Time to Move
INTERNATIONAL TRANSPLANTOUX SYMPOSIUM

GREX
Global Renal EXercise

Lessons from Sustained Exercise Programs in CKD

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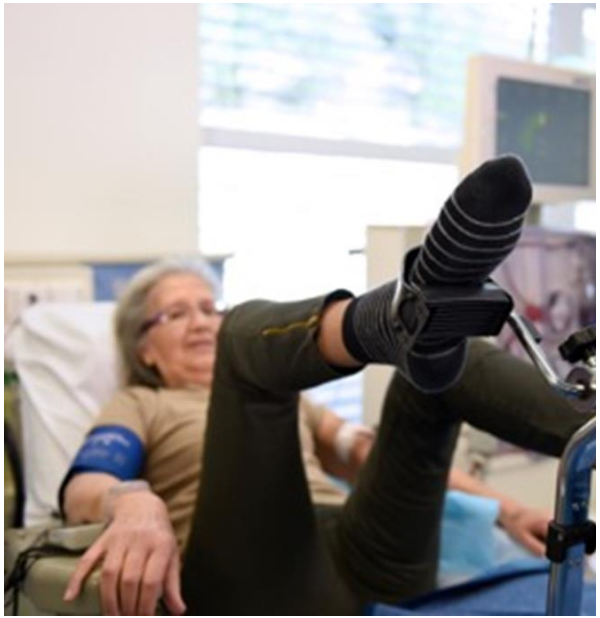
NephroCare Portugal intradialytic exercise programme

Programa de Exercício Físico

PEF

NephroCare



NephroCare Portugal intradialytic exercise programme

- 3-months pilot project in a single unit
- NC Portugal Executive and Medical boards supported expansion
- National exercise program coordinator
- Local exercise program coordinators (dialysis staff)
- MSc internship programme (exercise science students)

NephroCare Portugal intradialytic exercise programme

Exercise training protocol

AEROBIC EXERCISE TRAINING

Borg Scale

Rating	Perception of exertion
6	No exertion
7	
8	
9	
10	
11	Light
12	
13	Somewhat hard
14	
15	Hard (heavy)
16	
17	Very hard
18	
19	
20	Maximal exertion

Warm Up: 5 min

Conditioning: up to 60 min (50-70 rpm)

Cool Down: 5 min

NephroCare Portugal intradialytic exercise programme

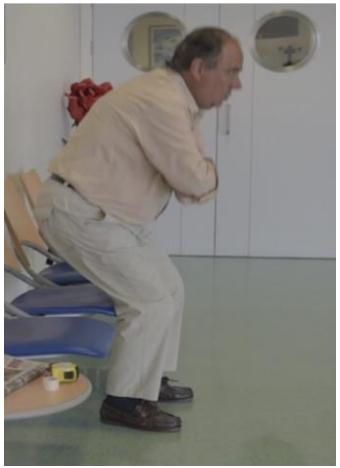
Exercise training protocol

RESISTANCE EXERCISE TRAINING

1-4 sets; 12 repetitions

NephroCare Portugal intradialytic exercise programme

Assessments – physical function



STS 5 & STS 30

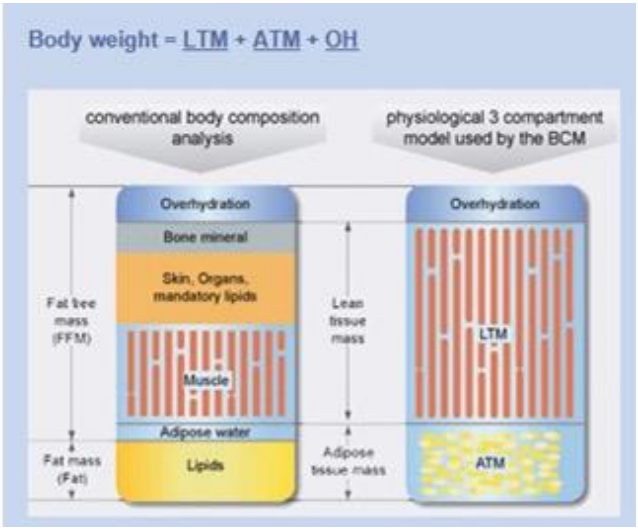
8-foot Up and Go

Single Leg Stance

Handgrip strength

NephroCare Portugal intradialytic exercise programme

Assessments – body composition



Intradialytic exercise in hemodialysis patients: from clinical implementation evaluation to the long-term effects on patient outcomes

1. To examine the long-term implementation of an intradialytic exercise program (IEP), using the RE-AIM framework (Reach, Effectiveness, Adoption, Implementation and Maintenance)

2. To explore the relationship between participation in long-term IEP and mortality risk, hospitalization risk and kidney transplantation eligibility

