Lessons learnt from the ExDose Trial: *a trial of telehealth delivered exercise program aimed at increasing cardiorespiratory fitness for people after stroke.*

Margaret Galloway (PhD) University of Newcastle, School of Health Sciences margaret.galloway@newcastle.edu.au

27th March 2020

**Overview:** We recently completed a study aimed increasing cardiorespiratory fitness for people after stroke. 21 stroke survivors in 4 groups completed 8 weeks of CFR training, 3 days/week at moderate to vigorous intensity for 10-25 min/session. All sessions were delivered via *telehealth*. The main finding was that it was feasible for community-dwelling stroke survivors to participate (see link to our published paper below).

Below are some helpful tips and lessons we learnt from delivering this intervention.

**Pre-exercise Screening**

All participants were screened by their GP prior to commencing the program. Screening was based on ACSM guidelines (contra-indicators for exercise)

|  |
| --- |
| Tips:* use the ESSA screening form to determine if this is needed for your patients, or follow your service’s established exercise screening process <https://www.essa.org.au/Public/ABOUT_ESSA/Adult_Pre-Screening_Tool.aspx> or go to the ACSM website (see <https://journals.lww.com/acsm-msse/Fulltext/1998/06000/AHA_ACSM_Joint_Position_Statement__Recommendations.34.aspx>)
* Add some stroke-specific screening items for telehealth e.g. falls history, communication, level of disability, aids used, living arrangements/support, mobility etc
 |

**Home visit prior to commencing** **and initial session**

Useful for: face to face meeting, tech set up, home exercise space safety review, discussion with family/responsible adult re emergency procedures, and to for initial assessments

|  |
| --- |
| Tips: * A home visit may not be needed if the patient has adequate internet/computer skills and/or has someone at home to help and supervise.
* Use the initial telehealth session to familiarise and assess only
* Ensure emergency plan is discussed.
* Address and phone number where person is exercising needs to be confirmed EACH session and on hand in case of emergency (people can log in from anywhere)
* Check wellness at the beginning of each session (illness, injury, soreness)
 |

**Safety assessment**

|  |
| --- |
| **Tips** * Can be done over telehealth.
* Ask patient or carer to rotate device so you see the entire exercise space (Note that depth perception is affected with a 2D view of their space)
* Ask them to estimate or step out the distance between the computer and the back of the room.
* Make note of any rugs, coffee tables etc and remove any obstacles.
* Review each session
 |

**Exercise Dose and Session details: (FITT components)**

Our participants exercised 3d/week, at mod-vigorous intensity for between 10 and 25 min/session.

|  |
| --- |
| Tips:“Start with what you do already, and adapt it to telehealth as you need”Frequency 2-3 times per week is idealIntensity Prescribe light-moderate intensity if pre-ex testing not available 40-70% HRmax\* or  8-13 on a 20- point Borg scale or 1-4 on 0-10 scaleDuration 20 min plus warm up and cool down Break down into 5 min hits of alternating intensity Switch between upper and lower body exercises to prevent fatigue Aim for 2 to 5 different exercises per session, minimal rest between exercisesProgression 5 mins of 1:1 (15s hard:15s easier), gradually progressing to longer work intervals and shorter rest intervals as patients adapt (e.g 60s:15s)*\*Max HR is usually estimated by 220-Age, however in the elderly a better equation to use is* *HR max = 206.9- 67% x Age. E.g. if Age = 65, predicted HR max = 163. Note: predictions not valid if on β-blockers*  |

**Equipment**

|  |
| --- |
| Technical* Phones (use phone while logging on the first time with the patient)
* Laptops work best as screen angle can be adjusted easily.
* Internet speed- NBN is best. Broadband- generally not recommended. Video quality will vary (do a test connection before committing to telehealth)
* Platform: choose one you are familiar with. Test with many volunteers (tech and non-tech savvy) before commencing
* Have telephone numbers available for you to call client, and for them to call you
* Provide written instruction on how to connect
* Have pre-prepared videos and share-screen with exercises

**Exercise*** Sturdy high backed chair (use for balance, and for sit to stands)
* Small weights (e.g. tins of food, pasta)
* Aerobic Step (consider providing if required)
* Exercise bike, theraband, pedals etc
* Heart rate monitor or pulse oximeter
* Participant manual (including descriptions of exercises included in their exercise program)
 |

