

# EXPERIENCE WITH TUNNELLED CENTRAL VENOUS CATHETERS IN OUR HAEMODIALYSIS PATIENTS (2007–2017)

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## INTRODUCTION

- The optimal vascular access for chronic haemodialysis (HD) is the arteriovenous fistula (AVF). There is not always sufficient time for creating an AVF, and thus the patient arrives for dialysis therapy without having a vascular access.
- Our patients drawn into the survey have spent an average four years in renal replacement therapy by the year of the observation. Thus, if the possibilities for creating an AVF are exhausted, a temporary or permanent solution may be provided by the use of tunnelled central venous catheters (TuC).
- In the United States 60–82 % of incident HD patients start with a catheter. Up to 33 % of patients in Canada are dialysing with tunnelled catheters.
- Initially we performed the TuC placements exclusively with the help of image amplification devices, while since 2015 ultrasonography has also been available for us to facilitate puncture of the vein.

## PATIENTS, METHOD

Between 2007 and 2017 we performed 387 TuC implantations in 275 patients in our centre. In 61 patients the TuC was the primary access, while in 214 cases the patient had previously received treatment in a peritoneal dialysis (PD) or haemodialysis (HD) program [through an arteriovenous fistula (AVF)]. We compared the effect of first vascular access on patients' survival.

## RESULT



### AVERAGE AGE, GENDER DISTRIBUTION AND SURVIVAL OF THE PATIENTS

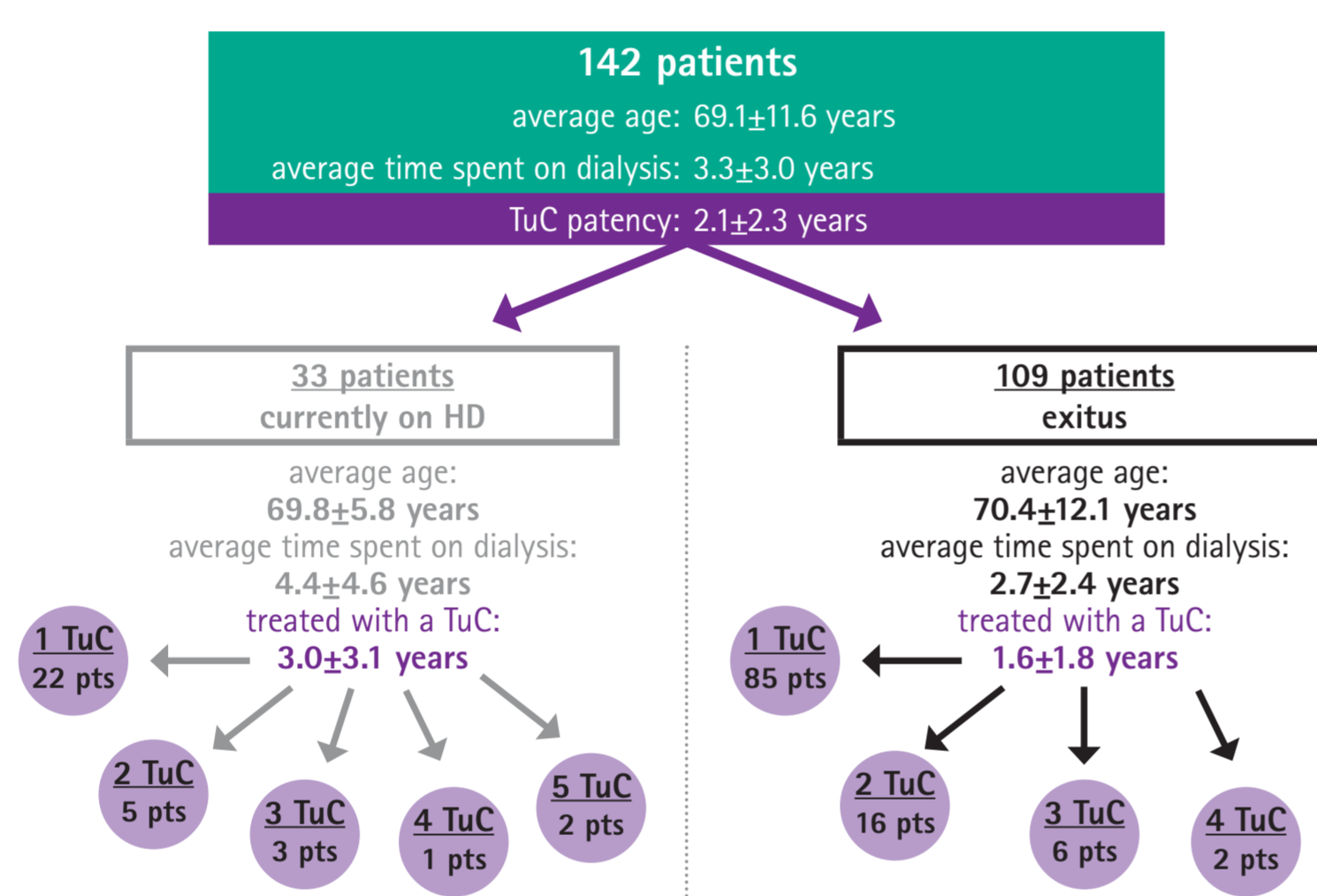
	patients	average age at start of dialysis (years)	all average time spent on dialysis (years)	time spent on dialysis of which treated with a PC (years)
all patients	275	68.4±12.9	4.0±4.0	2.8±6.6 70%
women	180	68.1±12.9	3.8±3.8	2.4±2.8 63%
men	95	66.6±13.0	4.1±3.6	2.7±2.8 66%