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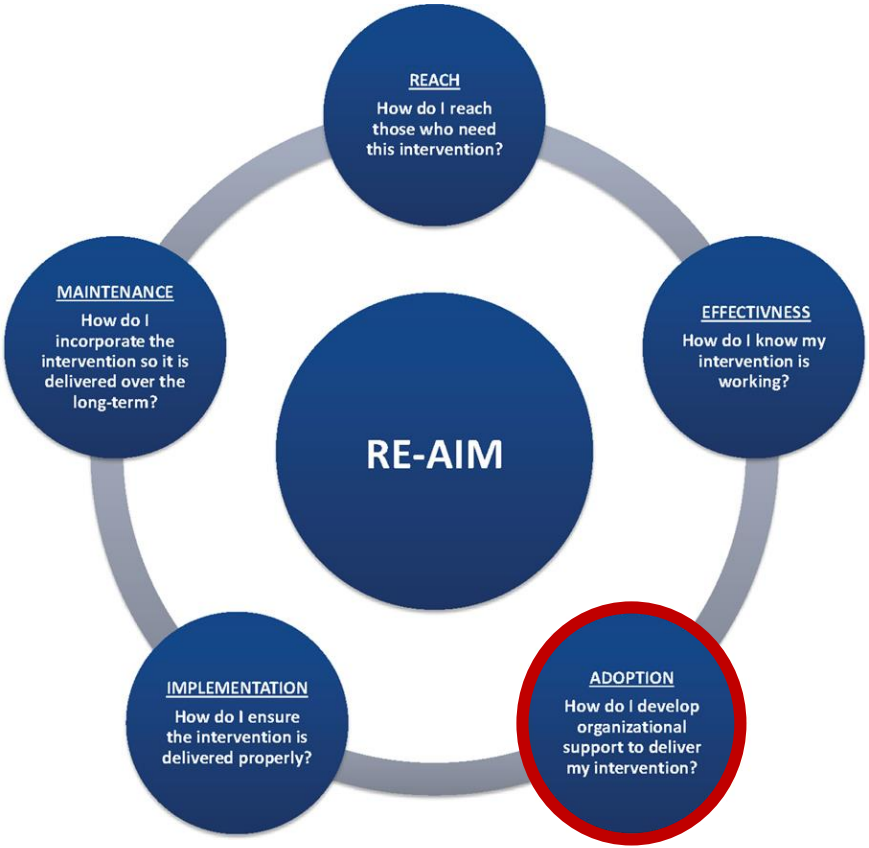
