SPORT SCIENCE CONSULTANTS

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Richard Brennan

BACR Phase IV Case Study

SPORT SCIENCE CONSULTANTS

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section A – The Cardiac Event

1. Personal Details

Name: Mr X

Age: 76

Sex: Male

Family Status: Married

Occupation/Hobbies: Retired Army/Rugby

2. Relevant Past Medical History (non Cardiac)

- COPD/Asthma.

3. Cardiac History

- Previous Angina (5 years ago – unable to remember exact details of medication).

4. Risk Factor Profile

- Elevated Cholesterol.
- Hypertension.
- Mr X is an ex-smoker.

SPORT SCIENCE CONSULTANTS

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section A – The Cardiac Event

5. Current Cardiac Event

Brief overview of Phase I.

Mr X felt tightness and pain in his chest around 2pm Sunday. He was not sure if this was indigestion and to relieve the pain decided to perform some press-ups. The pain remained and he began to feel short of breath. His wife called 999 and asked for an ambulance. The paramedics performed an ECG which showed Mr X had suffered a STEMI. Mr X was given Glyceryl Trinitrate (GTN) to relieve the pain. Mr X was not administered Streptokinase or TPA clot busters. In hospital Mr X was given more GTN which he had an allergic reaction to. It was decided not to administer any more GTN. Mr X then had an angiogram which showed a blockage in the Right Coronary Artery (RCA). The Left Anterior Descending Artery (LAD) and the Circumflex Artery (Cx) were also slightly occluded but not enough to warrant intervention other than lifestyle changes and drug therapy. The following day Mr X underwent a Primary Percutaneous Coronary Intervention (PPCI) in the RCA and a stent was put in. Mr X stayed in hospital from Sunday evening until Tuesday morning.

Mr X was put on Statins to reduce cholesterol, ACE inhibitors to control blood pressure and Clopidogrel and Aspirin in order to reduce the likelihood of clots forming in the arteries. Mr X was not prescribed Beta Blockers due to his Asthma.

Mr X was readmitted 4 days after discharge with Pericarditis. He then stayed in hospital for a week. Since subsequent discharge from hospital Mr X has had no further pain or discomfort other than a right femoral haematoma relating to post angiogram and PCI.

Brief overview of Phase II.

Mr X was not advised on his activity levels following discharge but was told that a member of the rehab team would call him within the week to book him in for his Phase III sessions. He started his Phase III programme 1 week after being discharged from hospital. In the period between discharge and Phase III beginning he suffered no angina or dyspnoea. No furtherer investigations were scheduled.

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section A – The Cardiac Event

6. Risk Stratification

Criterion	
Extent of damage	
• **Anterior MI**	No.
• **Previous MIs**	No
• **Large Infarct (enzymes++)**	No
• **Complicated recovery**	Yes. Pericarditis – readmitted to UCH 4 days after discharge.
Pumping capacity	
• **LV Function- mod/poor**	Good. 61%.
• **Presence of heart failure**	No
Ischaemia	
• **Positive ECG ETT**	No test.
• **Ongoing angina**	No
• **Awaiting further investigations**	No
Other	
• **Arrhythmias**	No
• **Cardiac Arrest – secondary event**	No
RISK STRATIFICATION DECISION	Low risk. Accept.

Risk Stratification Rationale

Mr X has had no previous M.I.'s prior to the event in January 2011 and although he suffered an M.I. it was not a large infarction and it was not anterior.

Mr X also has no absolute contraindications to exercise. He has good left ventricular (L.V.) function measuring 61%. This would suggest that the damage to the heart, particularly to the left ventricle, is not severe. He has no ongoing angina and is not awaiting any further investigations.

He also walks regularly with his dog, attended all Phase III exercise sessions, is a previous gym user and enjoys exercise saying he was 'motivated with his exercise programme'.

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

7. Medications

Generic Name	Effect	Exercise Considerations
ANTI PLATELET Aspirin	Decrease platelet aggregation (or stickiness) that may stop clots forming in the arterial side of the circulation.	None.
ANTI PLATELET Clopidogrel	Similar action to aspirin.	None.
ACE INHIBITOR	Reduces afterload. Circulating volume is reduced.	Possible increase in exercise capacity in individuals with heart failure. Rapid changes in posture or abrupt cessation of exercise will increase risk of hypotension.
STATINS	Control levels of cholesterol and triglceridesin the blood.	Gastrointestinal upsets. Muscle pain. Headaches. Aching legs.