### DISTRIBUTION OF TUNNELLED CATHETERS ACCORDING TO THE NUMBER OF PLACEMENTS

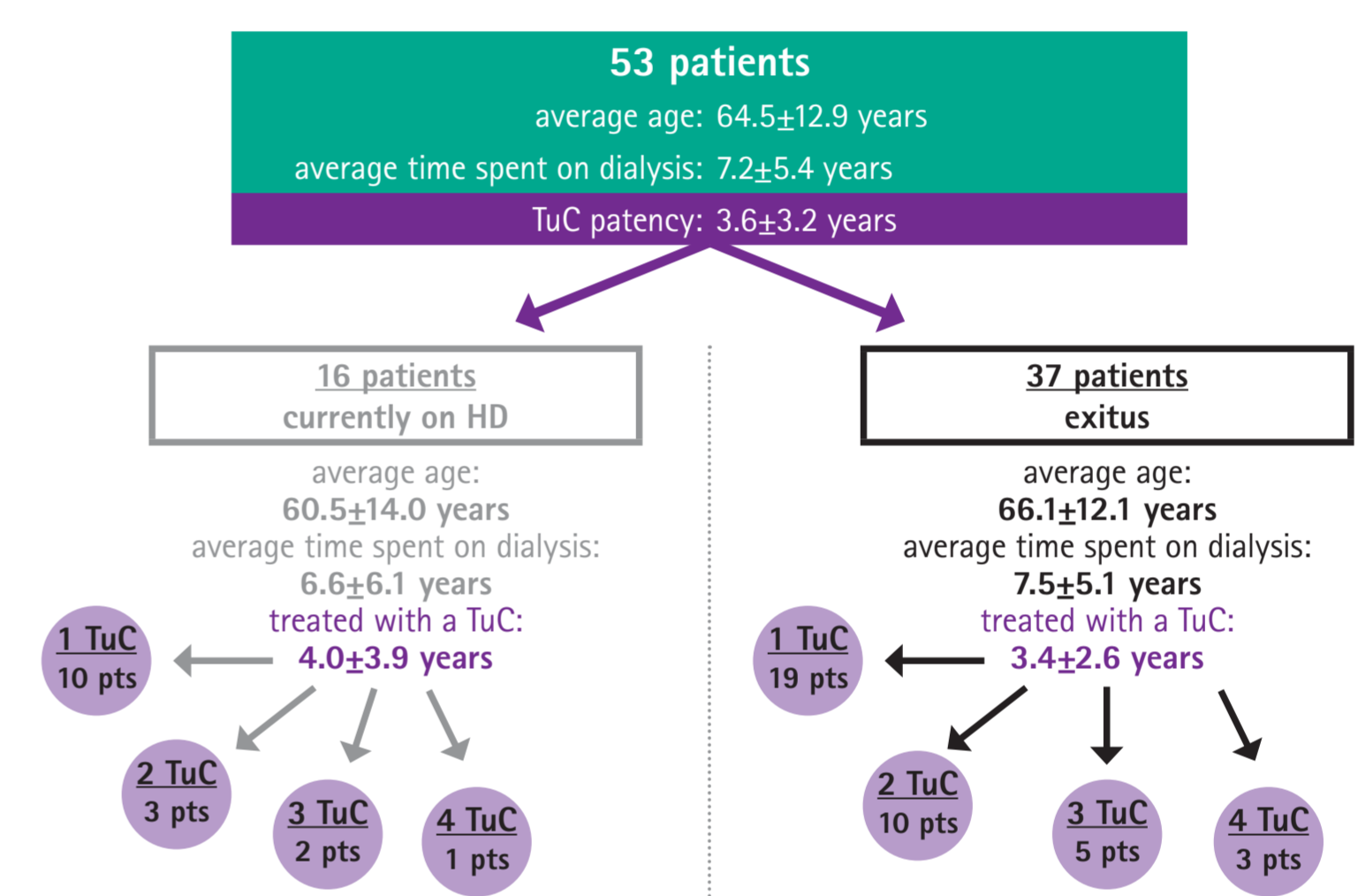
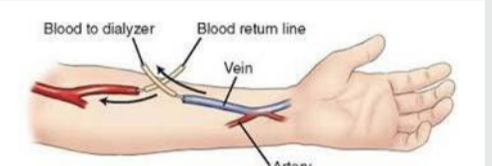
the number of implanted PC	275 case	average age at start of dialysis (years)	all average time spent on dialysis (years)	time spent on dialysis of which treated with a PC (years)
1	195	69.3±13.0	2.8±2.8	1.6±1.4 57%
2	48	63.7±13.2	5.6±4.1	4.4±3.9 78%
3	21	62.0±12.8	7.8±4.2	5.4±3.0 69%
4	8	58.8±10.6	9.8±4.6	7.4±1.8 75%
5	3	52.8±14.1	11.4±2.1	10.1±0.7 88%

