

Meddick, Leighan (2016) Exercising during dialysis: a reflection on environmental barriers. The Cumbria Partnership Journal of Research, Practice and Learning, 5 (1). pp. 56-60.

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## REVIEW

# Exercising during dialysis: A reflection on environmental barriers

Leighan Meddick

### Abstract

Research has demonstrated that exercise provides several physical and psychological benefits for hemodialysis patients, which include increasing their quality of life. However, implementing intra-dialytic exercise into the patients' care schemes often proves to be a difficult task for dialysis providers, and they often run into barriers. Some of the environmental barriers that are often experienced are discussed herein, in order to raise awareness and provide recommendations which may result in the process of exercise integration running more effectively.

### Keywords

barriers; hemodialysis; intra-dialytic exercise; kidney disease; physical functioning; quality of life

### Introduction

Patients with end-stage renal disease (ESRD) are placed on dialysis when kidney function is reduced by approximately 85-90% of normal function, and as a result of the disease, their life expectancy is reduced considerably (NHS, 2013). There are estimated to be beyond 60,000 ESRD patients receiving hemodialysis treatment in the UK, with typically 5,000-10,000 new

patients beginning treatment annually (Gilg, Pruthi and Fogarty, 2015).

NHS Kidney Care reported that the cost of incorporating dialysis treatment and kidney transplantation for ESRD costs the NHS in England £1.4 billion per year, more than the combined cost of £1.37 billion that is spent on breast, lung, colon and skin cancer (HMRC, 2011). The ideal situation

for both the NHS and its patients is one in which the patients are eventually able to receive a kidney transplant so they no longer have to dialyse. This would assist in both reducing financial strain and increasing quality of life for the patients.

However, a primary issue with ESRD patients is weight gain. ESRD patients typically dialyse three to four times per week, and spend approximately 4 hours in dialysis each session. Following dialysis sessions, patients report feeling fatigued, with this feeling continuing the following day. As a result, exercise is not usually undertaken (Fiaccadori, Sabatino, Schito, Angella, Malagoli, Tucci, Cupist, Capitanini & Regolisti, 2014). This results in weight gain, which jeopardises chances of receiving a transplant, as a BMI of <35 is needed to be considered for the operation (Johansen, 2005; Howden, Fasett, Isbel & Coombes, 2012).

With research highlighting the beneficial effects of exercise in ESRD patients (Martin and Gaffney, 2003; Goodman and Ballou, 2004; Cheema & Singh, 2005; Ouzouni, Kouidi, Grekas & Deligiannis, 2008; Bennett, Breugelmans, Barnard, Agius, Chan, Fraser, McNeill & Potter, 2010; Howden, et al., 2012; Mohseni, Zeydi, Ilali, Adib-Hajbaghery & Makhloogh, 2013), and revealing that the poor physical functioning experienced by those on dialysis is potentially addressable through exercise, the idea of intra-dialytic exercise has become more popular. However, there are few Renal Units who have adopted exercise as a form of rehabilitation for the patients; something that has yet to be implemented as standard procedure in ESRD patients' care schemes, although exercise has been included as a recommendation in the UK Renal Association clinical practice guidelines (MacGregor and Taal, 2011).

Unfortunately, medical staff on units implementing intra-dialytic exercise typically run into barriers that restrict them (Bennett, et al., 2010), and most units lack staff qualified in exercise prescription. A solution is the attendance of an exercise professional. The attendance of an exercise professional has been found to maximise patient uptake and adherence to exercise routines (Torkington, MacRae and Isles, 2006). However, not all barriers disappear as a result, and the present study describes core barriers that are faced when attempting to implement intra-dialytic exercise.

### **Objectives and Rationale**

The primary objective as an exercise professional is to get ESRD patients as active as possible, as physical inactivity is a strong predictor of mortality in this population (Goodman and Ballou, 2004; Delgado and Johansen, 2012). The benefits of exercise for ESRD patients have been demonstrated in many studies; with regards to increasing physical functioning, improving psychological state, and consequently increasing quality

of life (Martin and Gaffney, 2003; Goodman and Ballou, 2004; Cheema, Singh, Charles, Smith & Singh, 2005; Ouzouni, et al., 2008; Bennett, et al., 2010; Howden, et al., 2012; Mohseni, et al., 2013).

