Strategies for Improving the Effectiveness of Exercise in Dialysis Patients

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Thanks to our speaker!

- **Dr. Ken Wilund**
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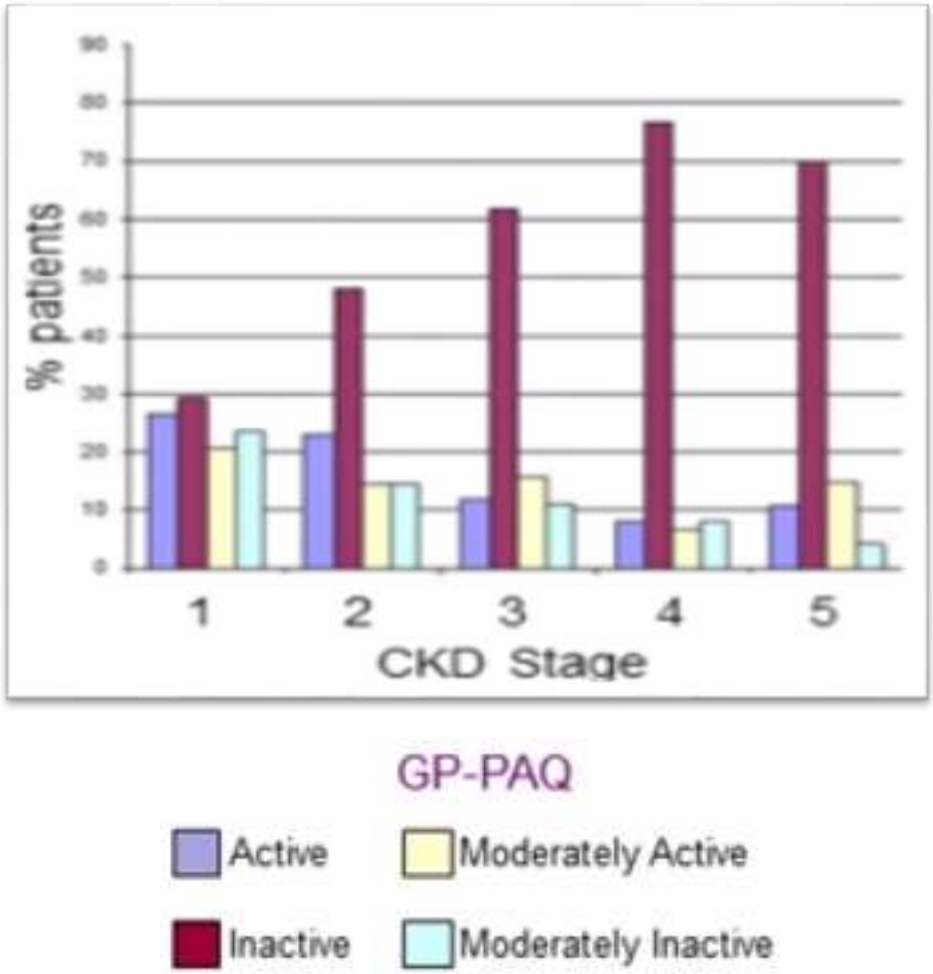
- Dr. Wilund has more than 70 peer-reviewed journal articles
- The primary focus of the research in his lab is the individual and combined effects exercise training and nutritional factors on the health and quality of life of patients on dialysis

Objectives

- Discuss what we currently know about the benefits of exercise in hemodialysis patients, including what has and has NOT worked.
- Discuss reasons for the poor adoption of exercise by dialysis patients, and dialysis clinics, as well as strategies for overcoming them.
- Outline strategies for incorporating more exercise into your life, what type of exercise, and how to make that exercise MORE EFFECTIVE.
- *“Provide a lot of optimism with a heavy dose of reality”*

CKD Patients are EXTREMELY Inactive



Dialysis Patients are 60% less active than age-matched healthy individuals

Primary reasons for inactivity - In general… as well as dialysis…

- Injury/Disease
- Convenience/modernization (e.g., cars, elevators, TV/online shopping…
- Sedentary recreation (e.g., watching TV/movies, or surfing the net)
- Boredom? Lack of competition??

