

Cardiac Rehabilitation Progression

This protocol is a set of guidelines that must be followed from first contact with your patient before their surgery (pre-operative), to what needs to be done while they are in ICU, the wards, and when they attend rehabilitation as an outpatient. As with any protocol, the treatment of your patient still needs to be individualised according to their clinical status.

Pre-Operative Session

The following should be addressed when doing a pre-op session with a candidate cardiac surgery patient, and documented on the cardiac surgery pre-op form:

1. Review the protocol with your patient
2. Obtain a comprehensive past and present medical history
3. Review post-op precautions
4. Give instruction for IPPB, PEEP/Spirometry. Let your patient perform the exercises in front of you
5. No driving for 6 weeks post-op
6. Discussion on goals prior to discharge from hospital
7. Discussion on what happens after discharge from hospital i.e., cardiac rehabilitation group sessions, biokinetics referral
8. Give your patient a cardiac surgery manual as well as Dr du Toit's information pack

ICU (Phase I)

Your patient will stay in ICU for 2-3 days if no complications arise

Your patient needs to be seen bidaily (twice daily) throughout their ICU stay, unless otherwise contraindicated

Monitor your patient's vital signs throughout your treatment

It is common for cardiac surgery patients to go into atrial fibrillation (AF) after surgery

First Steps

- Check doctor's referral note for diagnosis and any precautions/contra-indications
- Discuss the patient's condition/progress with nurse regarding suitability for physio/plan of action
- Check and document patient's vitals
- Check patient's medication. Also liaise with nurses if patient needs pain medication before physiotherapy treatment
- Introduce yourself to the patient, and explain the purpose of your visit
- Check patient x-rays/scans
- Observe attachments to patient i.e., IV drips, drains, catheters, etc.

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Patient Examination

Subjective

- Past and present medical history
- Occupation
- Medication
- Smoking history

Objective

- Observation of position in/out of bed, posture, breathing rate, any signs of discomfort/respiratory distress
- Pain score (VAS)
- Check location of wound, dressings, any oozing
- Auscultation
- Chest shape, chest expansion
- Any signs of chronic cardiac/respiratory conditions i.e., clubbing, enlarged heart on CXR
- Explain your treatment plan to patient

Treatment

- Decide on appropriateness of postural drainage; Position your patient accordingly
- P/S/V should be performed for about 5 minutes (or as tolerated)
- Thoracic expansion exercises as appropriate
- PEEP (can be done in combination with manual clearance techniques, Spirometer)
- IPPB (can be done in combination with manual clearance techniques, rib springing)
- Encourage active coughing; Teach supported coughing if patient has surgical incisions; Perform assisted coughing if spinal cord injury
- Circulatory exercises where appropriate
- Pre-gait activities when appropriate, progressed to ambulation away from the bed where appropriate

Day 1 (am)

- Chest assessment and treatment as prescribed above
- Circulatory exercises as prescribed above
- Mobilise your patient sitting over the edge of the bed (while your patient is in this position, the nurse will perform pressure care and give the patient a bed wash)
- Correct your patient's posture while they are sitting at the edge of the bed
- Deep breathing while sitting at edge of bed once posture has been corrected

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- Mobilise your patient from sitting at edge of bed to standing (in this position, the nurse will continue to wash him/her if they can tolerate standing)
- Mobilise your patient to the chair (most patients can tolerate sitting for about 2 hours)
- The nurse and porter will mobilise your patient back into bed after about 2 hours

Day 1 (pm)

- Chest assessment same as in am
- Mobilise to the chair if your patient can tolerate it. If not, you can mobilise them sitting at edge of bed and do your chest physiotherapy in that position
- If they can not tolerate sitting at edge of bed, do your chest physiotherapy in the high fowler's position

Day 2 (am)

- Same as day 1

Day 2 (pm)

- Same as am
- Attempt walking around bedside if not limited by too many attachments

Day 3 (am + pm)

- Same as previous sessions
- Attempt walking $\pm 20\text{m}$
- You can start gentle upper and lower limb mobility exercises

Ward (Phase I)

Day 4 (am)

Your patient should be in the ward by now

- Discuss your patient's condition/progress with nurse regarding suitability for physio/plan of action
- Check and document patient's vitals
- Check patient's medication. Also liaise with nurses if patient needs pain medication before physiotherapy treatment
- Continue chest physiotherapy as above
- Continue upper and lower limb mobility exercises (e.g., shoulder rolls, thoracic expansion exercise with breathing control, calf raises, mini squats)
- Add gentle neck stretches
- Attempt walking your patient down the entire passage ($\pm 100\text{m}$)
- Encourage your patient to sit out in the chair during the day

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- You may do gentle massage/myofascial releases of the upper trapezeii and rhomboids (they are often tense and painful after surgery)

Day 4 (pm)

- Same as in am
- Attempt doing one flight of stairs with your patient

Day 5 (am)

- Continue chest physiotherapy and mobility exercises as above
- Add “Box” exercise for breathing control
- Stairs again-try adding another flight
- Increase walking distance

Day 6 (am + pm)

- Continue chest physiotherapy and mobility exercises
- IPPB can be weaned
- Continue breathing control
- Increase walking distance up to $\pm 200\text{m}$
- 2 flights of stairs

Day 7

Your patient will most likely be discharged on this day. Please see them first thing in the morning before discharge, and book them for cardiac rehabilitation phase 2.

If they do not live in Windhoek, please refer them to continue rehabilitation with a physiotherapist in their area.

- Chest physiotherapy, breathing control, mobility exercises
- Walking up to 200m
- 2 flights of stairs
- Give your patient the American Heart Association Six-Week Walking Programme that they can follow at home

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Outpatient Rehabilitation (Phase II)

In this phase, your patients should attend twice weekly sessions until week 6 post-surgery. You may see them for longer than 6 weeks if necessary, or not yet ready for biokinetics.