Physical functioning and psychological state can be measured by the Kidney Disease Quality of life (KDQOL-SF™ 1.3) questionnaire (Hays, Kallich, Mapes, Coons, Amin, Carter & Kamberg, 1997). Monitoring these aspects is of importance in order to measure improvements over time (Ouzouni, et al., 2008; Bennett, et al., 2010; Howden, et al., 2012). Alongside this, there is limited research examining the effects of exercise intervention on ESRD patients, especially with regards to resistance training. Within the literature, four out of six studies examining resistance training as an intervention showed improvements in exercise capacity. However, it is currently unclear whether they are substantial enough to be of clinical relevance (Howden, et al., 2012), or indeed transferrable to real life. As a result, there is insufficient research to come to a clear conclusion as to how much resistance training and aerobic training interventions increases physical function and exercise capacity in ESRD patients (e.g. walking capacity, or stair climbing ability) (Orcy, Dias, Seus, Barcellos & Bohlke, 2012). Exploring these methods, and measuring the results, is of importance in order to establish potential benefits.

One of the major aims in a number of patients is reducing BMI so they are eligible for the transplant list. One study has suggested that a higher BMI is associated with improved survival rates in ESRD patients (Kalantar-Zedah, Block, Humphreys & Kopple, 2003). However, this association was formed from reverse epidemiology, which cannot prove cause-and-effect, and reverse causation epidemiology is a known source of bias in epidemiological studies that attempt association without direction of a causal pathway (McLeod and Smith, 2003). The patients themselves know lowering their BMI is necessary to be suitable for transplant; therefore reducing BMI also has a high chance of improving psychological stage, alongside physical functioning in those who are obese.

Finally, restrictions to exercise participation must be examined. Despite proposed guidelines that all dialysis patients should be counselled and regularly encouraged by dialysis staff to increase their level of physical activity (K/DOQI, 2005), the number of ESRD patients who undertake exercise programmes is low, and the compliance rates remain poor (Konstantinidou, Koukouvou, Kouidi, Deligiannia & Tourkantonis, 2002; Cheema, et al., 2005; Ouzouni, et al., 2009; Bohm, Ho and Duhamel, 2010).

### **Barriers to exercise in ESRD**

Many dialysis providers struggle to incorporate exercise into routine treatment for their patients

(Cheema and Singh, 2005; Johansen, 2007; Bennett, et al., 2010; Delgado and Johansen, 2012). The primary environmental barriers, both in the literature and from experience, are listed below.

### **Medical Staff commitment**

The two most important requirements to ensure exercise programmes remain sustained for dialysis patients are 1) Exercise professionals must be present, 2) Both dialysis and medical staff on the ward must be committed to exercise promotion (Bennett, et al, 2010).

Often, there can be disconnect between the nursing staff and the implementation of exercise, and it restricts the implementation of exercise onto the ward, even with an exercise specialist present. With few nurses on the ward committed to the project, if an external exercise facilitator is not present to bring patients the equipment, the majority are unable to exercise. One could argue the nurses may not have the skill-set to set up the bikes. This was found to be a problem in previous research (Painter, Carlson, Carey, Myll & Paul, 2004), but from experience, knowledge of how to set up the equipment does not necessarily lead to it being used.

The issue of staff commitment appears multifactorial. Patients often mentioned 'feeling like a burden' and would avoid asking the nurses for bikes when they appeared busy. Without the patients reminding them, they likely focus on their other workloads. Another issue is related to a lack of education for the nursing staff with regards to the benefits of exercise in ESRD patients. Unfortunately, even when presented with numerous reasons why exercise should be promoted, nurses still often lack the motivation to support exercise projects (Bennett, et al., 2010). As nurses are not qualified in exercise prescription, some were cautious of promoting exercise because they were unsure of its safety, especially in elderly patients. However, a doctor is required to sign an exercise consent form for each patient, so this is no longer an issue. Alongside this, age is no barrier to exercise on hemodialysis (Bennett, et al., 2010), and one of the most successful exercisers on the ward attended by the author is aged >80. Reported in the literature, the older the patient, the higher the compliance rate (Bennett, et al., 2010).

Knowledge of the theory does not always encourage practice when it comes to the nursing staff. Those that assist do not necessarily know why exercise is being introduced; they assist simply because the patient may ask and because they know it is a project on the ward. In some cases it may be necessary for individuals to know the theory in order to make them feel it is worthwhile. An unfortunate reality is that dialysis nurses still view exercise to be

a low priority in their workload (Cheema and Singh, 2005). Due to a lack of policy regarding exercise on dialysis, nurses may feel that it is indeed below other jobs in terms of priority.

With maximised uptake and adherence to exercise as a result of the attendance of an exercise specialist to dialysis units, there are potential benefits for both the patients and the NHS. Alongside the increased benefits to be had by the patients, which include the ability to receive a transplant and therefore increase quality of life, the cost to the NHS regarding dialysis will also be lowered. It could be argued that the salary of a full-time exercise specialist would 'pay for itself' with the potential savings to be had by their attendance. Incorporating dialysis treatment and kidney transplantation for ESRD patients costs the NHS in England more than £1.4 billion per year, more than the combined cost of £1.37 billion that is spent on breast, lung, colon and skin cancer (HMRC, 2011). With more patients receiving transplants, the cost to the NHS for long-term dialysis would be lowered.