Restated:

1) We have engineered activity out of our life

2) *We worry too much about getting hurt/causing harm*

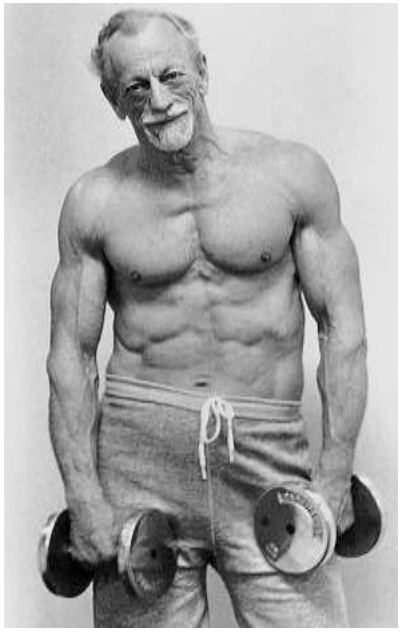
3) *As we get older, we forget how to have fun*

***NOW ADD IN RIGORS OF DIALYSIS**:*

1) Lack of Time due to dialysis sessions

2) Post-dialysis nausea and fatigue

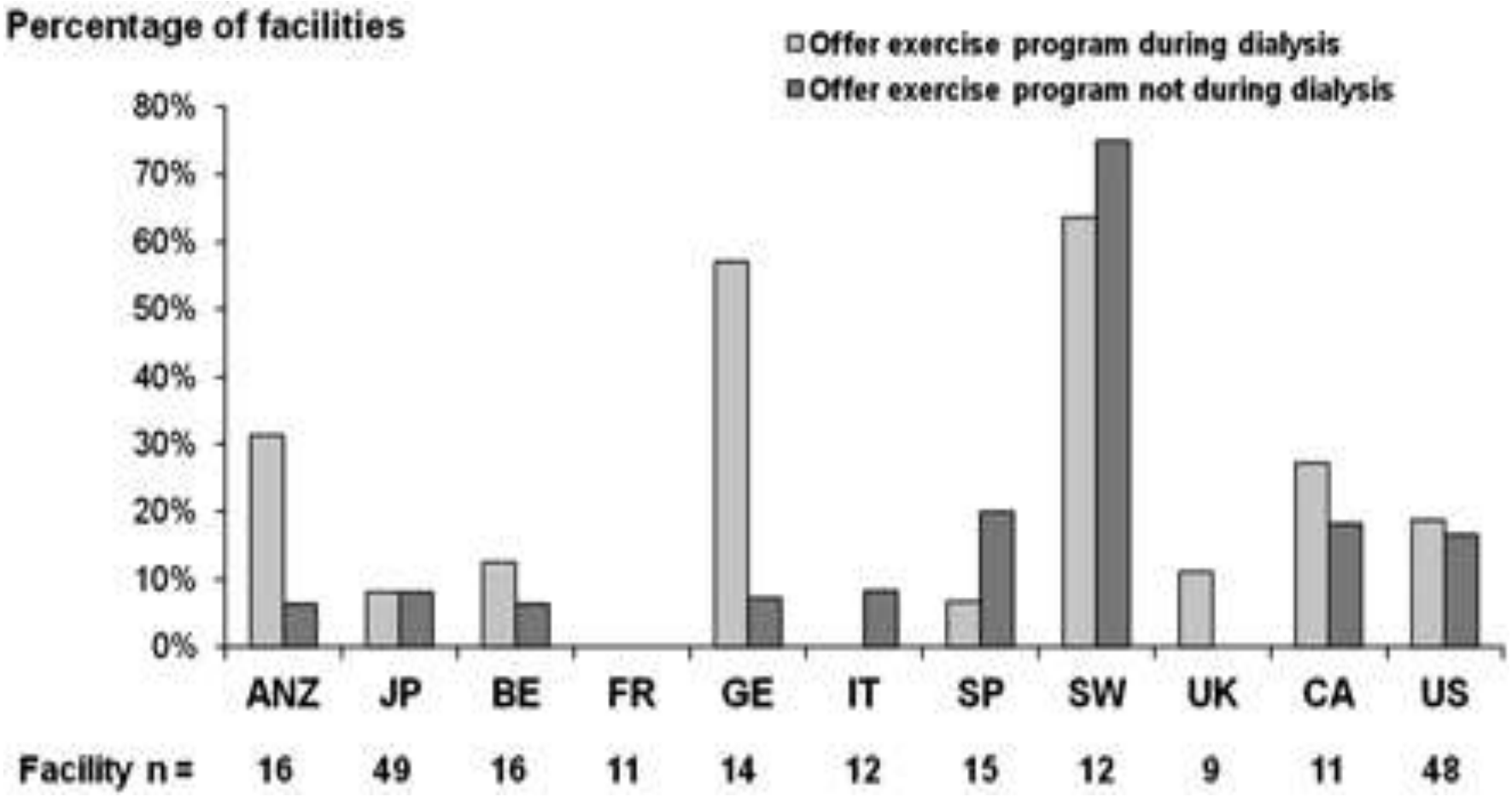
3) Significant co-morbid disease….