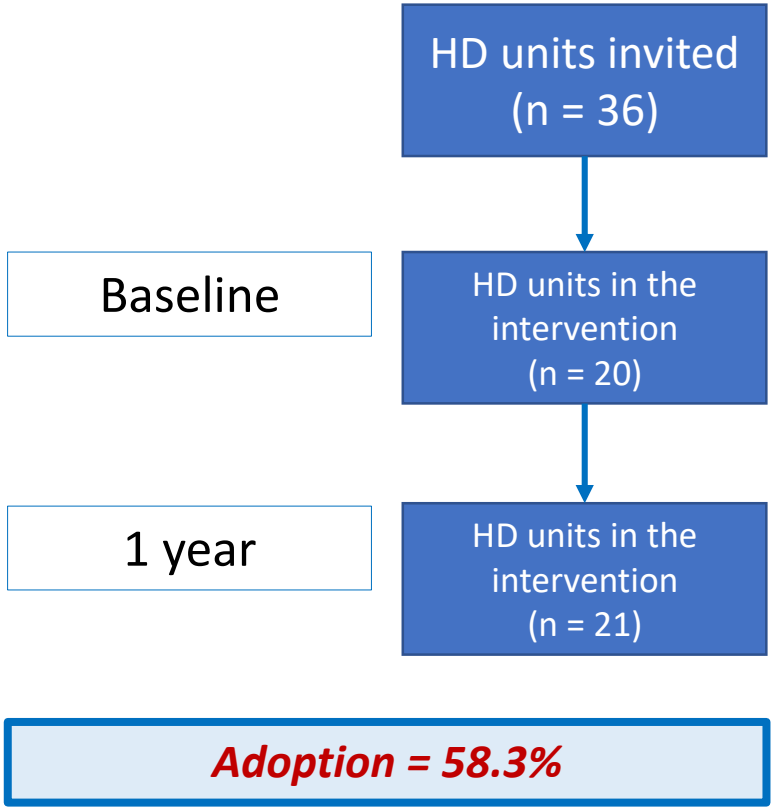
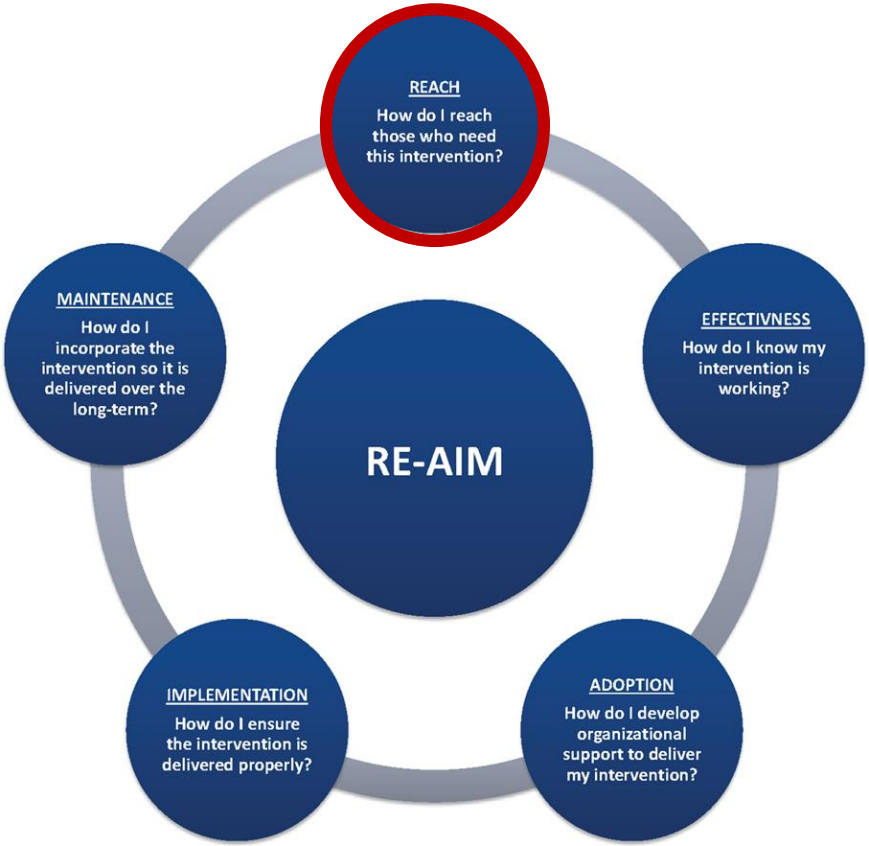
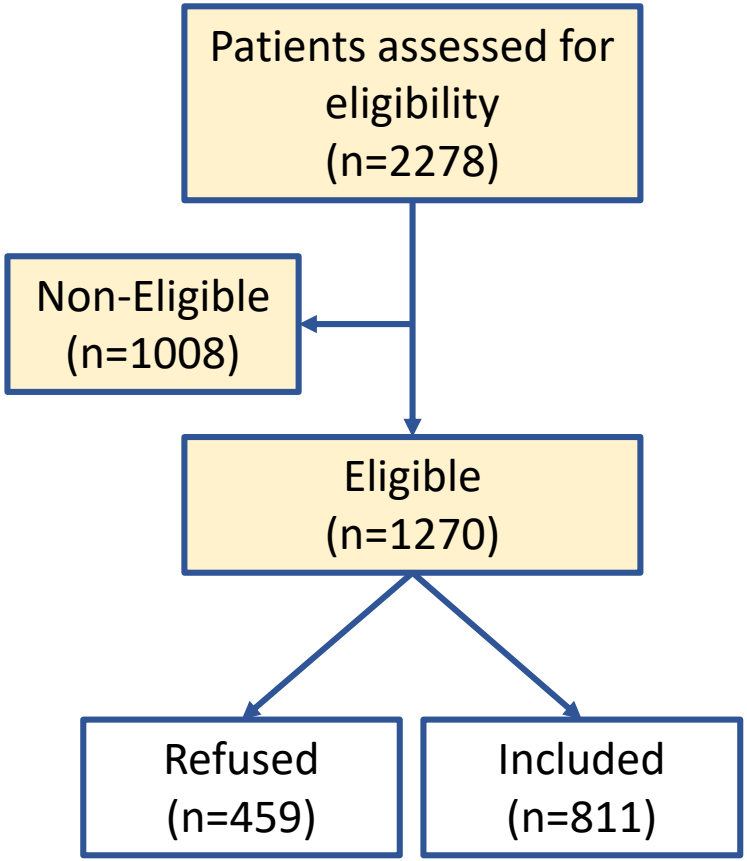