Section B – Exercise Prescriptions

8. Previous Activity Level

Mr X played rugby regularly when he was young. Career in the army. Physical activity a major part of his life. Recently his physical activity consists of regularly walking his dog and doing simple home exercises such as press-ups.

9. Phase III

- 15/02/2011
- 1 month after event.
- Hospital based at the Hatter Institute, UCLH.
- Education programme for 90 minutes on healthy eating and healthy lifestyle.
- Staff consisted of Cardiac Nurse & Physiotherapist
- Ratio 8-2 (8 patients – 2 staff)

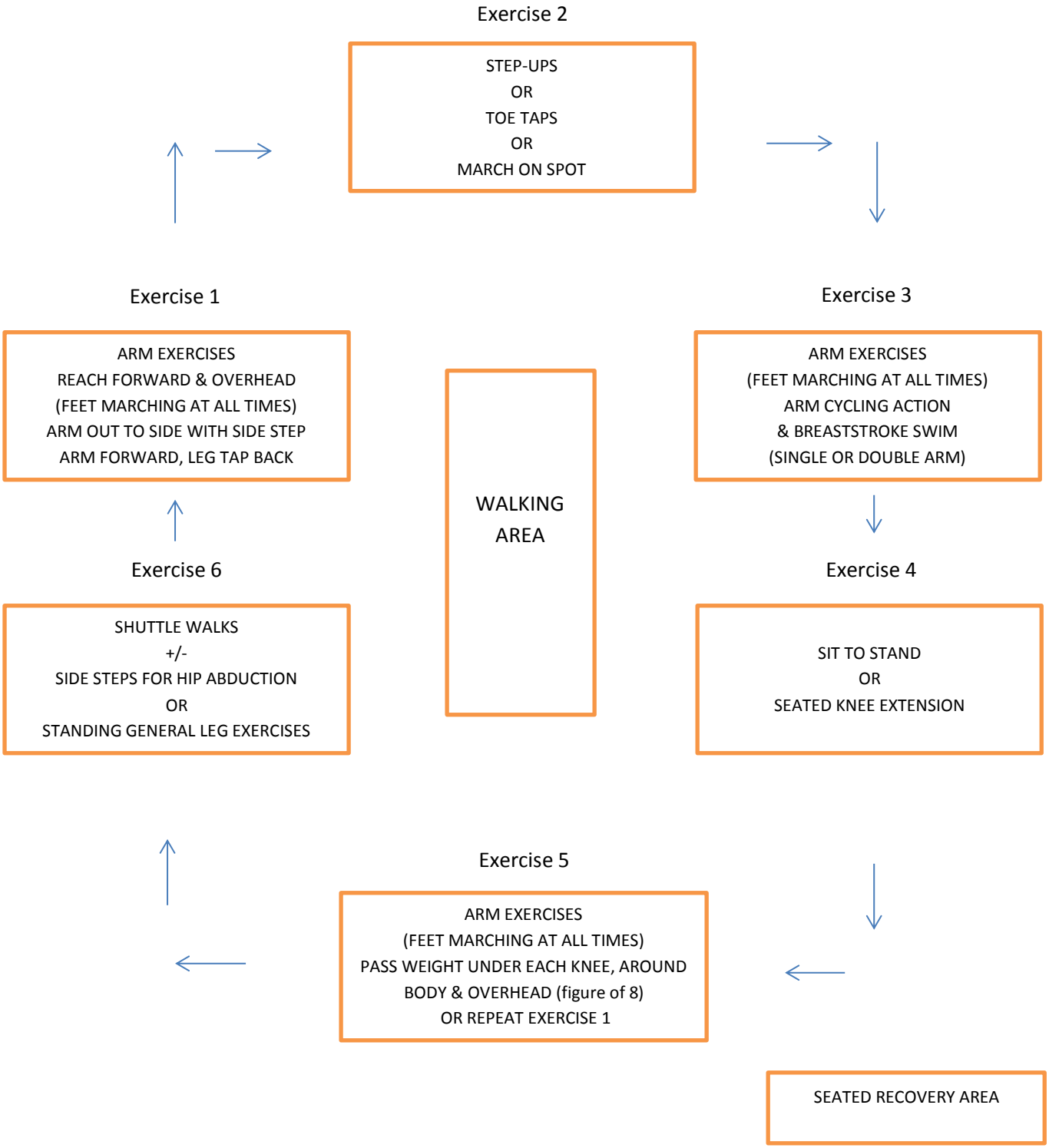
SPORT SCIENCE CONSULTANTS

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section B – Exercise Prescriptions