Categories of Exercise for Dialysis Patients

- **<u>"INTRA-dialytic" exercise</u>**
  - *Benefits*: Captive audience
  - *Concerns*: Limited mobility
    - Cycling is most feasible
      - ***<u>and most of what we know about</u>***
    - *Strength training (during dialysis) is difficult*
- **<u>NOT during dialysis</u>**
  - *Benefits*: in theory, unlimited options
  - *Concerns*: Compliance
    - Access, motivation, supervision

How common are Intradialytic exercise programs?



Commonly Cited Barriers to INTRADIALYTIC Exercise

1) Patient-related
   - Poor health/fatigue
   - Time, knowledge, confidence
   - Access to equipment/facilities

2) Clinic Staff-related
   - Staff burden, expertise
   - Nephrologist support

3) Financial barriers
   - Who will pay for it?
   - When research grants end…programs often end

The Barrier Nobody Wants to Talk About:

- ***MANY Nephrologists are "skeptical" about the benefits of exercise in dialysis patients***

- Nephrologists, nurses, techs… often voice concerns about:
  - Effectiveness
  - Cost
  - Safety
  - Staff burden…

Why all the doubt about exercise? Don't we have tons of evidence it works?

Demonstrated benefits - IMPROVED:

- 1) Muscle mass, strength, and physical function
- 2) Health and function of heart and arteries
- 3) Dialysis "Efficiency" – i.e., how well toxins are removed
- 4) Quality of Life

PROBLEMS:

- 1) studies are small… *magnitude of benefits are small*… and NOT *overly convincing* to Nephrologists, Nurses…
- 2) Programs are difficult to implement (lack of resources/time)