**Exercise selection from the ExDose program**

|  |  |  |  |
| --- | --- | --- | --- |
| Exercise Type | Equipment*(exercise adaptations)* | Higher intensity exercises*(pace)* | Lower intensity exercises*(pace)* |
|  |  | **Easier** | **Harder** |  |
| Whole Body |  |  |  |
| Marching on the spot | Nil | Marching*(moderate)* | Marching -Knees up-Using Arms*(faster)* | MarchingWalking*(slower)* |
| Aerobic moves | Nil*(vary according to ability)* | Heel touchesSide-stepping*(moderate)* | 4-squareSide step with clapUsing arms*(fast)* | Heel touchesSide steps*(slower)* |
| Lower Body |  |  |  |
| Stepping | Aerobic step*(height variable)* | Step upsUp and over *(steady)* | Step ups *(fast)*Raised step height | Marching*(moderate)* |
| Sit to Stand | Stable chair *(with or without arm rests; with or without hands on thighs)* | Higher chair with arm restLower chair with arm restHigher chair no arm rest. *(moderate)* | Lower chair no arm rest*(moderate)*Lower chair no arm rest.*(fast)* | MarchingWalking*(slower)* |
| Squats | Nil | ¼ squats (wall) ¼ Squats¼ Squats (moving)*(moderate)* | ½ Squats½ squats (wall)½ Squats (moving)*(moderate)* | MarchingWalking*(slower)* |
| Stairs | Stairs*(using handrail)* | 2-3 stairs up and down*(slow)* | 3-5 stairs up and down(*slow)* | MarchingWalking*(slower)* |
| Wall push ups | Wall*(One or two arms placed on wall)* | Push ups (½ arm length from wall)*(moderate)* | Push ups (arm’s length from wall)*(moderate)* | MarchingWalking*(moderate)* |
| Upper Body |  |  |  |  |
| Dumbbell arm exercises | Light dumbbells or small weights (e.g. tins of food)*(increasing weights as required; single or both arms according to ability*) | Shoulder press *(alternate arms)*Lateral raises Upright row *(moderate)* | Push pressShoulder press/lateral extension*(both arms)*Cleans *(from knees, ½ squat)**(moderate)* | Biceps curlsMarching with biceps curls*(slower)* |

**Generic ExDose program for 20 min sessions, 8- week program**

|  |  |  |
| --- | --- | --- |
| Week | Intervals or Reps | Exercise  |
|  | High:Low intensity (s) | Reps (n) | 1 | 2 | 3 | 4 | 5 |
|  (20 min sessions) |  |  |  |  |  |
| 1 | 15: 15 | 3-5 | Whole  | Upper  | Lower  | Whole  |  |
| 2 | 30: 30 | 3-5 | Whole  | Upper  | Lower  | Whole  |  |
| 3 | 30: 30 | 3-5 | Whole  | Upper  | Lower  | Whole  |  |
| 4 | 30: 30 | 5-7 | Whole  | Upper  | Lower  | Whole  |  |
| 5 | 45: 15 | 7-10 | Whole  | Upper  | Lower  | Whole  |  |
| 6 | 45: 15 | 7-10 | Whole  | Upper  | Lower  | Whole  |  |
| 7 | 60: 15 | 7-10 | Whole  | Upper  | Lower  | Whole  |  |
| 8 | 60: 15 | 10-12 | Whole  | Upper  | Lower  | Whole  |  |

**Some useful references**

Galloway et al (2019). The feasibility of a telehealth exercise program aimed at increasing cardiorespiratory fitness for people after stroke. <https://telerehab.pitt.edu/ojs/index.php/Telerehab/article/view/6290/6855>

Crotty, M., Killington, M., van den Berg, M., Morris, C., Taylor, A., & Carati, C. (2014). Telerehabilitation for older people using off the-shelf applications: Acceptability and feasibility. Journal of Telemedicine & Telecare, 20, 370-376. doi:10.1177/1357633X14552382

Chen, J., Jin, W., Zhang, X.-X., Xu, W., Liu, X.-N., & Ren, C.-C. (2015). Telerehabilitation approaches for stroke patients: Systematic review and meta-analysis of randomized controlled trials. Journal of Stroke & Cerebrovascular Diseases, 24, 2660-2668. doi:https://doi.org/10.1016/j.jstrokecerebrovasdis.2015.09.014

Clark, R. A., Conway, A., Poulsen, V., Keech, W., Tirimacco, R., & Tideman, P. (2015). Alternative models of cardiac rehabilitation: A systematic review. European Journal of Preventive Cardiology, 22(1), 35-74. doi:http://dx.doi.org/10.1177/2047487313501093

Maddison, R., Rawstorn, J. C., Stewart, R. A. H., Benatar, J., Whittaker, R., Rolleston, A., . . . Gant, N. (2018). Effects and costs of real-time cardiac telerehabilitation: Randomised controlled non-inferiority trial. Heart. doi:10.1136/heartjnl-2018313189

**Suitable exercises could be adapted from**

Marsden, Dunn, A., Callister, R., McElduff, P., Levi, C. R., & Spratt, N. J. (2016). A home- and community-based physical activity program can improve the cardiorespiratory fitness and walking capacity of stroke survivors. Journal of Stroke & Cerebrovascular Diseases, 25, 2386-2398. doi:10.1016/j.jstrokecerebrovasdis.2016.06.007

FAME (Canadian group exercise program <https://fameexercise.com/>

Or telehealth specific: from

Galloway, M. (2019). An exploration of low doses of exercise on cardiorespiratory fitness in people with chronic stroke (Unpublished doctoral dissertation). University of Newcastle, Callaghan, Australia. http://hdl.handle.net/1959.13/1407802