9. Phase III (cont.)

Floor Plan



SPORT SCIENCE CONSULTANTS

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section B – Exercise Prescriptions

10. Phase III Critque

CRITERIA	DESCRIPTION	POSITIVE CRITIQUE	NEGATIVE CRITIQUE
The length & content of the warm-up	15 minutes duration. Walking around central walking area (CWA) focussing on picking up heels >walking on the spot Nurse explains purpose of warm-up to patients > Shoulder mobilisations whilst keeping feet moving. Nurse explains good posture > Forward reaches then breaststroke (feet moving) > Toe taps with chairs available to help balance > Neck mobilisations, side bends, unilateral arm raises, tricep stretches > ankle mobilisations, knee flexion and calf stretches.	Included mobility and preparatory stretchingwhich is important to identify tight muscles, encourage good balance & alignment. Moving the feet whilst stretching upper body ensures HR does not drop. Walking around central area in between lower body stretches also ensures elevated HR maintained.	Re Pulse raising: The movements did not seem to increase in intensity. This is necessary to trigger all 3 mechanisms for increasing coronary blood flow (local chemical changes, norandrenaline and increased aortic pressure.
The content of the conditioning component	Group split in to 2. BORG RPE scale 6-20 shown and explained. Both groups walk around CWA (4 minutes). Group 1 then performed seated exercises with bean bags whilst Group 2 performed step-ups on steps. Group 1 move to step-ups Group 2 move to standing bean bag exercises (in the seated area but with the chairs removed). Group 1 then move to seated area and perform bean bag exercises (keeping feet moving) whilst Group 2 move on to stationary exercise bikes (4 minutes).	It is important to include aerobic exercise as (when performed regularly and consistently) this can lead to positive functional, structural and biochemical changes in skeletal muscle, the heart and circulation.	Bike seat heights were not recorded. Each week patients waited whilst the seats were adjusted. Meant HR would drop out of conditioning range..
Structure of the circuit programme	Aerobic exercise interspersed with periods of muscular strength & endurance (MS&E) work.	This type of interval training produces a greater volume of aerobic exercise than may be achieved when aerobic exercise is continuous.	RPE should have been used more often to determine whether patients were moving into/out of intense/recovery periods.
The content of the cool-down	Patients in 1 group standing in a circle with both instructors in circle> keeping legs moving, various stretches neck, triceps, pecs, quads, hamstrings, calf. Nurse talking through BORG Scale and purpose of cool-down. Cool-down lasted 10 minues.	Abrupt cessation of exercise can lead to reduced venous return and a greater potential for hypotension, arrhythmias and ischaemia.	1 patient was recovering in the seated area then joined cool-down exercises which may have had the opposite effect and elevated her HR since she was very unfit. RPE not asked.
Monitoring intensity of patients	12 Borg scales were placed around the room in full view on the walls. Occasionally patients were reminded about the Borg scale and asked what number they considered themselves to be on.	Having the Borg 6-20 scale in view of the clients helps to remind them what number pertains to what intensity. For the warm-up the intensity should be between 10-11 on the 6k-20 scale, the conditioning component intensity should be between 10-15 (12-13 corresponds to approx. 60% of Max HR) and the warm-down should end between 10-11.	Borg scale was not used after each station. Patients did not refer to the wall mounted scales nurse should question verbally. Too low intensitythe aerobic benefits are not conferred, too high = patient may experience discomfort or may not be able to adequately supply sufficient oxygen to the working muscles including the heart.
Progression of the conditioning component	The exercises moved from more intense to less intense and to rest for those who needed to recover. Each section was timed.	Bean bags came in varying weights and steps came in different heights allowing patients to work at their own intensity.	Some exercises could have been prepped e.g. steps and bike seat heights. This would ensure the session was not interrupted and optimum HR maintained.
Individualisation of exercise prescription	Group split into 2. More fit & less fit. Each exercise could be progressed and modified. Patients shown progressions and given responsibility to progress should they feel able to.	The exercise session must not provoke an adverse event in any client. Each client assessed and session flexible enough to accommodate varying needs.	Patients medication change change over time but no-one was asked if there had been any changes.

