

Electrosurgery

For medical specialists

*Basic proficiency requirements for
the safe use of electrosurgery*



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

Dr. J.P. van Basten (CWZ) on behalf of NVU
Drs. H.O. ten Cate Hoedemaker (UMCG) on behalf of NVvH
Dr. ir. I. de Boer (HagaZiekenhuis) on behalf of NVKF
A representative of LVO
Dhr. P.J.M. van Kesteren (OLVG, location East) on behalf of NVOG

We would also like to thank Noordhoff Health and LeQuest for their collaboration during the expert group's meetings

The following were involved on behalf of the NIVEL

Mrs. P.J. Porte, MSc
Mrs. L.M. Verweij, PhD
Prof. Dr. C. Wagner

NIVEL

Postbus 1568 | 3500 BN Utrecht | www.nivel.nl | nivel@nivel.nl
t 030 2 729 700 | f 030 2 729 729

EMGO+ Instituut / VUmc

Van der Boerhorststraat 7 | 1081 BT Amsterdam | www.emgo.nl
t 020-4448384

©2017 NIVEL en EMGO+ Instituut

These proficiency requirements are a publication of NIVEL and EMGO. The data may be used with a reference to the source. (P.J. Porte, L.M. Verweij, J.P. Van Basten, H.O. ten Cate Hoedemaker, I de Boer, P.J.M. van Kesteren, C. Wagner. Electrosurgery for medical specialists, basic proficiency requirements for the safe use of electrosurgery. Utrecht/Amsterdam: NIVEL/EMGO+, 2017).

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 nurses, 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 medical specialists.

The proficiency requirements have been developed during two meetings with an expert group, consisting of a surgeon, a urologist, a gynaecologist, a 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 medical specialist and also for more advanced medical specialists 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 medical specialist can name the advantages and disadvantages of electrosurgery versus other cutting techniques
1.2	The medical specialist can name why high frequency alternating current is used for electrosurgery
1.3	The medical specialist can name what the side effects are of high frequency alternating current which is used for electrosurgery
1.4	The medical specialist can name whether the apparatus may be used (maintenance status)
1.5	The medical specialist can name that the electrosurgical generator has to be earthed with an extra cable
1.6	The medical specialist can name that it is necessary to check for kinking in the cables
1.7	The medical specialist can name what the cause of apparatus overload is
1.8	The medical specialist can name that (long-term) activation leads to heating up of the active electrode
1.9	The medical specialist knows the most notable difference between a voltage controlled and a power controlled device
Monopolar/bipolar	
2.1	The medical specialist can name and explain the difference in operation between monopolar and bipolar in electrosurgery
2.2	The medical specialist can explain the difference in electrical circuits between monopolar and bipolar electrosurgery
2.3	The medical specialist can name the differences in tissue effect between monopolar and bipolar electrosurgery
2.4	The medical specialist can name for which applications there is a choice between monopolar and bipolar techniques
Instruments	
3.1	The medical specialist can demonstrate how instruments are to be connected to the equipment
3.2	The medical specialist can name and give reasons why the active electrode must be put in a safe place when this is not in use
3.3	The medical specialist can explain the correct type of instrument to use to get the desired tissue effect
Application	
4.1	The medical specialist can name what the appropriate settings are to the specific application for the patient
4.2	The medical specialist can explain what the mechanism behind vessel sealing is
4.3	The medical specialist can explain the difference between the different techniques
4.4	The medical specialist can demonstrate the different techniques
4.5	The medical specialist can name what the correct steps to take are when the effect which is being aimed at is not attained
4.6	The medical specialist can explain how the peak voltage and pause changes with different signals
4.7	The medical specialist can explain what the display shows

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

8.6	The medical specialist can name that all alcohol-based material have to be dried off before electrosurgery can be applied
8.7	The medical specialist can name how measures against surgical smoke can be taken
8.8	The medical specialist can name how surgical smoke can be limited as far as possible
8.9	The medical specialist can name that glove deterioration can occur in particular at a high peak voltage