### EVOLUTION OF THE FATE OF PATIENTS STARTING WITH A TEMPORARY CATHETER (TC)

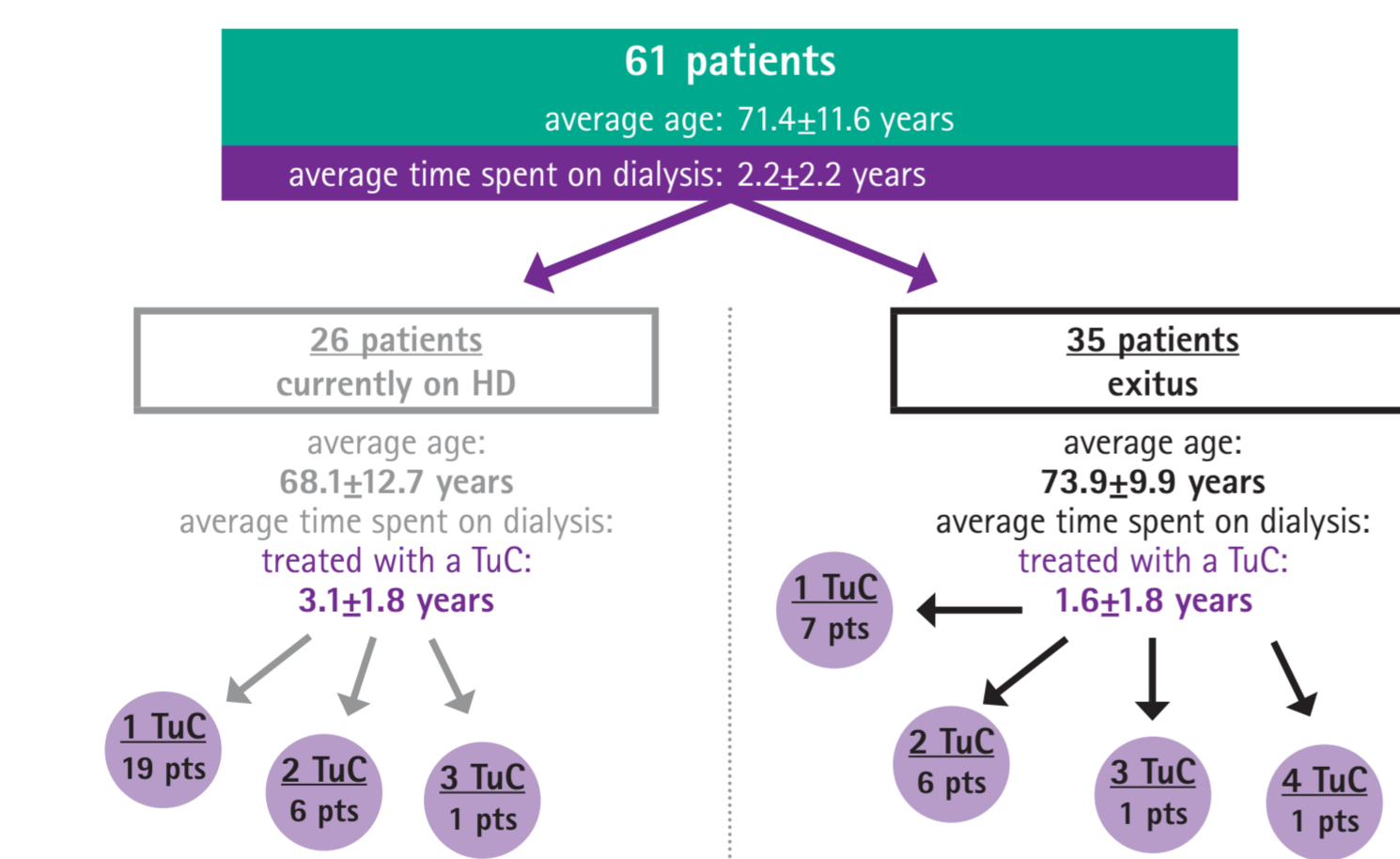
not-planned initiation