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section B – Exercise Prescriptions

1. Phase III Critque

Management of the circuit	Circuit monitored closely, all patients observed from all areas of the studio. Cardiac nurse carried stopwatch, all equipment easy to get to. Seated recovery areas with water close by, all instructions spoken clearly. No music.	Any patient experiencing discomfort could be observed	Patients who used GTN spray were not asked to sit down afterwards. This could lead to a hypotensive episode.
Total CV time achieved	Approximately 15 minutes by my case study.	A stop watch was used to time each station. This meant the interval training period had set times of CV work, active recovery or rest for the less fit group.	No times were recorded. The eventual goal is continuous CV training. Recording patients CV time would show whether they were progressing from one week to the next.
Supine floor work	No supine floor work included in circuit.	**N/A**	**N/A**
Client observation post the exercise class	Patients directed to seated area in reception where they sit for 5-10 minutes in view of staff before they leave the building.	The risk of hypotensive episodes and arrhythmias lasts for some time after exercise stops. It is safer to observe the patients during this time than it is to have them travel home alone during this period.	5-10 minutes is not sufficient. BACR recommends 15-30 minutes. Some patients waited only 1 or 2 minutes before leaving and were not monitored. Also if patients HR has not returned to within 10 bpm of their pre-exercise HR then they might need to reduce the intensity of their next exercise session.
Appropriate muscle balance	The programme contained pushing away exercises and pulling in exercises for the upper body working the chest and the back as well as the triceps and the biceps. There were abduction and adduction movements for the lower body as well as hip flexion and hip extension working the abductors, adductors, hip flexors and hamstrings. The myocardium was also challenged by the CV content.	Including such a wide range of exercises ensure no joint is overworked or overlooked.	Some patients sat out e.g. hip extension exercises due to fatigue which meant they missed that particular movement entirely and did not make it up later on.