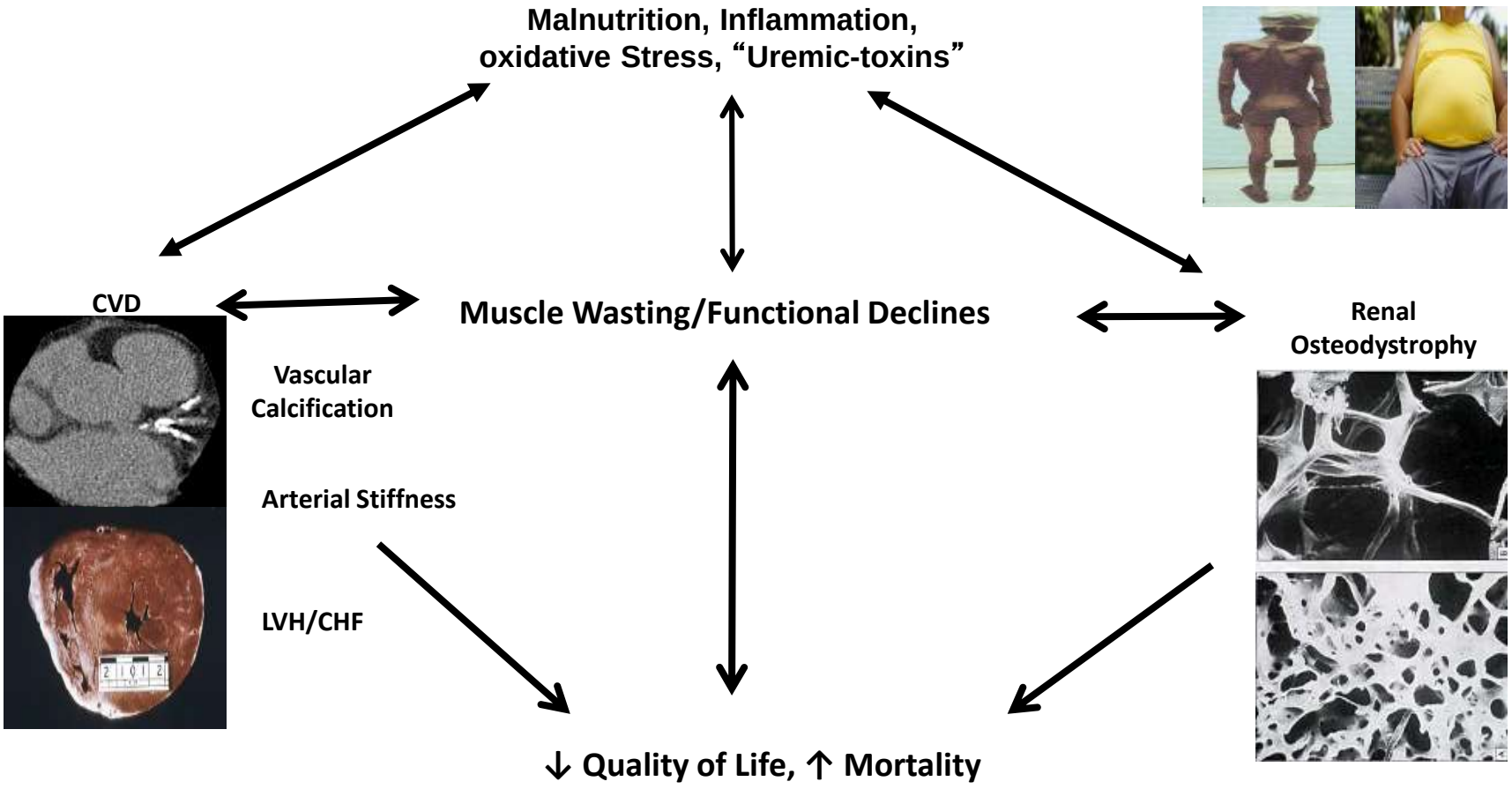
CONSEQUENCE: promoting exercise is NOT a major priority for clinic staff!

What are reasons for some of the the "uninspiring" data?

- **In many studies, the exercise volume and intensity been very low**:
  - Low intensity cycling for ~ 1 hour per week (its just not that much)
  - ~ 35- 70 kcal expended per session in several studies

- **Are the patients too sick**?
  - Are arteries too damaged/calcified?
  - Are muscles to damaged/weak to adapt?

Think about what we are asking exercise to do! (a lot):



********IT IS HARD TO STOP THIS BY RIDING A STATIONARY BIKE 1 HOUR/WEEK!***

Despite uninspiring data from some studies… we still know exercise CAN work… and REALLY WELL:

- See story of Shad Ireland (*www.ironshad.com):*
  - Age 11 – kidney failure, starts dialysis
  - Age 20 - 2 failed transplants, weighed 85 pounds, is captivated watching triathlon
  - Age 31 - completed 1st Ironman Triathlon
- *Take home message:* this stuff works… but we must do more

Successful Anecdotes from my lab

- Patient #1: 35 year old A.A. male, Sedentary, obese, high blood pressure, diabetes, weight gain between treatments averaged ~ 5Kg

- Was in one of our exercise studies for one year (cycling during treatment for 45 min/day). But had HORRIBLE exercise compliance

- One Friday treatment, began cramping…. Was provided saline…. Got VERY thirsty. Over the weekend DRANK 10L OF SODA. Weight gai

- Finished study… Saw zero benefits…

- We took away bike… After 2 weeks, he asked for it back, started cycling 1-2 hours/session, convinced him to change his diet….