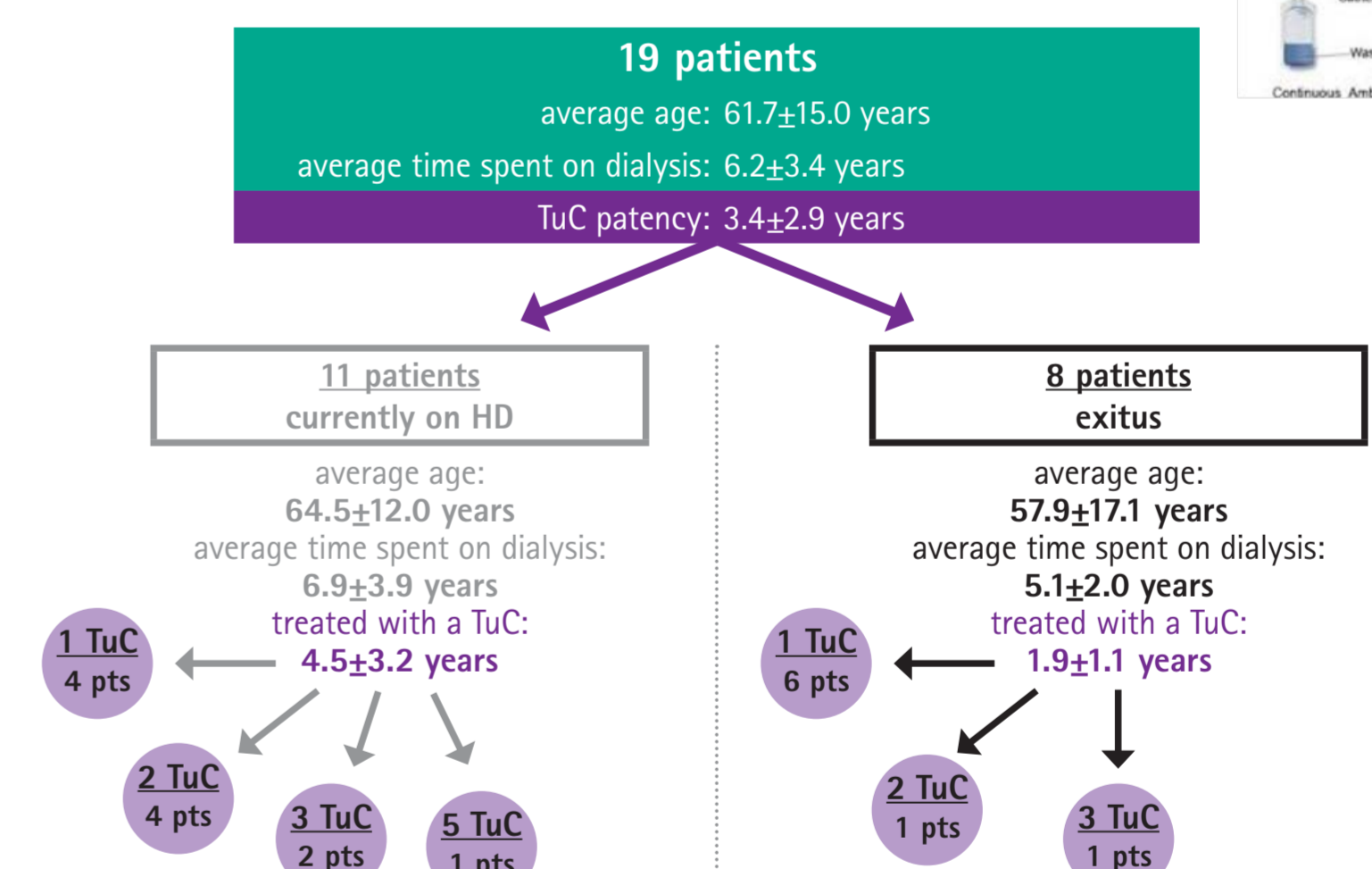
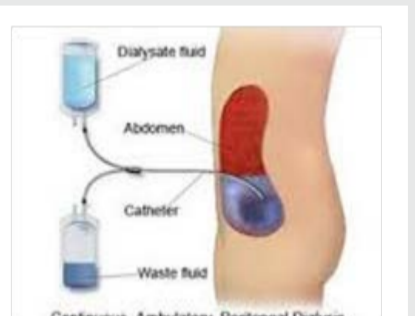
### EVOLUTION OF THE FATE OF PATIENTS STARTING WITH AN ARTERIOVENOUS FISTULA (AVF)