Section B – Exercise Prescriptions

11. Psychological and Social Considerations

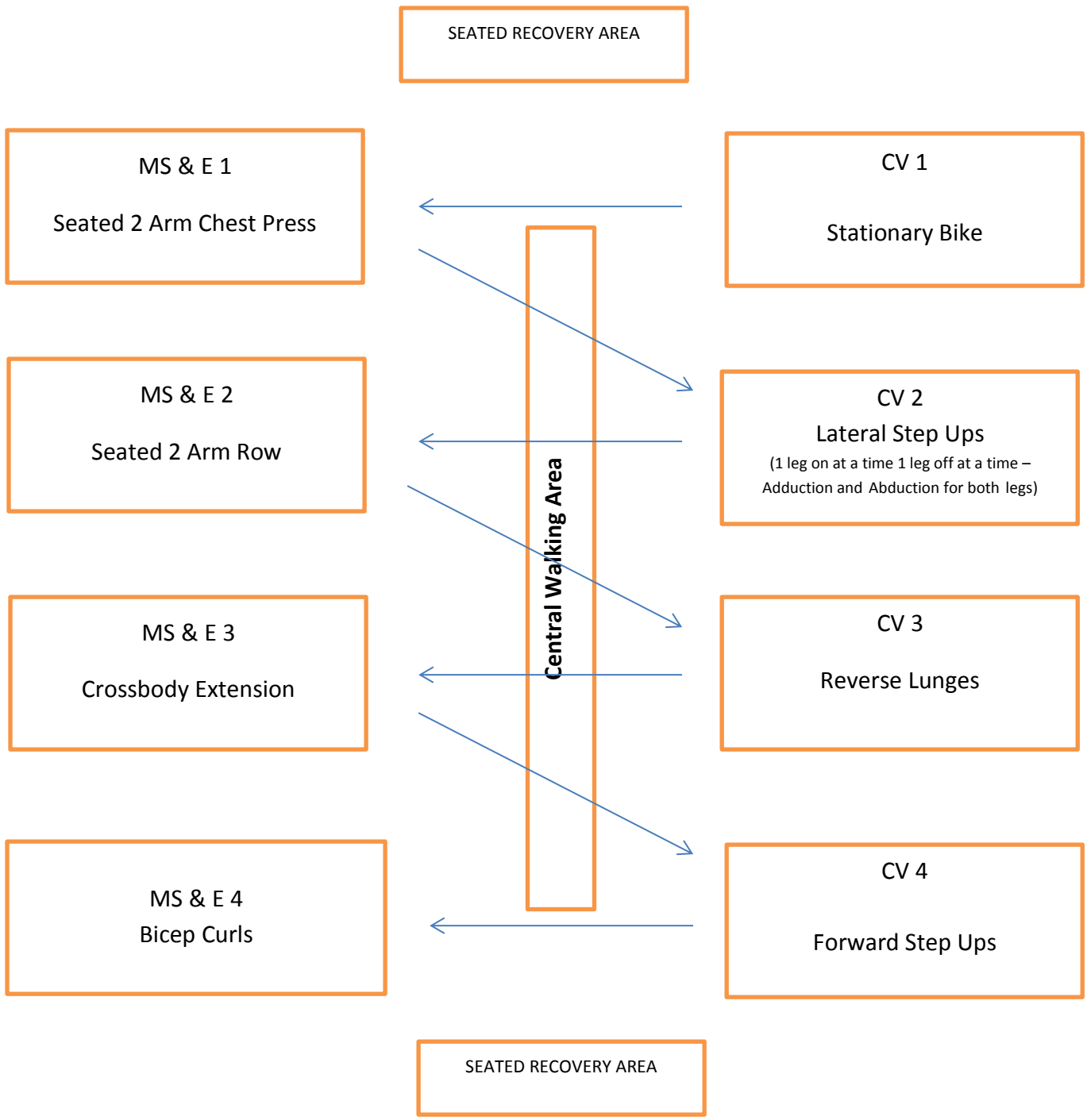
Mr X lives walking distance from his nearest Phase IV centre. He will not have to take time off work to attend. His wife is very supportive and he is highly motivated to attend. He perceives himself as fit for his age but is very keen to improve his fitness.

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section B – Exercise Prescriptions

12. Phase IV Group Circuit

Floor Plan



SPORT SCIENCE CONSULTANTS

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section B – Exercise Prescriptions