Martins et al., unpublished





Martins et al., unpublished

Reasons for non-eligibility

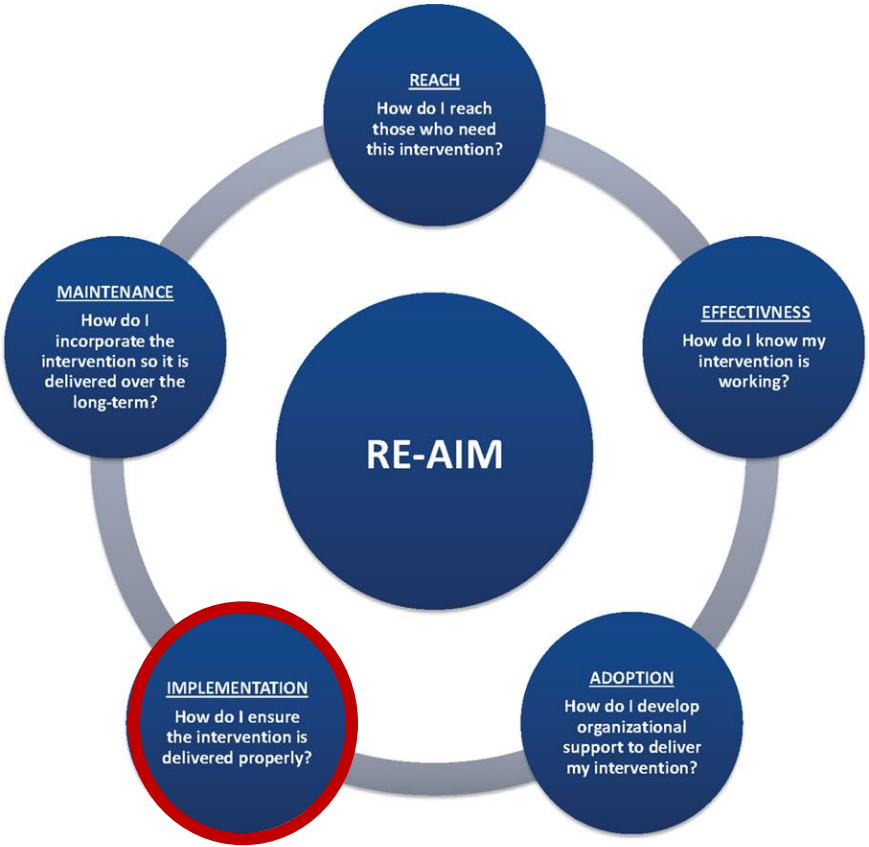
Reason	n	%
Vascular access in the lower limb	24	2.4
Risk of vascular access hematoma	39	3.9
Cardiovascular risk	352	34.9
Physical/cognitive incapacity	512	50.8
Other/unknown	81	8
Total	**1008**	**100**

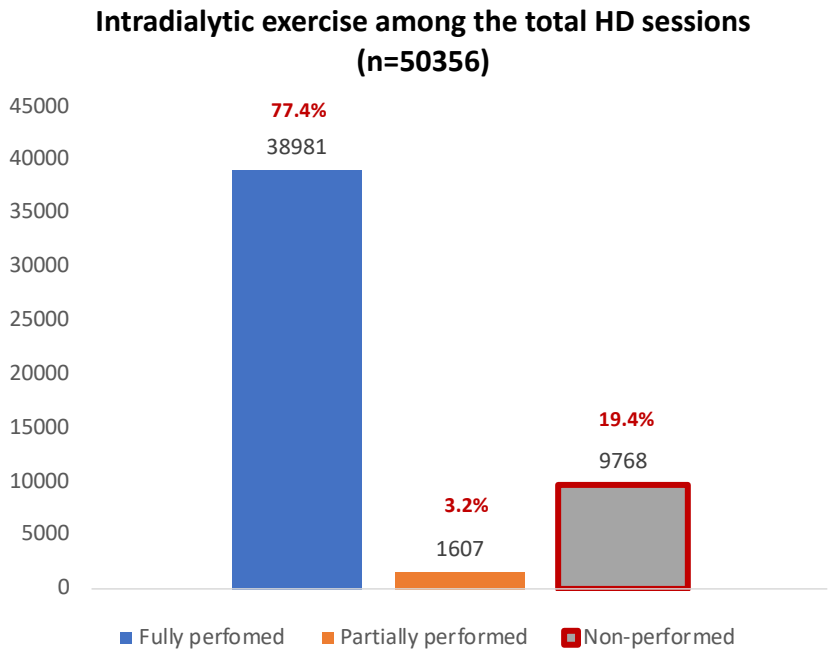
Martins et al., unpublished

Included vs Refused

		N	Included (n=811)	N	Refused (n=459)	p
	Age (y)	811	61.3±14.6	459	64.4±14.6	**<0.001**[1]
	Female, n (%)	811	303 (37.4)	459	162 (35.3)	0.463[3]
Vascular access, n (%)	AVF AVG CVC	811	676 (83.4) 84 (10.4) 51 (6.3)	459	344 (74.9) 47 (10.2) 68 (14.8)	**<0.001**[3]
Treatment modality, n (%)	Hemodiafiltration Hemodialysis	807	760 (94.2) 47 (5.8)	432	402 (93.1) 30 (6.9)	0.436[3]
	Dialysis vintage (months), median (IQR)	800	41 (64)	454	56 (94)	**<0.001**[2]
Comorbidities	Age-adjusted Charlson comorbidity index	811	5.3±2.4	454	5.9±2.5	**<0.001**[1]
	Diabetes Mellitus, n (%)	811	221 (27.3)	459	114 (24.8)	0.348
	Cardiovascular disease, n (%) No. of cardiovascular diseases, median (IQR)	811	630 (77.7) 1.6±1.5	459	392 (85.4) 2.0±1.8	**0.001**[3] **<0.001**[1]
Body composition	Lean Tissue Index (Kg/m^2) Fat Tissue Index (Kg/m^2)	784	13.3±3.4 12.2±5.6	427	12.9±3.3 12.1±5.6	**0.035**[1] 0.663[1]

