



DIALYSIS OUTCOMES AND
PRACTICE PATTERNS STUDY

**Associations of Self-Reported Physical Activity
Types and Levels with Quality of Life, Depression
Symptoms, and Mortality in Hemodialysis Patients**

Presented on behalf of Arbor Research by
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Physical Activity on prescription

- * **Topic close to my heart**
- **Public health research, Plymouth University**
- **PA, behaviour change & comorbidities**
- **Mental health/ depression**
- **What is known about exercising and dialysis?**
- **Research findings from DOPPS**
- **Summary and Take home message**

E-coacher study findings reported lower depression / anxiety

- A multi-centred randomised controlled trial to investigate the effects of adding web-based coaching (e-coachER) to an exercise referral scheme as a way to increase uptake and sustained health enhancing physical activity for patients with chronic physical and mental health conditions.
- **Results:**
- **The intervention had no significant effect on ERS attendance, EQ-5D-5L or HADS scores, but in complete case repeated measures analyses (including both 4 and 12-months follow up) the intervention participants reported lower depression ($P < .05$) and anxiety ($P = .05$) scores compared with the control group.**



Kidney Disease and Exercise

Exercise can help patients with kidney

[According to the National Kidney Foundation](#)

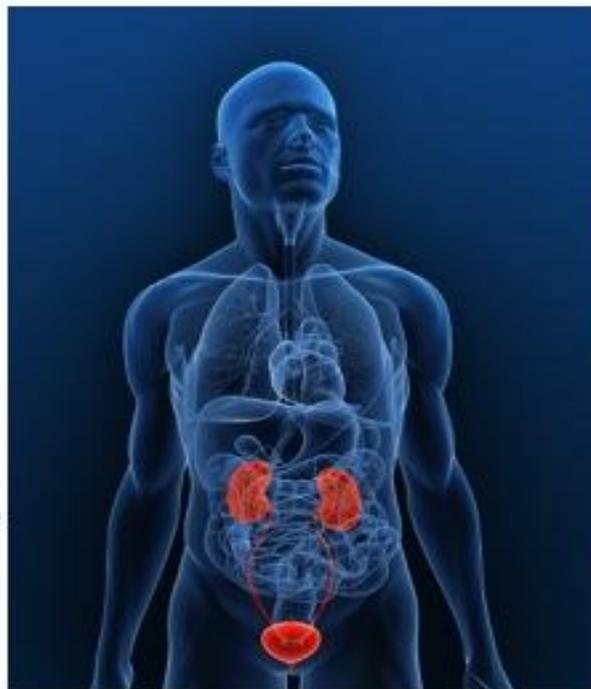
improved muscle physical functioning
better blood pressure control

improved muscle strength

lowered level of blood fats (cholesterol and triglycerides)

better sleep

better control of body weight.



Super Body, Super Brain Kidney



- Individualized for Kidney disease
- Patients/Hemodialysis
- Progressive strength training
- Metabolic workout
- Biomechanics
- Movement complexity
- Balance training
- Coordination
- Circuit training
- Endurance training
- Monitoring/Testing

What is known about Exercising & Dialysis?

Patients with ESRD characterised with low levels of Physical Activity and continuous declining physical function

- **Declining physical health over time**
- **Reduced muscle strength**
- **Increased cardiovascular risk**
- **Fatigue from dialysis**
- **Low mood**
- **Comorbidity & mortality**

Exercise on Dialysis programmes reveal significant improvements

- **Maintenance of overall health**
- **Better blood pressure control**
- **Improved cardiac function**
- **Improved Quality of Life**
- **Better clearance/toxin removal**
- **Improved strength/balance**



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Symptoms, and Mortality in Hemodialysis Patients**

**AA Lopes, B Lantz, H Morgenstern, M Wang, BA Bieber, BW Gillespie, Y Li, P
Painter, SH Jacobson, HC Rayner, DL Mapes, RC Vanholder,
T Hasegawa, BM Robinson, and RL Pisoni**

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Introduction

- Physical activity has been associated with better health status in diverse populations, but it is uncertain whether the benefits of types and levels of physical activity apply for different outcomes, such as health-related quality of life (HRQOL), depression, and survival, in patients on MHD with diverse clinical characteristics.
- To promote physical activity in patients with CKD and patients on dialysis, the Kidney Disease Outcomes Quality Initiative recommends physical activity programs and periodic evaluation of their results. However, the effectiveness of promoting physical activity as part of routine patient management in dialysis units needs to be investigated.

Objectives

1. Describe types and levels of physical activity
2. Describe associations of patient characteristics with different levels and types of physical activity
3. Investigate associations of types of physical activity and levels of aerobic activity with mortality, HRQOL, and depression symptoms
4. Examine whether associations between physical activity and outcomes vary by levels of demographic factors, vintage (length of time on dialysis), and diagnoses of heart failure, ischemic heart disease, and diabetes.