### **Unit Guidelines and Policies**

Exercise intervention in Renal Units remains a developing area, with few hospitals having guidelines or policies in place regarding exercise. This means nursing staff are unaware of what exercise protocol to follow if a patient wants to exercise when no specialist is present. If these guidelines were to be implemented, it would allow nurses to feel confident guiding the patients without the presence of an exercise specialist.

### **Exercise Promotion**

Promoting exercise on dialysis wards is often a difficult endeavour (Heiwe and Tollin, 2012; Fiaccadori, et al., 2014), but what has been learnt from experience is that it should not be assumed the language on any promotional documents is simple enough for each patient to understand. This may not be the case, and a better idea would be for the exercise specialist to talk through the documentation with each patient individually. Addressing each patient individually is more likely to result in the patient taking notice of the information that is provided to them.

### **Exercise Protocol**

Forgeron and Valeriote (2001) found that an important requirement for sustainable intra-dialytic exercise programmes is that they need to be interesting and stimulating. However, while the patients had a television to watch while cycling, the cycling itself was a basic routine. Had it been developed so it was more stimulating, perhaps the compliance rates would have increased. Unfortunately, however, there is little variation to be



had with bikes, so perhaps other methods of exercise need to be considered. In the future, more emphasis needs to be placed on developing suitable resistance training programmes.

### **Patient Motivation**

Unfortunately, the biggest barrier of all is that the majority of patients are either uninterested in taking part in exercise routines, or will only do so when the exercise specialist is there. Patients often express the need to have someone to talk to while cycling, and having this request granted often increases patients' acceptance of the exercise routines (Heiwe and Tollin, 2012). This is something the nurses cannot provide as well as a dedicated exercise specialist because they will often have many other jobs to complete. However, the patients, in most cases, will still only begin and comply with exercise routines when the doctor prescribes it. They then start to feel that it is compulsory, and without doctor recommendation, exercise compliance is low. Ideally, if the doctor is responsible for introducing ESRD patients to the concept of exercise, then the NHS is in the position of being responsible for informing the doctors nationwide of the importance of exercise in ESRD patients, and raising the awareness.

Until support comes from those who are in the best position for encouraging sustained activity for the patients, exercise will struggle to be implemented. Doctor recommendations could perhaps turn out to be one of the most effective exercise promotion methods.

### **Exercise Specialist Attendance**

Related to the exercise specialist role itself, Ridley, Hoey & Ballagh-Howes, (1999) recommend that, in order to promote a positive impression on the wards, exercise specialists should be present at least two times per week per patient group. This was not the case in our scenario, with each patient group only being visited once per week. A solution to this would be either a full-time role, or recruiting two students at a time, with both visiting twice a week or more. Based on previous findings, it could provide better results regarding patient adherence than once per week visits (Bennett, et al., 2010), and increased contact time would likely result in increased exercise acceptance because the patients have longer contact time with the students (Heiwe and Tollin, 2012).

### **Conclusions and Recommendations**

The most important requirements to ensure exercise programmes remain sustained for dialysis patients are that exercise professionals must be present, and medical staff on the ward must be committed to exercise promotion (Bennett, et al, 2010). Unfortunately, getting full support from the medical

staff can prove challenging as dialysis nurses still view exercise to be a low priority in their workload (Cheema and Singh, 2005). In addition, the patients, in most cases, will only adhere to exercise routines when the doctor prescribes it to them, and when they have someone to talk to while cycling (Heiwe and Tollin, 2012).

If doctors begin to promote exercise to patients, interest in exercise will likely increase. In addition, if nurses understand that patients often shy away from asking them because they do not want to bother them, it may encourage them to approach the patients. If the nurses have any doubts about equipment, they should interact with the exercise specialist in order to become competent.

Instead of handing out promotion articles, the exercise specialist should sit down and talk the patients through them. All of the nursing staff should be provided with the same information in order to increase their theoretical knowledge; hopefully leading on to them understanding why supporting exercise adherence is so crucial. Providing the nurses with the exercise guidelines which were completed during the placement would provide them with the information they need to oversee sessions themselves.

Finally, exercise specialists should be present at least twice a week per patient group in order to promote increased contact time and have a bigger impression upon staff. This is likely to result in increased exercise acceptance and compliance rates among the patients and staff (Heiwe and Tollin, 2012; Bennett, et al., 2010).

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### **Acknowledgements**

The author would like to thank Heather Hill, Specialist Renal Dietician and Dr Aimun Ahmed, Consultant Physician and Nephrologist, for their support and guidance throughout, in addition to all of the staff at the Westmorland General Hospital Renal Unit. A thank you also goes out to Theodoros Bampouras of the University of Cumbria, for facilitating the link between the University and renal unit.

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