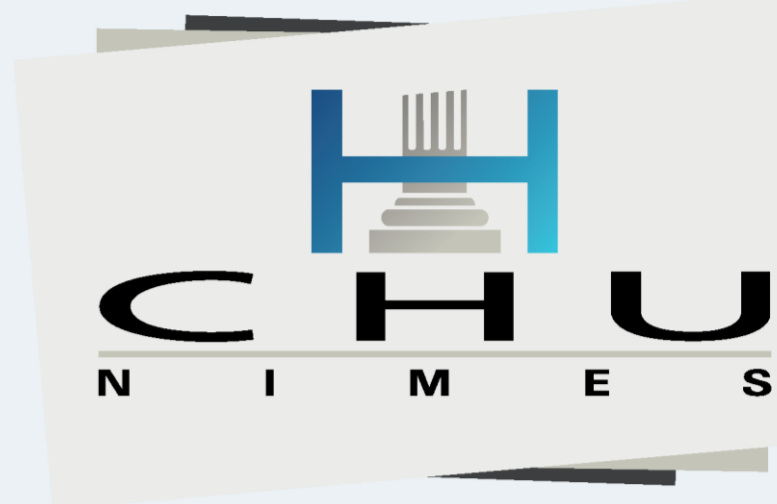


Tandem hemodialysis and DFPP: Procedure, safety and cost-effectiveness in patients requiring chronic hemodialysis and lipid apheresis

O Moranne^{1,2} | F Chauvel¹ | E Pambrun¹ | P Ahmadpoor¹ | C Prelicean¹ | A Wuillai³ | S Chkair^{2,4} | Z Messikh¹