- He lost 40 pounds and got a transplant. *But MY study showed he did NOT benefit*

Anecdote #2

- 60 year old Caucasian male, severe depression
- Assigned to intradialytic cycling, 45 minutes, 3 days/week
- Completed most exercise sessions, but intensity was extremely low
- Small improvements in physical function at 1 year, but measures of heart and artery health did not change
- However…Depression and QOL indices significantly improved:
  - "I wanted to commit suicide…. This bike saved my life."
- *My study showed no benefit*
- Take home message: Much evidence indicates exercise benefits mental health and well-being! Its one of the great reasons to exercise, *ESPECIALLY for dialysis patients.*

Anecdote #3

- **"T.C." ~ 60 year old Hispanic male**
- **Sedentary, obese, diabetic…**
- **Put in a "Control" group in my study (no exercise), and not happy about it…**
- **After 1 year in "control" period, he asked to "try" the bike.**
- **Started cycling for one hour at clinic, bought bike for home to ride with wife…**
- **Exercise motivated him to change diet, lost weight, got transplant.**
  - **Another example of a bike saving a life**
- ***My STUDY showed no benefit***

Other anecdotal observations

- Our failures have been much more frequent than our anecdotal successes.
- A.A. women have been especially difficult
- It takes many patients a year or more to change their behavior

How can we be more successful… more often?

***Comprehensive behavior change is needed*:**

1) Exercise prescription should be more than a bike in front of a chair
   - Standard Physical Activity Rec's include:
     - "Aerobic" exercise (walking, swimming…): 30-60 minutes/day
     - "Strength training" - several days/week
     - "Balance training" – several days/week
     - "Flexibility training" – several days/week

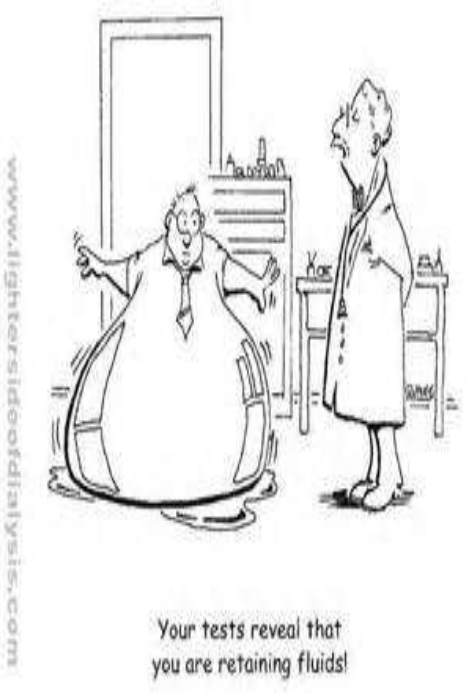
The amount/type of exercise we often prescribe does NOT match what we know works the best!

2) Nutritional Concerns MUST be addressed for the exercise to be effective:
   - ***Chronic volume overload***

Chronic Volume Overload

- **Why a problem?**
  - Increases Blood pressure, cramping…
  - ***MY concern: it may PREVENT benefits of exercise***

- **How common is it?**
  - Prevalence in U.S. may be > 80%!
  - *(anyone on blood pressure med, or hypertensive)*



- **What to do about it?**
  - Can *be nearly eliminated* using intensive management of dry weight AND dietary salt restriction

  - Izmir, Turkey: 95% of patients have NORMAL blood pressure WITH NO MEDS!!

The KEY to preventing volume overload:

Dietary Sodium restriction (to reduce thirst) !