Martins et al., unpublished





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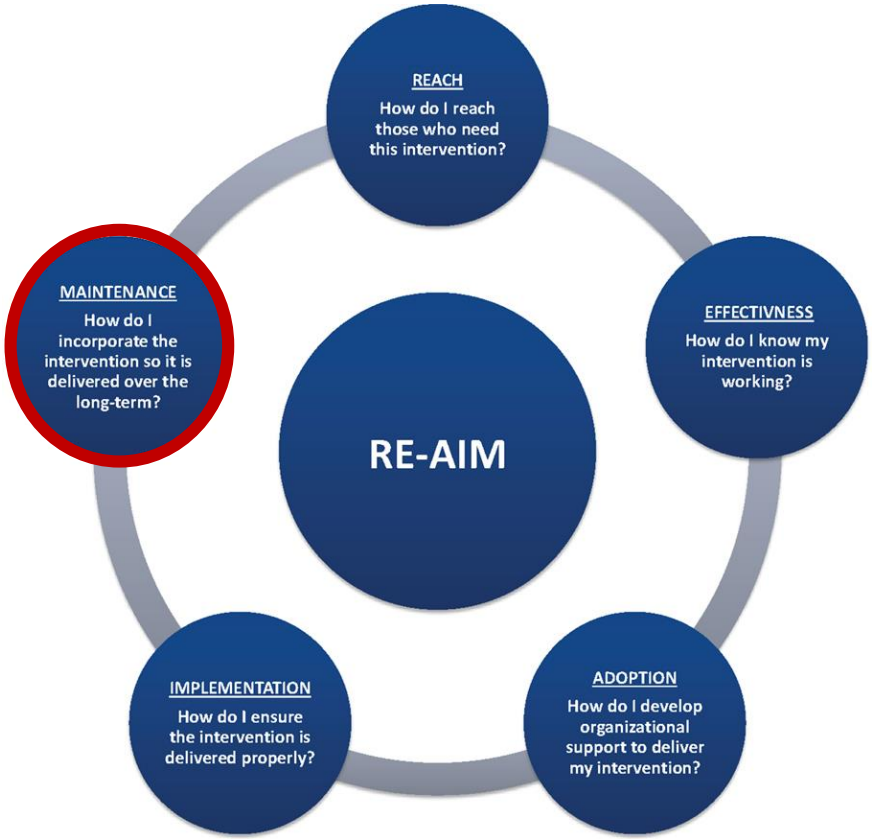

