SISFFIT033

Complete client fitness assessments



Learner resource

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ABOUT THIS DOCUMENT

The notes provided are basic and generic only and there is an expectation that learners may need to:

- Undertake research
- Ask questions of their trainer/assessor or other individuals
- Draw on experience and/or information that may be gained in the workplace or through communication with a workplace.

In many cases the information provided in this document will meet the requirements for theory answers, or provide enough background information for the learner to research or develop an answer.

In some cases information from other sources has been provided, and where this is done details of the original source will be provided and where possible a URL.

The process you should undertake for assessment activities is:

- Read the sections of this document referred to in the specific question/activity
- Where additional advice/instruction/assistance is needed contact your assessor for guidance and support

DISCLOSURE

The information provided in this document is considered to be in line with industry standards, and or as researched or procured from various sources, but does not necessarily endorse or agree with all details, opinions or results. It is noted that there are varying opinions, theories, and sources of information, and information supplied herein as a resource to complete the courses the resource has been designed for in line with the relevant training packages.

It is not suggested that the information provided here is better than or more preferred than other resources or information that may be available. It is acknowledged that there may be other opinions or theories, however, assessment activities in this course are based on the information provided herein and it is against that information that assessment responses/answers/evidence will be assessed an competency determined.

It is recommended that for ongoing circumstances after course completion learners and industry personal conduct their own research and liaise with industry experts and organisations then form their own opinion based on what they have discovered, and what is relevant to their environment and circumstances.

- **The information in this document is relevant for the completion of this course**
- **Alternate or different views I'm not discounted, but are not relevant for the completion of this course**
- **To ensure consistency, it is the information within this course that is relevant for assessment activities**

SOURCES OF INFORMATION

Information has been researched and gained from many areas and sources and the main ones will be acknowledged here as is legally and morally required. A great deal of information comes from open source and is covered under creative commons. Notable sources are

Wikipedia – http://en.wikipedia.org/wiki/Main_Page

Cliff Notes – www.cliffsnotes.com

About.com – http://biology.about.com/od/anatomy/a/aa072007a.htm

University of Sydney – http://www.anatomy.usyd.edu.au/glossary/

Human Physiology – http://people.eku.edu/ritchisong/301notes1.htm

Human Kinetics (http://www.humankinetics.com/)

AusActive (http://www.fitness.org.au/scripts/cgiip.exe/WService=FITNESS/ccms.r)

Australian Sports Commission (http://www.ausport.gov.au/)

Live science http://www.livescience.com

Web MD http://www.webmd.com

About exercise http://exercise.about.com

Passion4 Profession http://www.passion4profession.net

Body building.com http://www.bodybuilding.com

The Better Health Channel - http://www.betterhealth.vic.gov.au/bhcv2/bhcarticles.nsf/pages/Joints

PRE-EXERCISE SCREENING

By completing a pre-exercise screening of each client, you are reducing the risk and liability of providing fitness programs to clients. As a fitness professional, it's important that you fully understand your client and the health risks and possible diseases they may have prior to beginning a fitness program. This will provide a structured service to the client and will help prevent and serious injury or complications.

Pre-exercise screening should include the following documentation:

- Health history questionnaire
- Physical activity readiness questionnaire
- Risk stratification
- Informed consent

Pre-exercise health screening allows a targeted approach where the well-being of the client is protected and where appropriate exercises and/or activities can be undertaken to suit the client's circumstances

DOCUMENT AND UPDATE RECORDS OF FITNESS ORIENTATION, PRE-EXERCISE SCREENING, FITNESS APPRAISAL AND ADVICE PROVIDED TO CLIENT.

It is important that Fitness businesses must ensure that proper records are kept and respect the privacy of their customers is maintained.

Fitness businesses should, where practical, keep a record of each customer and user of facilities.

Proper records means customer records that clearly and legibly detail material information about each customer having regard to the services and facilities provided to the customer.
This will include personal information for billing and administrative purposes, relevant health information, results of fitness assessments and tests, and activity records. Because this is personal (and in some respects sensitive) information fitness businesses will need to take care to store this information securely and protect it from unauthorised access, inform clients how their information will be handled, used and shared with others, and otherwise comply with applicable privacy laws.