12. Phase IV Group Circuit

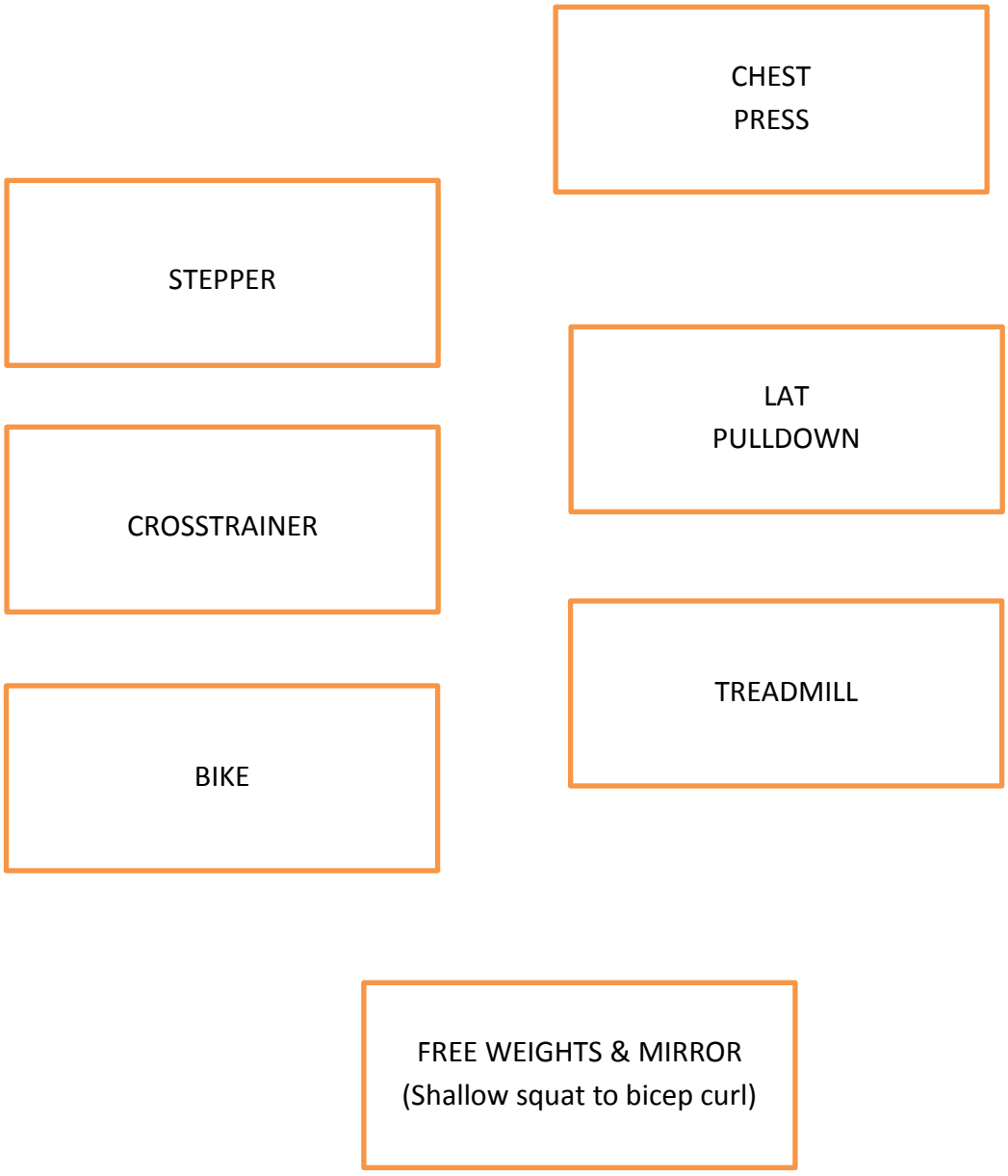
Description

WARM-UP		
Walking on the spot	Light intensity – talking about RPE anchoring reference point.	4 minutes
Mobility Exercises keeping feet moving		3 minutes
Walking up and down central walking area		4 minutes
Stretch major muscle groups then re-warm keeping feet moving		4 minutes
MAIN COMPONENT		
4 CV Stations 4 MS & E stations 1 Central Walking Area (CWA) 2 seated recovery areas (SRA). Level 1 provides 1 minute at each station with 3 circuits. = 12 minutes CV time. Level 2 provides 1 minute at each CV station alternated with (30 secs at MS & E station + 30 secs CV Walk in CWA) with 3 circuits = 18 minutes CV time. Level 3 provides 1 minute at each CV station alternated with 1 minute CV Walk in CWA with 3 circuits = 24 minutes CV time. This means all participants move around the circuit together which prevents overcrowding at stations.		
COOL DOWN		
Walking slowly in CWA	Instructor goes through RPE using Borg Scale 6-20.	
Upper Body Mobilisations walking on the spot	Talking about importance of keeping feet moving to help venous return.	
Lower Body Stretches interspersed with walking on the spot	Reminding participants to stay for 15 minutes in monitored seated area before leaving.	

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section B – Exercise Prescriptions

13. Phase IV Individual Programme
Floor Plan



SPORT SCIENCE CONSULTANTS

Contact us:
Richard@sportscienceconsultants.com
Tel: 07886 398 577

Section B – Exercise Prescriptions

13. Phase IV Individual Programme Description

WARM-UP		TIME
Treadmill		4 minutes
Mobility Exercises		3 minutes
Bike		4 minutes
Stretch major muscle groups then re-warm		4 minutes
MAIN COMPONENT		**REPS - TEMPO - TIME**
Treadmill		4 minutes
Lat Pulldown		15 2-1-2 75 secs
Crosstrainer		4 minutes
Chest Press		15 2-1-2 75 secs
Stepper		4 minutes
Shallow squat to bicep curl		15 2-1-2 75 secs
Bike		4 minutes
COOL DOWN		
Treadmill	Reducing intensity to bring down HR and RPE.	5 minutes
Upper Body Mobilisations walking on the spot		5 minutes
Lower Body Stretches interspersed with walking on the spot		5 minutes