Methods: Study Sample

- The main analysis for physical activity was on the basis of data of **5763** patients from DOPPS phase 4 (2009-2011) who completed all seven questions of the aerobic portion of the physical activity survey and at least one of the strength and flexibility questions.

Methods: Variables of Interest

- **Assessment of Physical Activity**
 - Physical activity levels were measured at baseline using the Rapid Assessment of Physical Activity (RAPA), a self-administered questionnaire composed of nine binary (yes or no) questions with graphic and textual illustrations.
 - Five categories of aerobic activity were defined:
 - (1) never/rarely active (sedentary),
 - (2) infrequently active,
 - (3) sometimes active,
 - (4) often active, and
 - (5) very active.
 - Patients were also classified by their responses to the two binary questions regarding muscle strength and flexibility activities:
 - (1) neither muscle strength nor flexibility,
 - (2) only strength,
 - (3) only flexibility, or
 - (4) both strength and flexibility activities.

Methods: Outcomes

- **HRQOL and Depression Symptoms**

- Patient responses to the 36-item version of the Kidney Disease Quality of Life questionnaire were used to calculate scores of the kidney disease burden (KDB) and two HRQOL summaries (PCS and MCS).
- The 10-item Center for Epidemiologic Studies Depression Scale (CES-D) was used to determine depression symptoms score.

- **All-cause mortality**

Differences in QoL and depression by aerobic physical activity level

Outcome	Extensively Adjusted Mean Difference (95% CI)*					
	Never/Rarely Active	Infrequently Active	Sometimes Active	Often Active	Very Active	
PCS score	Ref=0	1.60 (0.7,2.5)	3.55 (2.6,4.5)	3.82 (3.0,4.7)	6.67(5.8,7.6)	
MCS score	Ref=0	2.15 (1.1,3.2)	3.60 (2.7,4.5)	2.92 (2.1,3.8)	3.70(2.8,4.7)	
KDB score	Ref=0	1.00(-1.4,3.4)	7.05 (5.0,9.1)	5.65 (3.7,7.6)	9.87(7.8,12)	
CES-D score	Ref=0	-0.97(-1.5,-0.4)	-2.24(-2.7,-1.8)	-1.90(-2.3,-1.5)	-2.45(-3.0,-1.9)	
		Extensively Adjusted Odds Ratio (95% CI)*				
CES-D ≥10	Ref=1	0.79(0.64,0.97)	0.52(0.43,0.62)	0.53(0.45,0.62)	0.43(0.35,0.52)	

* Adjusted for geographic region, age, sex, race, smoking, employment status, education, living with family, number of years on dialysis, and assistance with walking, for BMI, 14 summary comorbidities, catheter use, lab values, and SBP; Minimally adjusted estimates were very similar

Mortality and aerobic physical activity

Aerobic Activity Level	N Deaths / N Patients	HR of Mortality (95% CI)	
		Minimally Adjusted ^a	Extensively Adjusted ^b
Never/rarely active	427/1649	1 (Ref)	1 (Ref)
Infrequently active	93/599	0.92 (0.76, 1.13)	0.89 (0.72, 1.10)
Sometimes active	143/969	0.87 (0.70, 1.08)	0.84 (0.67, 1.05)
Often active	191/1373	0.82 (0.69, 0.98)	0.81 (0.68, 0.96)
Very active	119/1173	0.61 (0.48, 0.77)	0.60 (0.47, 0.77)
Total	973/5763		
P for trend		<0.001	<0.001

a. Adjusted for geographic region, age, sex, race, smoking, employment status, education, living with family, number of years on dialysis, and assistance with walking

b. Additional adjustments for BMI, 14 summary comorbidities, catheter use, lab values, and SBP