J Clin Apher. 2022;1-13. doi:10.1002/jca.22005



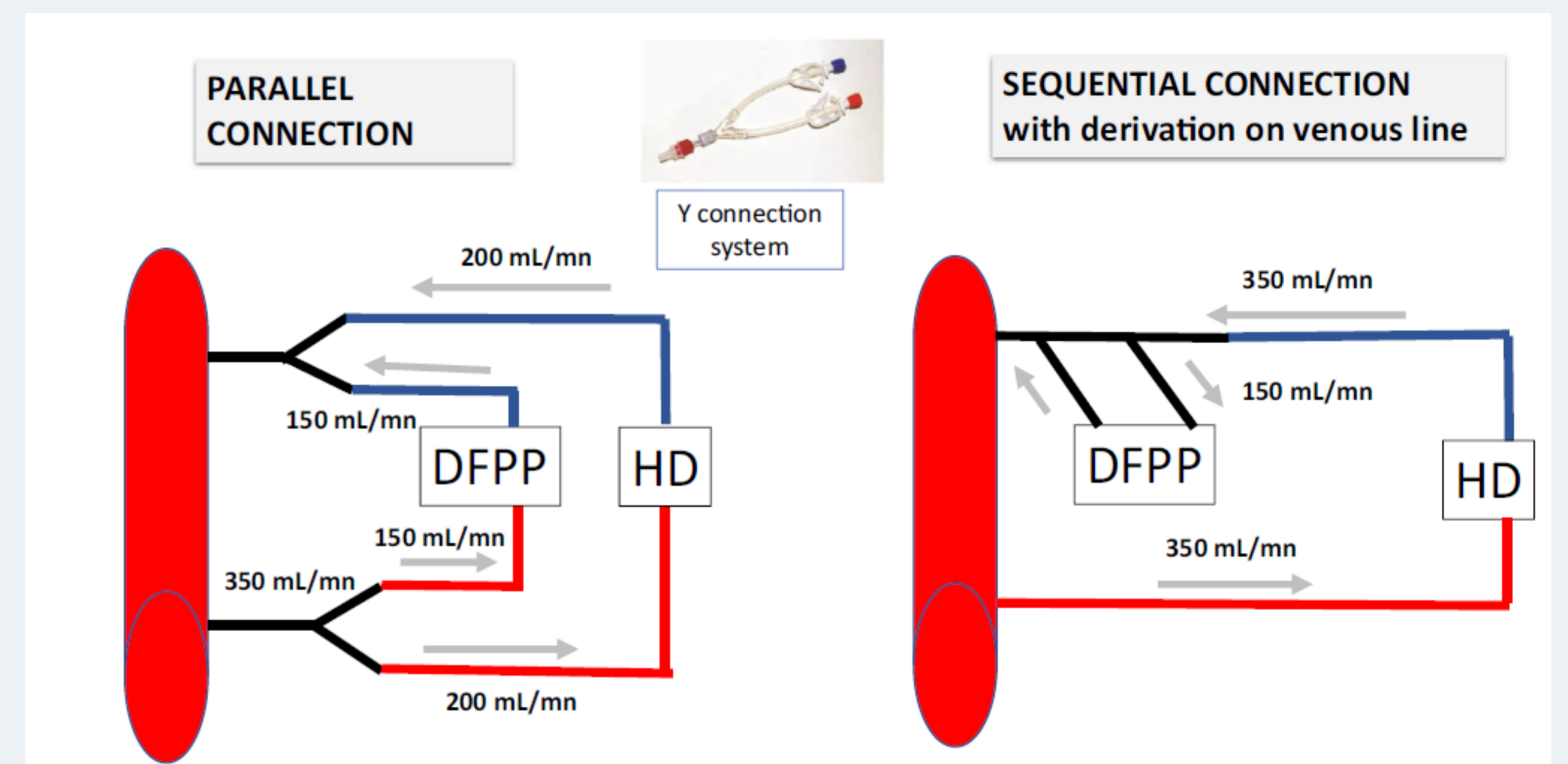
Introduction

Introduction: Certain patients require simultaneous lipoprotein apheresis (LA) and intermittent hemodialysis (HD). Instead of undergoing 2 consecutive treatment sessions, a double filtration plasmapheresis (DFPP) and HD tandem procedure could be offered to reduce treatment times and costs. Our study evaluated the performance, safety and cost of this tandem procedure.

Matériel et méthode

Material and Methods: Three patients underwent 168 HD and DFPP tandem sessions in a tertiary center from August 2018 to November 2020, using a Fresenius 5008 generator for HD and an InfomedHF440 for DFPP. The system's efficacy was assessed by lipid subtraction performance for DFPP. Efficacy of 2 blood line connection configurations (parallel or sequential) was compared in terms of Kt/V and matched against an HD control session for each patient. Clinical and biological safety and the differential cost between tandem and consecutive procedures were evaluated.

	Patient no.1	Patient no.2	Patient no.3
Age (years)	66	72	58
Sex	M	W	W
BMI (kg/m ²)	33.5	22.4	25.5
Diabetes	Type 2	No	No
Etiology of the nephropathy	Diabetes	Nephroangiosclerosis	Nephroangiosclerosis
Indication for DFPP	Hypertriglyceridemia with relapsing pancreatitis	Hypertriglyceridemia with relapsing pancreatitis	Heterozygous Familial Hypercholesterolemia
Frequency of the DFPP session with tandem	Every week	Every 2 weeks	Every week



