

## Recommendations by the Quality Task Group (74)

# Transmission Instruments Hand and Angled Pieces and Turbines – Part 1

**T**ransmission instruments are used in dentistry as well as in oromaxillofacial surgery, ear, nose and throat (ENT) medicine, neurosurgery, hand surgery and plastic surgery. These are instruments that transmit the energy (power) of the drive unit to the instrument directly used on the patient, e. g. a drill.

The terms employed for transmission instruments such as hand and angled piece, turbine and drive unit are not clearly defined and are used differently in everyday language. In this Recommendation these terms are employed as follows:

### *Hand and angled pieces*

**Handpieces** are straight implements that are fitted onto the drive unit. The handpiece has a collet (also called «collet chuck») into which different rotating or oscillating instruments are fitted depending on the task performed.

**Angled pieces**, unlike handpieces, are angled implements fitted to the drive unit.

In general hand and angled pieces have electrically operated drive units. There are designs with and without irrigation channels

### *Turbines*

Like hand and angled pieces, turbines have a collet into which rotating or oscillating instruments are fitted. In general, turbines have compressed-air-operated drive units and a higher rotational speed. The compressed air is emitted directly into the surgical area.

Another feature that differs among transmission instruments is the choice of media (air/water), which can be supplied internally as well as externally.

Transmission instruments amenable to automated cleaning and disinfection comply with the state of the art.

When used on a patient, it is not only the external surfaces but also the channels that are contaminated. This contamination can be due to reflux or to the use of contaminated irrigation solution. It can contain saliva or other secretions, blood, dental plaque or bone meal and microorganisms. Reflux is more likely to account for contamination of turbines. One study based on the ortho-phthaldialdehyde (OPA) method detected proteins in the range 28 µg – 386 µg [1].

In general transmission instruments are made of stainless steel, aluminium and titanium, with many other materials being used internally. Some systems have light cables. Therefore the manufacturer's reprocessing instructions must definitely be observed. Because of their design, method of use, as well as subsequent use, and potential contamination, e. g. with blood and other secretions, transmission instruments must be classified into the Critical B category pursuant to the recommendation by the Robert Koch Institute (RKI) and the Federal Institute for Drugs and Medical Devices (BfArM). Based on this RKI/BfArM Recommendation [2], medical devices belonging to the → **CRITICAL B** category must in principle be reprocessed using an automated procedure, i. e. each time they are used on a patient they must be cleaned and thermally disinfected in a washer-disinfector and then sterilised after having been subjected to a functional test and packed. Specially for dental instruments the RKI/BfArM Recom-



Fig. 1: Hand piece GP 10 LP 1

Factory photo KaVo



Fig. 2: Angled piece GP 20 LP

Factory photo KaVo

→ **TRANSMISSION INSTRUMENTS (CRITICAL B CATEGORY)** must in principle be reprocessed using an automated procedure.

→ **INSTRUMENTS USED FOR SURGICAL, PERIODONTOLOGIC OR ENDODONTIC PROCEDURES** should be packed and sterilised.

→ **WD LOADING RACKS** must be tailored to the requirements, i. e. they must permit decontamination of the external and internal surfaces.

→ **CORRECT CONNECTION** within the WD must be ensured.

→ **CLEANLINESS OF THE CHANNELS** can be verified using the semi-quantitative biuret method.

→ **LUBRICATION OF THE INSTRUMENTS** is carried out before packaging and sterilisation.

mentation stipulates that those instruments used for → **SURGICAL, PERIODONTOLOGIC OR ENDODONTIC PROCEDURES** with subsequent saliva-impermeable wound closure should be packed and sterilised [3].

Washer-disinfectors (WDs) with validated processes as per DIN EN ISO 15883-1 and -2 must in principle be used for cleaning and disinfection. If transmission instruments are cleaned and disinfected in alternative systems, a validated process must be used and the same performance requirements met.

The → **WD LOADING RACKS** must be tailored to the specific requirements, i. e. they must permit decontamination of the external and internal surfaces of transmission instruments, if this has been prescribed by the manufacturer, i.e. if there are no channels, then there will be no contamination of internal surfaces when the instrument is used.

The instruments must be securely → **CONNECTED** within the WD. Filters must be installed to prevent cleaning solution particles from blocking the irrigation channels. Transmission instruments must be allowed to cool down after withdrawing them from the WD. The channels must be checked for patency, using any adjuncts recommended to that effect by the manufacturer (adapter, care oil, etc.). Since → **CLEANLINESS OF THE CHANNELS** cannot be verified through visual inspection, the semi-quantitative biuret method (EN ISO 15883-1) should be carried out as a routine procedure. Residues can be recovered using a solvent or a swabbing method. The detection limit is set at around 30 µg protein.

Alternatively, qualitative tests can also be used to detect haemoglobin or proteins. No guide value or limit value has been defined here. These test methods are very sensitive, with even 1 µg protein showing a colour reaction and thus a positive result.

Next a lubricant is applied to the instrument in accordance with the manufacturer's reprocessing instructions. Any excess → **OIL** must be removed. The instrument is then packed for sterilisation in a class B small steriliser or in a large steriliser using a pulsed vacuum process.

Drive systems are not dealt with in this Recommendation.

## References

- [1] Kontamination und Aufbereitung zahnärztlicher Übertragungsinstrumente sowie rotierender Instrumente. *aseptica* 2009; 1: 3–6.
- [2] Anforderungen an die Hygiene bei der Aufbereitung von Medizinprodukten. *Bundesgesundheitsbl.* 2001; 44: 1115–1126.
- [3] Infektionsprävention in der Zahnheilkunde – Anforderungen an die Hygiene. *Bundesgesundheitsbl.* 2006; 49: 375–394.
- [4] Guideline Compiled by the DGKH, DGSV and AKI for Validation and Routine Monitoring of Automated Cleaning and Disinfection Processes for Heat-Resistant Medical Devices as Well as Advice on Selecting Washer-Disinfectors. *Central Service* 2007, Supplement 2.