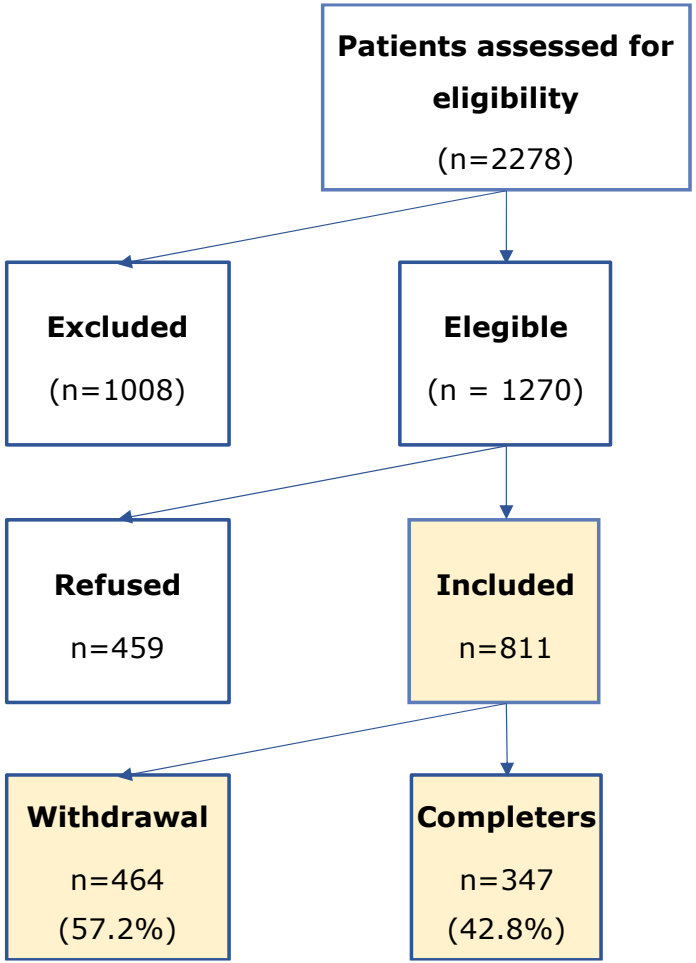

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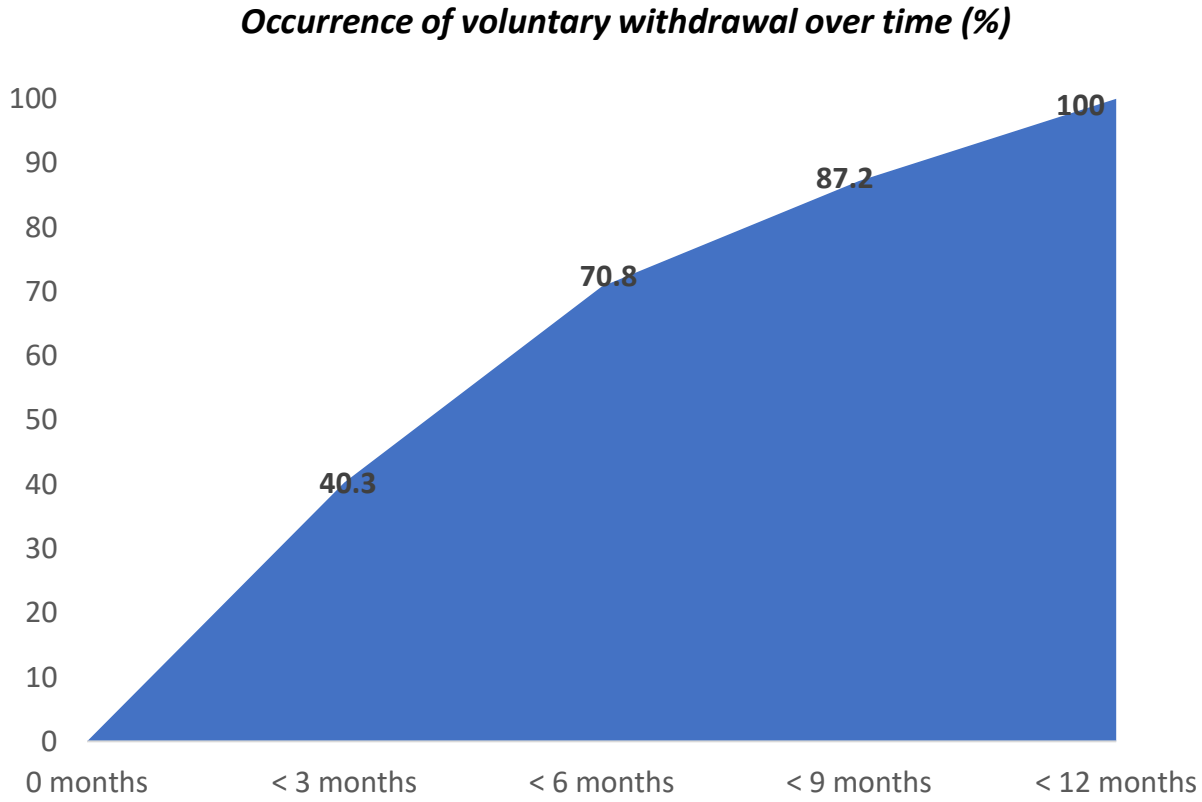
Martins et al., unpublished


Occurrence of voluntary withdrawal over time (%)
100
90
80
70
60
50
40
30
20
10
0
40.3
70.8
87.2
100
0 months
< 3 months
< 6 months
< 9 months
< 12 months

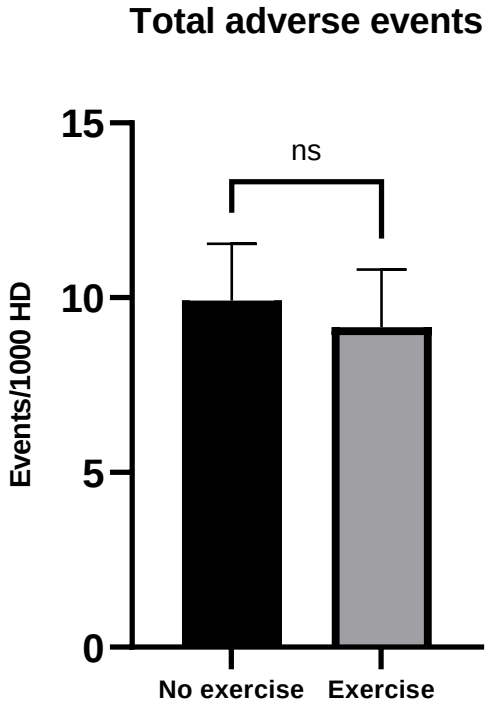
Safety

Physical function

Martins et al., unpublished

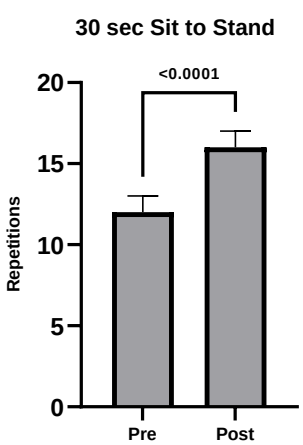
Safety

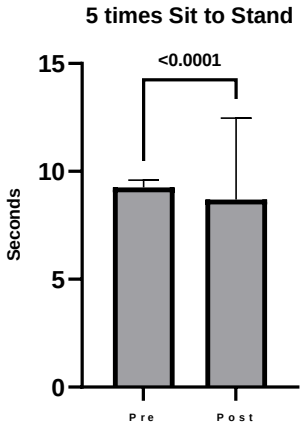
Cramps
Headache
Needle displacement/dislodgement
Dyspnea
Dysrhythmia
Abdominal pain
Chest pain
Fatigue
Hypertension
Hypotension
Nausea/vomiting
Syncope
Hypoglycemia (diabetics)