3 Main Rules for Reducing sodium intake:

1. **Shop for "whole foods"**
   - **liberalize dietary restrictions on phosphorus and potassium (fruits/vegies/grains/nuts/dairy… within reason are NORMALLY o.k.!)**

1. **If its in a package… read the label (processed food)**
   - **The "1mg Sodium/Calorie rule**

2. **<u>Limit</u> eating out**

"The 1mg sodium/calorie rule"

> 1 mg/kcal

Nutrition Facts

Serving Size 1 Bag (1g)
Servings Per Container 1

Amount Per Serving	
Calories 250	Calories from Fat 90
	% Daily Values*
Total Fat 10g	**15%**
Saturated Fat 4g	**20%**
Trans Fat 0g	
Cholesterol 100mg	**33%**
Sodium 440mg	**18%**
Total Carbohydrate 38g	**13%**
Dietary Fiber 2g	**8%**
Sugars 0g	
Protein 2g	**4%**

*Percent Daily Values are based on a 2,000 calorie diet.

Sodium/calorie = 440/250 > 1 (BAD)

< 1 mg/kcal

Nutrition Facts

Serving Size 1 Cup (1g)
Servings Per Container 1

Amount Per Serving	
Calories 300	Calories from Fat 108
	% Daily Values*
Total Fat 12g	**18%**
Saturated Fat 3g	**15%**
Trans Fat 0g	
Cholesterol 120mg	**40%**
Sodium 130mg	**5%**
Total Carbohydrate 45g	**15%**
Dietary Fiber 5g	**20%**
Sugars 0g	
Protein 4g	**8%**

*Percent Daily Values are based on a 2,000 calorie diet.

Sodium/calorie = 130/300 < 1 (GOOD)

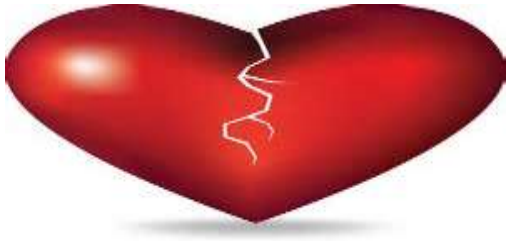
"Is the sodium # bigger than the calorie #?"

I taught 75% of these people how to shop using the 1mg sodium/calorie rule

For BEST RESULTS: Nutrition + Exercise!

1) Volume control:
a) Aggressive dry weight management

b) Sodium Restriction



2) Comprehensive Physical Activity Program:

Goal: OPTIMIZE Heart Health and Physical Function:

- strength
- balance
- cardiovascular training

Components of an "Ideal" exercise program for dialysis patients (what WE are starting to do)

1) **DURING DIALYSIS:**
   - **A. CYCLING**
   - **B. STRENGTH TRAINING…with balls/bands/dumbbells**

2) Promoting Exercise in waiting room?

Any free moment is a chance to move more! (chair squats, pacing…)

3) Education/wellness program for the patient's family

Vital component, normally overlooked

4) Wellness program for the staff

A healthy staff can MODEL healthy behaviors for patients!

5) Promote "simple" nutritional advice

With better nutrition… exercise stands a better chance!!

OUR out of clinic exercise program

- Our physiotherapists use the dialysis period to counsel patients how to incorporate more physical activity/exercise outside of the clinic

- Walking program
  - http://www.acsm.org/docs/brochures/starting-a-walking-program.pdf

- At home strength and balance (focus on falls!)
  - http://www.cdc.gov/homeandrecreationalsafety/Falls/compendium.html

- Identify exercise/PA opportunities in the community
  - Mall walkers, free community fitness centers…

- Get family involved!

- Be creative/give them choices!
  - How do YOU exercise?

Unfortunately, most clinics don't have in center physiotherapists

- No money for it….
- Can the clinic staff help?
- Unfortunately, don't get you hopes up…

How can the dialysis staff support the patients?

- They need training also….
- WE are providing Training/In-services
- Developing a Staff Wellness Program
  - "WOW Fresenius"
- Incentive programs
  - "Fitbit" challenge

- In the absence of a VERY dedicated Nephrologist, the staff is UNLIKELY to be a great resource for you
- Long term…we HAVE to convince clinics to hire exercise specialists….
- ***Until then, its up to YOU to get educated… (the good news: its NOT that hard!)***

What do dialysis patients need to know prior to starting an exercise program?