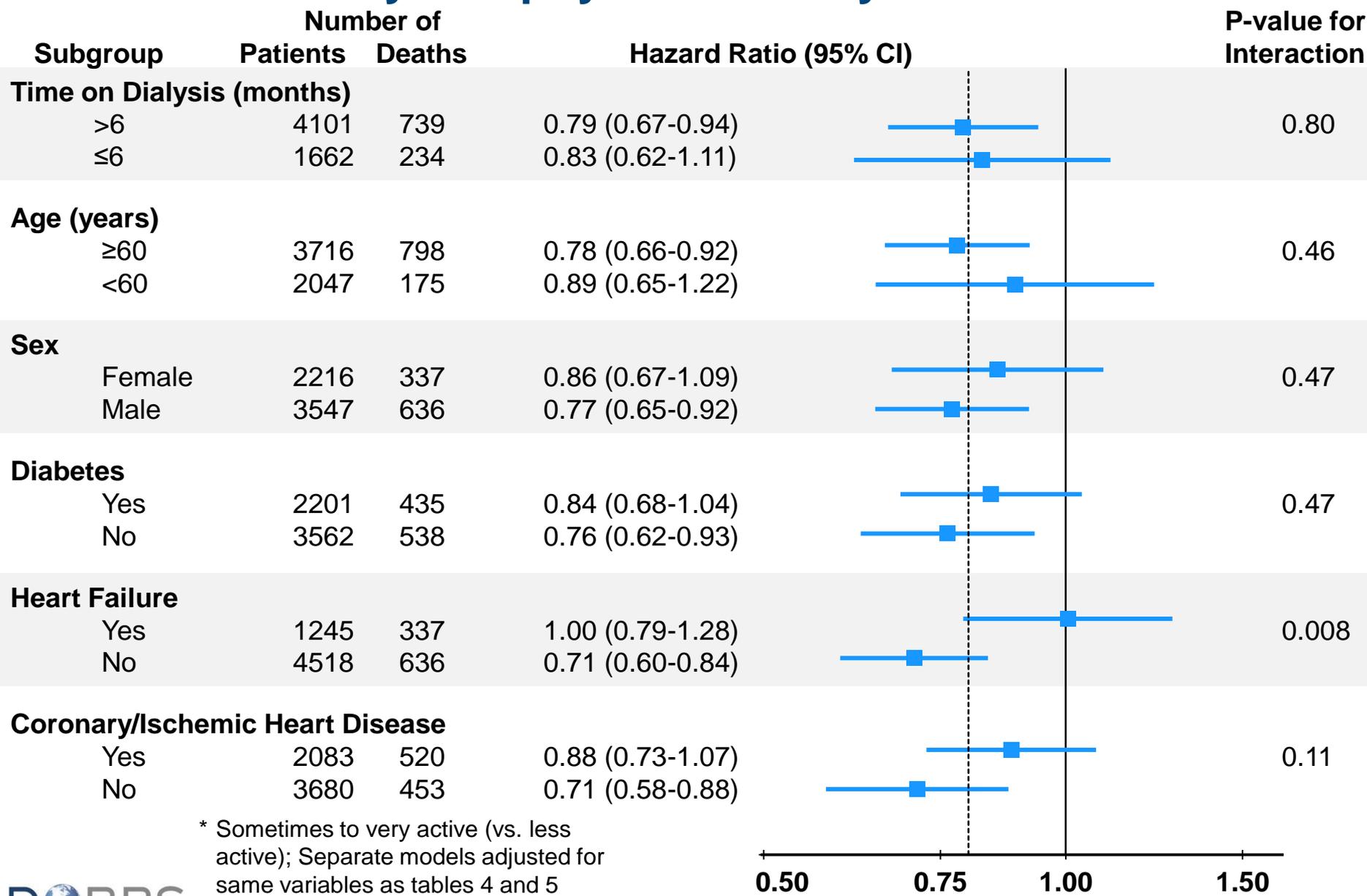
Mortality and muscle strength/flexibility

Muscle Strength or Flexibility	N Deaths / N Patients	HR of Mortality (95% CI)	
		Minimally Adjusted ^a	Extensively Adjusted ^b
None	826/4584	1 (ref)	1 (ref)
Strength	25/250	0.74 (0.48, 1.14)	0.78 (0.50, 1.22)
Flexibility	52/535	0.80 (0.59, 1.07)	0.76 (0.56, 1.03)
Both	70/394	1.27 (0.95, 1.69)	1.25 (0.90, 1.72)
Total	973/5763		
P for trend		0.81	>.99

a. Adjusted for geographic region, age, sex, race, smoking, employment status, education, living with family, number of years on dialysis, and assistance with walking

b. Additional adjustments for BMI, 14 summary comorbidities, catheter use, lab values, and SBP

Adjusted subgroup differences in the association between mortality and physical activity*



Conclusions

- The results indicate better HRQOL, greater survival, and lower depression symptoms in MHD patients engaged in higher levels of aerobic physical activity. The differences in depression symptoms, HRQOL, and mortality increased monotonically across the five categories of aerobic physical activity.
- Our results suggest that the association of higher aerobic physical activity with greater HRQOL, lower depression symptoms, and lower mortality applies for diverse subgroups of MHD patients.

Suggested PA in dialysis unit

- **Cycling machine whilst having dialysis**
- **Resistance bands**
- **Light hand weights**
- **Aerobic exercise for building muscle strength**

- **Just 10 mins a session makes a difference**
- **Of great benefit for weak or frail patients**
- **Sociable and helps pass the time**

Bicep curls with Hand weight



Light aerobic exercise



Cycling on dialysis with arms or legs



Resistance bands for building muscle



D P P S

Art and Craft Activities During Haemodialysis:
an untapped potential to improve patients' experience.

Dr Hugh Rayner, Tony Williams, Karen Bird,
Jim Martin, Sr Helen Bishop, Brian Bieber,
Samuel Johnson Community Hospital,
Lichfield, UK



Conclusion and take home message

- **Nearly every dialysis patient can do some form of activity**
- **Check with the doctor before starting any exercise programme. The doctor can advise on the most suitable type of activity**
- **Start slowly with some gentle stretches – do these before and after activity**
- **Exercise will help build energy and reduce risk of other illnesses**
- **Exercise can help everyone feel, eat, sleep and think better**