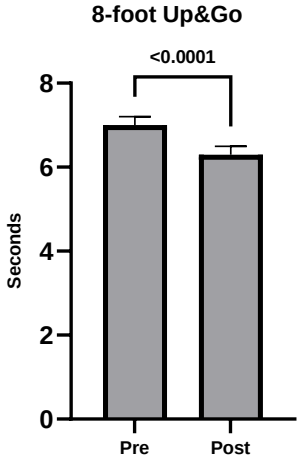


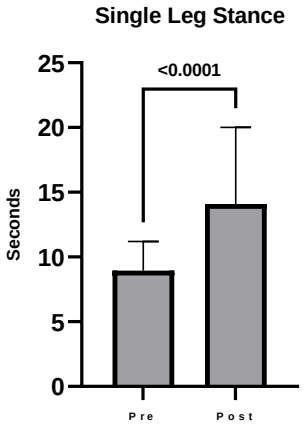
Martins et al., unpublished

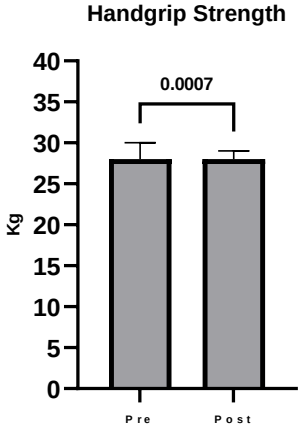
Physical function







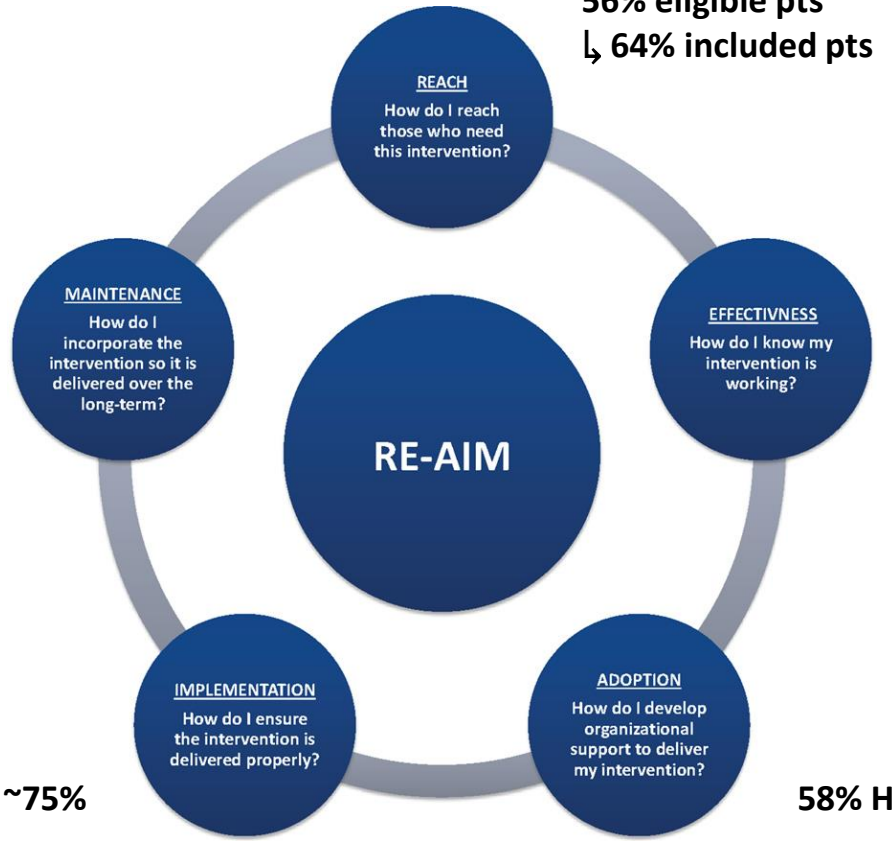




Martins et al., unpublished

RE-AIM 1 year

56% eligible pts
↳ 64% included pts



Drop out
0% HD units
57% Patients
↳ 52% Voluntary

Safe
↑ Physical Function

Exercise Adherence ~75%

58% HD units

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EXERCISE AND PHYSICAL ACTIVITY IN DIALYSIS PATIENTS

Seminars in Dialysis WILEY

Guest Editors: Paul Bennett, Kenneth R. Wilund and Stephanie Thompson

Sustained exercise programs for hemodialysis patients: The characteristics of successful approaches in Portugal, Canada, Mexico, and Germany

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Abstract

Despite having good intentions, hemodialysis (HD) clinics often fail to sustain exercise programs that they initiate. There are many reasons for this, including a lack of funding, inadequate training of the clinic staff, a lack of exercise professionals to manage the program or train the staff, and the many challenges inherent to exercising a patient population with multiple comorbid diseases. Despite these barriers, there are several outstanding examples of successful exercise programs in HD clinics throughout the world. The aim of this manuscript is to review the characteristics of four successfully sustained HD exercise programs in Portugal, Canada, Mexico, and Germany. We describe the unique approaches they have used to fund and manage their programs, the varied exercise prescriptions they incorporate, the unique challenges they face, and discuss the benefits they have seen. While the programs differ in many regards, a consistent theme is that they each have substantial and committed support from the entire clinic staff, including the nephrologists, administration, nurses, dietitians, and technicians. This suggests that exercise programs in HD clinics can be successfully implemented and sustained provided significant effort is made to foster a culture of physical activity throughout the clinic.