### EVOLUTION OF THE FATE OF PATIENTS STARTING WITH A PRIMARY TUNNELLED CATHETER (TuC)



### EVOLUTION OF THE FATE OF PATIENTS TREATED THROUGH A PRIMARY TUNNELLED CATHETER (TuC) FROM PD



166 PATIENTS HAD NO INFECTION (60.4%)  
In 109 patients (39.6%), infection was observed on a total of 299 occasions

patients	infection
47	1
20	2
16	3
8	4
3	5
3	6
7	7
0	8
2	9
1	10
2	11

18 PATIENTS  
132 INFECTIONS

### DISTRIBUTION OF TUNNELLED CATHETERS ACCORDING TO THE NUMBER OF PLACEMENTS

the number of implanted TuCs	275 case	average age at start of dialysis (years)	all average time spent on dialysis (years)	time spent on dialysis of which treated with a TuC (years)
1	195	69.3±13.0	2.8±2.8	1.6±1.4 57%
2	48	63.7±13.2	5.6±4.1	4.4±3.9 78%
3	21	62.0±12.8	7.8±4.2	5.4±3.0 69%
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### INCIDENCE OF TuC INFECTIONS BETWEEN 2007 AND 2017

number	exit site		tunnel		blood stream		total infection	
	cases	patient month	cases	patient month	cases	patient month	cases	patient month
163	-	0.87	46	9296	90	9296	299	9296
case / 1000 patient day	-	-	-	0.21	-	0.50	-	1.07

Because of an early complication (insufficient blood flow) we had to change the TuC within one month in 13 cases.  
Other early complications (infection, haemorrhage, arrhythmia, vein perforation, injury of surrounding organs) were not observed.

## SUMMARY

- In our patients requiring haemodialysis treatment, the creation of an AVF is rendered increasingly difficult because of their vascular status.
- More than half of our new ESRF patients arrive for chronic HD programme without vascular access, in emergency situation; thus, for them the use of a tunnelled central venous catheter represents a temporary or permanent solution.
- Currently the use of tunnelled central venous catheters is an indispensable prerequisite of HD treatment.
- A basic prerequisite of their use is catheter placement under aseptic surgical conditions and, even more so, the highly trained nurse staff.
- All operations of the technological process are important: the indication of insertion, the technique of catheter implementation, the careful care in everyday practice, the close observation and immediate intervention in case of a failure.
- Data shows the well known superiority of AVF, but for the patients whose only choice is the TuC, we can prolong survival by 2.2 years unadjusted.