Résultats

Patients	Patient no.1 tandem n = 55 sessions				Patient no.2 tandem session n = 61 sessions				Patient no.3 n = 35 sessions			
	Tandem parallèl	HD control	Tandem sequential	HD control	Tandem parallèl	HD control	Tandem sequential	HD control	Tandem parallèl	HD control	Tandem sequential	HD control
Session per group: n (%)	20	20	35	35	22	22	39	39	13	13	22	22
Hemodialysis session												
Median session time (min)	239 [232, 240]	240 [240, 240]	240 [240, 240]	240 [240, 240]	240 [233, 240]	234 [232, 235]	240 [240, 240]	234 [232, 235]	240 [240, 240]	234 [231, 235]	240 [240, 240]	235 [232, 235]
Weight before session	92.6	92.9	93.3	93.9	61.7	62.0	62.7	62.8	61.9	62.0	59.0	59.5
Median IQ (kg)	[91.6, 93.3]	[92.3, 93.6]	[92.4, 95.1]	[93.0, 96.3]	[61.1, 62.1]	[61.4, 62.6]	[61.9, 63.3]	[62.3, 63.7]	[60.9, 62.0]	[61.1, 62.3]	[57.7, 61.4]	[58.1, 61.8]
Ultrafiltration (mL), Median IQ	1870 [1200, 2500]	4121** [3632, 4327]	2400 [2100, 3000]	4000** [3500, 4200]	500 [300, 622]	1079** [700, 1423]	700 [340, 1100]	1050** [600, 1450]	1200 [1080, 1600]	1300 [1200, 1400]	981 [820, 1300]	1280* [800, 1600]
Weight variation (kg), Median IQ	-1.3 [-0.5, -1.6]	-4.0** [-3.6, -4.1]	-1.6 [-1.3, -2.5]	-3.9** [-3.3, -4.1]	0.3 [0.4, -0.1]	-0.6* [-0.3, -1.0]	0.4 [0.7, -0.3]	-0.5* [-0.2, -1.1]	-0.5 [-0.2, -0.6]	-1.0** [-0.9, -1.0]	0.1 [0.1, -0.3]	-0.9 [-0.6, -1.2]
Arterial Blood flow	200 (tandem)	300	350	350	200 (tandem)	380	380	380	200 (tandem)	360	360	360
During tandem and/or HD	380 (HD)	[300, 325]	[350, 380]	[350, 350]	360 (HD)	[380, 400]	[350, 400]	[360, 390]	360 (HD)	[350, 360]	[350, 380]	[350, 380]
Kt/V by OCM [±] , Median IQ	1.0 [0.9, 1.1]	1.2** [1.1, 1.3]	1.3§ [1.2, 1.4]	1.3 [1.3, 1.3]	1.5 [1.5, 1.6]	2.1** [2.0, 2.2]	2.0§ [1.9, 2.2]	2.1 [2.0, 2.2]	1.6 [1.4, 1.7]	2.1** [2.0, 2.2]	2.1§ [2.0, 2.3]	2.3 [2.1, 2.3]
N missing data	7	0	1	1	6	1	0	4	2	4	3	3
DFPP session												
Blood flow (mL/min)	206 [183, 218]		199 [193, 206]		182 [161, 210]		190 [174, 194]		171 [154, 182]		178 [163, 184]	
VPT (L)	4.5 [4.5, 5.0]		4.5 [4.5, 5.0]		3.6 [3.5, 3.6]		3.6 [3.3, 3.8]		3.0 [3.0, 3.0]		3.0 [3.0, 3.0]	
VPT (mL/kg)	50 [50, 56]		50 [50, 56]		59 [57, 59]		59 [54, 62]		51 [51, 51]		51 [51, 51]	
Plasma flow (mL/min)	42 [36, 45]		39 [36, 41]		36 [31, 43]		35 [33, 39]		35 [32, 36]		34 [32, 38]	
Plasma blood ratio (mL/min)	19 [18, 21]		18 [16, 20]		19 [18, 20]		18 [16, 19]		18 [17, 19]		19 [17, 20]	
Device arterial pressure (mmHg), Median IQ	-151 [-176; -130]		16 § [-67; -17]		-130 [-141; -59]		16§ [14, 17]		-97 [-107; -77]		15§ [11, 16]	
Device venous pressure (mmHg), Median IQ	120 [95; 132]		131§ [119, 141]		83 [67, 90]		113§ [100, 125]		158 [150, 167]		164 [134, 169]	