- Patients should exercise once a week at home/on their own according to our direction
- Check patients' vital signs before the start of each session, and again at the end of the session
- Allow your patients 1-2 breaks during the session (usually after the warm-up, and after the general exercises)
- The 6 MWT should have already been done before hospital discharge. If not done, please do it after taking vitals at the first rehabilitation session. This test must be repeated at their last rehabilitation session so that their progress can be compared to the first test
- Use the 6MWT worksheet to record data
- This programme is only a guideline. You still need to tailor the exercises according to the condition of your patients

Week One

Warm-up (may include one of or a combination of the following):

- 5 minutes cycling level 1
- Walking in a circle with deep breathing exercise (DBE) and thoracic expansion exercise (TEE) for 30 seconds to 1 minute

General Exercises (1-3 sets of each):

- Neck, shoulder, hip, trunk and back mobility (as per exercises depicted on wall and in pre-op manual)
- Trunk rotation with hip flexion
- Backward knee kicks with side stepping

Cool Down:

- Stretches of neck, shoulders, trunk, lower limbs (hold between 20-30 seconds each)

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Week Two

Warm-up (may include one of or a combination of the following):

- 5-10 minutes cycling level 1
- Walking in a circle with DBE and TEE for 30 seconds to 1 minute

General Exercises (1-3 sets of each):

- Neck, shoulder, hip, trunk and back mobility (as per exercises depicted on wall and in pre-op manual)
- Trunk rotation with hip flexion
- Backward knee kicks with side stepping
- Wall squats (10 repetitions)
- Static lunges (5 repetitions on each leg)
- Seated thoracic mobility (chairs lined up: passing light ball overhead, side to side, underneath chair; all forwards and backwards; 10 lengths both directions)

Cool Down:

- Stretches of neck, shoulders, trunk, lower limbs (hold between 20-30 seconds each)

Week Three

Warm-up (may include one of or a combination of the following):

- 5-10 minutes cycling level 1-2
- Walking in a circle with DBE and TEE for 30 seconds to 1 minute

General Exercises (1-3 sets of each):

- Neck, shoulder, hip, trunk and back mobility (as per exercises depicted on wall and in pre-op manual)
- Trunk rotation with hip flexion
- Backward knee kicks with side stepping
- Wall squats (10 repetitions) **OR** chair squats with thoracic extension using light ball
- Static lunges (5 repetitions on each leg) **OR** Walking lunges with thoracic rotation using light ball
- Seated thoracic mobility (chairs lined up: passing light ball overhead, side to side, underneath chair; all forwards and backwards; 10 lengths both directions)

Cool Down:

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- Stretches of neck, shoulders, trunk, lower limbs (hold between 20-30 seconds each)

Week Four

Warm-up (may include one of or a combination of the following):

- 5-10 minutes cycling level 1-2
- Walking in a circle with DBE and TEE for 30 seconds to 1 minute

General Exercises (1-3 sets of each):

- Neck, shoulder, hip, trunk and back mobility (as per exercises depicted on wall and in pre-op manual)
- Trunk rotation with hip flexion
- Backward knee kicks with side stepping
- Wall squats (10-12 repetitions) **OR** chair squats with thoracic extension using light ball
- Static lunges (5-10 repetitions on each leg) **OR** Walking lunges with thoracic rotation using light ball
- Seated thoracic mobility (chairs lined up: passing light ball overhead, side to side, underneath chair; all forwards and backwards; 10 lengths both directions)

Cool Down:

- Stretches of neck, shoulders, trunk, lower limbs (hold between 20-30 seconds each)

Week Five

Warm-up (may include one of or a combination of the following):

- 5-10 minutes cycling level 1-2
- Walking in a circle with DBE and TEE for 30 seconds to 1 minute

General Exercises (1-3 sets of each):

- Neck, shoulder, hip, trunk and back mobility (as per exercises depicted on wall and in pre-op manual)
- Trunk rotation with hip flexion
- Backward knee kicks with side stepping
- Wall squats (10-12 repetitions) **OR** chair squats with thoracic extension using light ball
- Static lunges (5-10 repetitions on each leg) **OR** Walking lunges with thoracic rotation using light ball

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- Slow jogging (3 X 20 seconds; 1 minute rest in between)
- Seated thoracic mobility (chairs lined up: passing light ball overhead, side to side, underneath chair; all forwards and backwards; 10 lengths both directions)

Cool Down:

- Stretches of neck, shoulders, trunk, lower limbs (hold between 20-30 seconds each)

Week Six

Warm-up (may include one of or a combination of the following):

- 10 minutes cycling level 1-2
- Walking in a circle with DBE and TEE for 30 seconds to 1 minute

General Exercises (1-3 sets of each):

- Neck, shoulder, hip, trunk and back mobility (as per exercises depicted on wall and in pre-op manual)
- Trunk rotation with hip flexion
- Backward knee kicks with side stepping
- Wall squats (10-12 repetitions) **OR** chair squats with thoracic extension using light ball
- Static lunges (5-10 repetitions on each leg) **OR** Walking lunges with thoracic rotation using light ball
- Slow jogging (3 X 20 seconds; 1 minute rest in between)
- Shuttle runs/walk (3 X 20 seconds; 1 minute rest in between) {works on trunk, hip, LL mobility as well as CV endurance}
- Seated thoracic mobility (chairs lined up: passing light ball overhead, side to side, underneath chair; all forwards and backwards; 10 lengths both directions)

Cool Down:

- Stretches of neck, shoulders, trunk, lower limbs (hold between 20-30 seconds each)