Practical tips for nephrologists

- Exercise programs in dialysis clinics are best implemented and sustained if managed by exercise professionals (physical therapist, physiotherapist, kinesiologist, exercise physiologist).
- Simple exercise programs can be successfully implemented by the existing clinic staff with sustained encouragement from the clinic managers and nephrologists.
- Exercise programs at clinics should promote both intradialytic and out-of-clinic exercise.
- Web-based and local community resources should be explored to develop and support hemodialysis exercise programs.

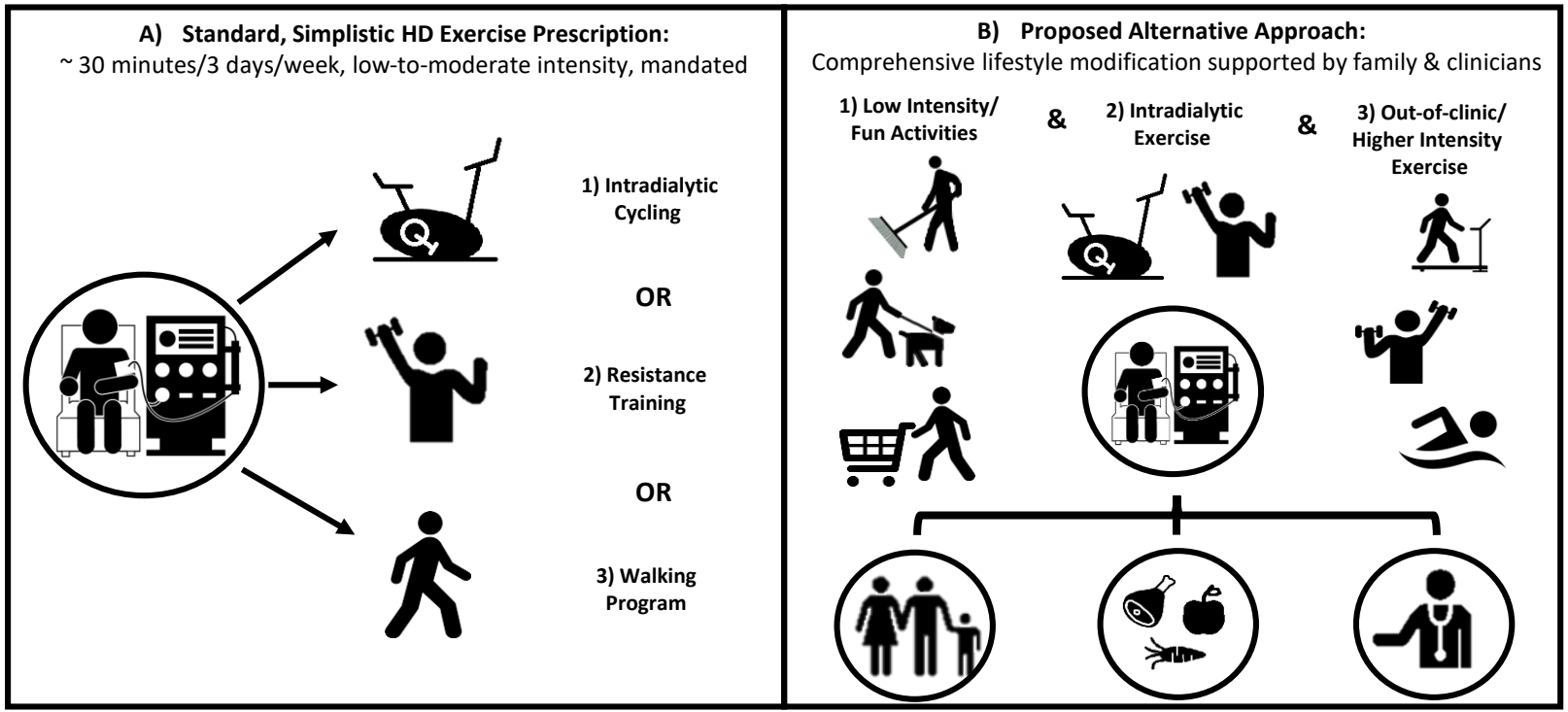
Areas for future research

- The cost effectiveness of employing exercise professionals in dialysis clinics.
- Demonstrate whether exercise programs reduce hard outcomes such as hospitalizations and mortality in dialysis patients.
- The most efficacious approaches for improving patient reported outcomes, such as QOL, restless legs, fatigue, and cramping.

A Critical Review of Exercise Training in Hemodialysis Patients

Personalized Activity Prescriptions are Needed

Figure 1: Standard vs Novel Exercise/Physical Activity Prescription for HD patients



Wilund, Viana & Perez. Exerc Sport Sci Rev, 48: 28-39, 2020