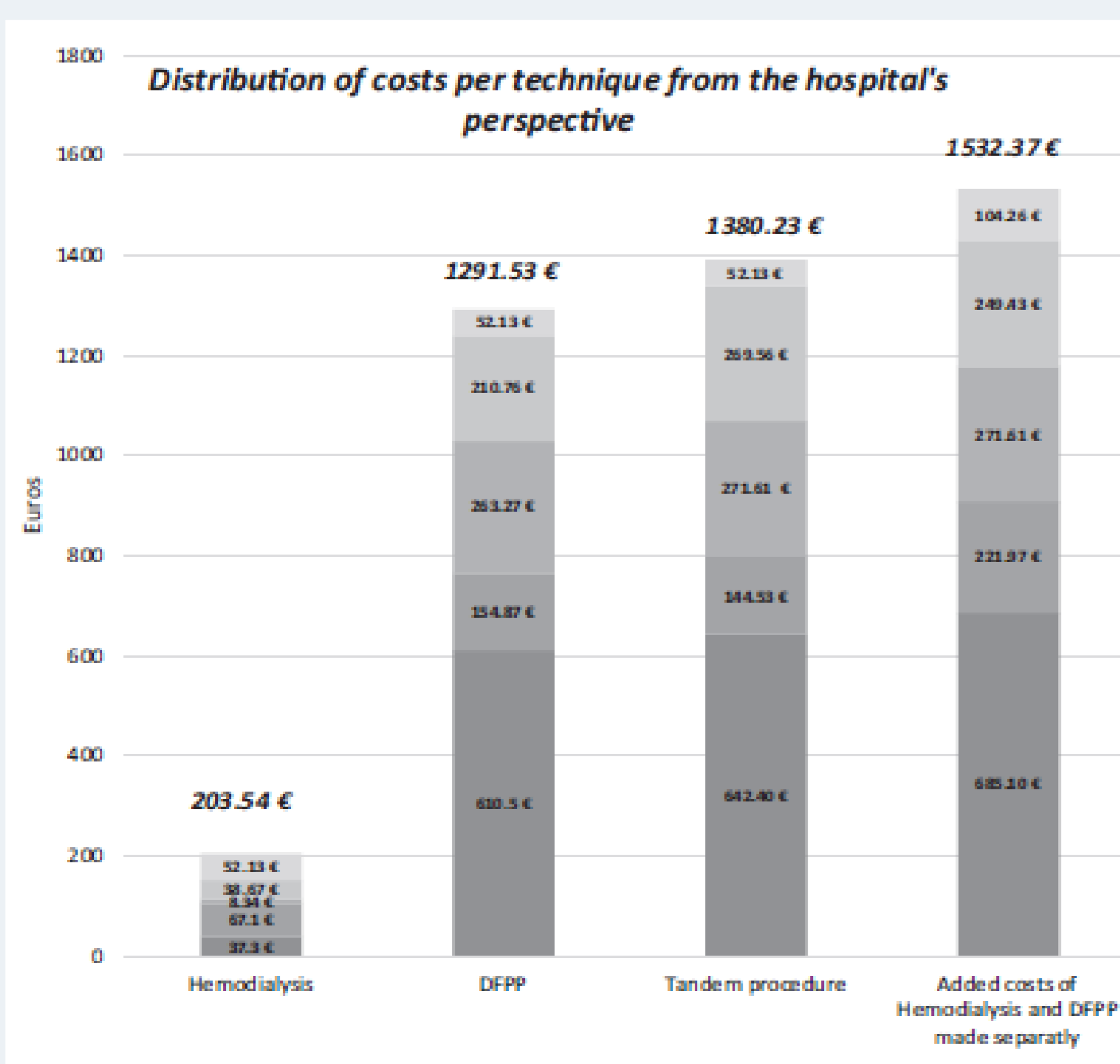


FIGURE 2 Cost of different systems from the hospital's perspective

Conclusion: HD-DFPP tandem with a sequential blood line connecting system (derivation installed on the HD venous line) is effective and well-tolerated with a good cost-benefit ratio. Tandem reduces hospitalization and treatment session times and can be offered to patients requiring simultaneous HD and DFPP.