damage are and how this can be prevented
7.4	The theatre nurse can explain what the risk of a high voltage signal is
7.5	The theatre nurse can name that an electrode may not be activated when adjacent to or in direct contact with another instrument
7.6	The theatre nurse can explain the concept of capacitive coupling
7.7	The theatre nurse can describe which configuration of trocars and instruments pose the greatest risk on capacitive coupling
7.8	The theatre nurse can name the preventive measures to be taken to prevent burns as a consequence of residual heat
	Risks
8.1	The theatre nurse can name and explain how malfunctions are to be dealt with
8.2	The theatre nurse can name and explain how it can be checked that the patient touches no conductive objects
8.3	The theatre nurse can name and explain how to deal with the presence of a metal implant, tattoo or piercing

8.4	The theatre nurse can name and explain the fire triangle
8.5	The theatre nurse can name and explain that all alcohol-based material has to be dried off before electrosurgery can be applied
8.6	The theatre nurse can name and explain how measures against surgical smoke can be taken
8.7	The theatre nurse can name and explain how surgical smoke can be limited as much as possible