- ***General exercise guidelines for ALL individuals (not specific to dialysis)***
- **Do not start exercising, or discontinue exercise if already in progress, if you experience any of the following:**
  - Chest pain
  - Arm pain, particularly radiating pain
  - Resting Blood pressure > 200/110
  - Resting heart rate > 120 bpm
  - Blood pressure > 220/105 during exercise

Are there specific exercise-related considerations for dialysis patients?

- NOT REALLY… *But there are some bad MYTHS to be aware of!*

- 1) Don't lift more than 5-10 pound weights with your access arm? **WRONG**
  - **Only applies for a short time after your surgery**

- 2) All patients need an "exercise stress test" prior to starting an exercise program? **WRONG**
  - Its never a bad idea to talk to your physician if have heart issues… but this is WAY too conservative of a recommendation.
  - *The risk of NOT exercising is almost always > than the risk of being sedentary!*

- 3) Patients should sleep during dialysis… because dialysis is a big enough stress on your body already? **WRONG.** *Dialysis represents a CRITICAL time to exercise.*

- 4) Exercise during the 3rd hour of dialysis is not safe? **WRONG**
  - MAYBE true if history of low blood pressure during treatment,
  - or if having LARGE amount of fluid removed (> 1.30 L/hour) on a particular day

What are simple steps dialysis patients can take to incorporate exercise into their lives?

- **See my blog… But in brief:**

- ***1)*** **We have engineered activity out of our life…. Engineer it back in!**
  - Taking stairs, parking a few blocks from work or the clinic, get off on the WRONG bus stop….
  - Don't buy power saving devices (I have a push mower…)

- **2) Don't get pinned to a chair/couch…**
  - At work, make a standing/walking workstation
  - At home… use commercial breaks to move
  - Become a pacer (on the phone, brushing teeth, watching kids sports….)

- **3) MAKE IT FUN… and/or competitive!**
  - sign up for a race
  - Find friends to walk or workout with

Conclusions/Summary

- Dialysis patients are as sedentary as any clinical population
- Most exercise programs involve intradialytic cycling. This is a good start, but much more is needed…
  - Physical activity inside and outside of the clinic needs to be a priority!
  - Nutritional concerns must also be addressed!
- Unfortunately, in the absence of: 1) a REALLY dedicated Nephrologist; or 2) an in-center physiotherapist, clinic staff is unlikely to promote exercise
- The good news: exercise is NOT that hard! And there are very good and easy resources to help you get moving! (next slide)
- *It is safe* for almost ALL patients to engage in more exercise,
- *And it should be fun!*
- Remember the anecdotes – they are real, and they are spectacular!

Simple Take Home message:

- What is the most important TYPE of exercise?
  - Whatever kind YOU LIKE!
  - Just move more!

Resources

- Life Options:
  - Program founded in 1993 to help people live long and live well with kidney disease.
  - National panel of researchers, clinicians, and ESRD Network directors.
  - Materials at http://lifeoptions.org/
    - *Exercise: A Guide for People on Dialysis*
    - *Exercise for the Dialysis Patient: A Guide for the Nephrologist*
    - *Evaluation: Unit Self-Assessment Manual for Renal Rehabilitation*
    - *Building Quality of Life: A Practical Guide to Renal Rehabilitation*
    - *Exercise for the Dialysis Patient: A Prescribing Guide*
- Resource packs to facilitate exercise on dialysis. From Kidney Health Australia.
  - Detailed instructions on how to conduct intradialytic cycling and resistance training:
  - http://kidney.org.au/
  - http://www.ncbi.nlm.nih.gov/pubmed/26863718
- ACSM guide on how to start a walking program:
  - http://www.acsm.org/docs/brochures/starting-a-walking-program.pdf
- Falls prevention programs: CDC compendium on falls prevention:
  - http://www.cdc.gov/homeandrecreationalsafety/Falls/compendium.html

QUESTIONS?

Renal and Cardiovascular Disease

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