

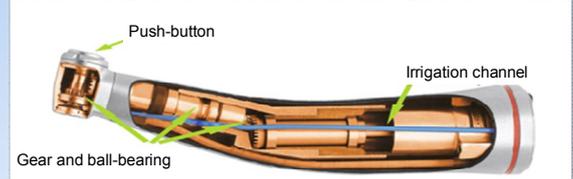
## INTRODUCTION

Dental handpieces (HPs) can be **contaminated** internally from environment through of a **back suction** created by the deceleration of the turbine. Microbial contamination of these HPs has been highlighted [1] and could be a **potential source of patient to patient infection**.

As HPs are sophisticated devices with combination of precision parts, the cleaning process to remove soils is challenging. The **influence of a latency time** before cleaning is also unknown.

**A recent study in French healthcare settings [2] has shown different practices of cleaning:**

- manual disinfection (11%)
- use of automaton (27%)
- use of washer disinfector (32%)
- combination of methods (30%)



**OBJECTIVE** of this study is to find the best method to clean HPs and to assess the influence of latency time between use and cleaning.

## METHODS

○ Heads of 10HPs are artificially contaminated by 50µL of human blood (3750-4200µg of protein/HP). Positive control has been contaminated in the same way but not cleaned and the negative control HP have not been contaminated.

○ Drying time before cleaning (T° ambient) : 15 min / 2 h / 24 h

○ Different cleaning method : - Manual cleaning (MC)  
- Washer disinfector \* (WD)  
- Automaton \*\* (A)

○ Each HP was immersed in 20ml of SDS 1% and ultrasonicated 10min / 35 KHZ.

○ The BCA method (Clean- Trace™) was used to detect the residual protein concentration and calibration of Clean- Trace™ with human blood in 20ml SDS 1% was performed.

Clean- Trace™ calibration	Color
<150 µg/HP	Green
150-750 µg/HP	Grey
750-3750 µg/HP	Purple
>3750 µg/HP	Dark Purple

We considered a HP not clean if color changed, traducing more than 150µg of protein residue/HP.

## RESULTS

Drying time	MC		WD		A	
15 min	Green	Green	Green	Green	Green	Green
	Green	Green	Green	Green	Green	Green
	Green	Green	Green	Green	Green	Green
	Green	Green	Green	Green	Green	Green
2 h	Green	Green	Green	Green	Green	Green
	Green	Green	Green	Green	Green	Green
	Green	Green	Green	Green	Green	Green
	Green	Green	Green	Green	Green	Green
24 h	Green	Green	Green	Green	Green	Green
	Green	Green	Green	Green	Green	Green
	Green	Green	Green	Green	Green	Green
	Green	Green	Green	Green	Green	Green
Control	+	-	+	-	+	-

## DISCUSSION

○ The German Society of Sterile Supply (DGSV) and AKI specified a guide value of < 100µg of protein per HP. Most of the HP were not clean following this recommendation .

➔ Does the limit of 100µg/HP is too low ?

➔ Does some HPs are more suitable for cleaning than other ?

○ The influence of drying time is observed when manual cleaning is processed and drying time of 2 h seems to be not different than 24h.

○ Clean Trace™ based on BCA method is a semi-quantitative method. Easy to use, Clean Trace™ allow to assess a cleaning process.

○ In this experimental protocol heads HPs are contaminated with 400µg/ protein per instrument → probably higher than contamination usually found after clinical use

## CONCLUSION

○ **Manual cleaning is not an efficient method to clean HPs and should be discouraged.**

○ **Washer disinfector compliant with ISO 15883 perform the best results of cleaning.**

○ **Automaton are suitable alternative if performances are assessed and demonstrated.**

1. SMITH G, SMITH A. Microbial contamination of used dental handpieces. Am J Infect Control. sept 2014;42(9):1019-21.

2. H. PLUCHART, C. LAMBERT, P. ROCHER, L. MARTIN, H. NEY, B. BAUNE, D. COMBEAU, L. BRISSET, M. LAURENT, JM KAISER. Enquête dans les établissements de santé sur le retraitement des portes instruments dynamiques en odontologie. JNES 2015, Nantes.

\* Miele G7828, Module E919+AVF

\*\* GAMASONIC DYNASEPT®