Fitness businesses and professionals should be familiar with their obligations under the Privacy Act 1998 (including the Australian Privacy Principles) and have appropriate policies and processes in place to ensure compliance with all applicable privacy laws. Fitness businesses should maintain secure client pre-exercise screening and assessment records for 7 years. See relevant Privacy Legislation1 information.

WHAT ARE THE AUSTRALIAN PRIVACY PRINCIPLES?

1. Open and transparent management of personal information.
2. Anonymity and pseudonymity.
3. Collection of solicited personal information.
4. Dealing with unsolicited personal information.
5. Notification of the collection of personal information.
6. Use or disclosure of personal information.
7. Direct marketing.
8. Cross-border disclosure of personal information.
9. Adoption, use or disclosure of government related identifiers.
10. Quality of personal information.
11. Security of personal information.
12. Access to personal information.
13. Correction of personal information.

CLIENT CONFIDENTIALITY AND PRIVACY OBLIGATIONS

The Office of the Australian Information Commissioner (OAIC) is an Australian Government statutory agency within the Attorney General's portfolio. It is responsible for freedom of information, privacy and information policy functions and provides information and advice to individuals, businesses and agencies www.oaic.gov.au

WHO DOES THE PRIVACY ACT APPLY TO?

All organisations that provide a health service are covered by the Privacy Act (whether or not they are small businesses). Organisations providing a health service include:

- Traditional health service providers such as private hospitals and day surgeries, doctors and specialists.
- Pharmacists.
- Allied health professionals.
- Complementary therapists.
- Other services like gyms, fitness services and weight loss clinics, child care and schools (if they provide a health service and hold health information).

HEALTH-FOR-SERVICE-PROVIDERS

The Privacy Act requires entities to take 'reasonable steps' to protect the personal information that they hold from misuse, loss and from unauthorised access, use, modification or disclosure.

RECORDING AND UPDATING RELEVANT INFORMATION

Why keep client records?

Client records are a vital part of any fitness business as they are beneficial in a number of ways including:

- A more targeted approach for specific clients
- Benchmarks against which progression and improvement can be measured, all for the use of goal setting
- Can be used in communication with the client
- May be required as evidence in some future complaint or action

- Can be used in statistical analysis for and planning

- In some circumstances are a legal requirement

Good records provide protection and insight into your service and business.

What needs to be recorded?

Relevant information which may include:

- Personal details of clients
- Results of orientation, screening, and fitness appraisal
- Health and lifestyle information
- Relevant communication
- Referrals to or from Allied health professionals, fitness professionals, or other relevant individuals

How do you record the information?

There are a number of ways information can be documented, recorded and stored which might include:

- Screening forms
- Client notes and files
- Checklist
- Audio devices
- Video devices
- Hand written notes or reports

How do you store the information?

Whatever method you use, it must be secure and ensure an individual's privacy and confidentiality is maintained. There must be systems in place to ensure that the individual's information cannot be accessed by any unauthorised person.

Mediums of the storage of information may include:

- Printed or written documents stored in a secure location, for example in a locked filing cabinet in a locked office where only authorised persons and have access.

- Electronically in a secure storage environment (could be in the form of documents, spreadsheets, or data entered into a specific program, for example a student management system).

- Using a contract organisation which specialises in securing documentation or records either physical or electronic.

The benefits of keeping client records?

The benefits of keeping client records include:

- A more targeted approach for specific clients
- benchmarks for progression and improvement
- they may be required as evidence in a future complaint or action

METHODS OF DOCUMENTATION/RECORD-KEEPING

Documentation and record keeping can be undertaken through a number of methods which may include but not be limited to:

- Written records
- Photographic records
- Video records
- Audio recordings
- Scanned documents
- Electronic records

Recommendations for the improvement of customer service should be recorded and provided to relevant stakeholders in line with organisational requirements

SUBMITTING RECOMMENDATIONS FOR CUSTOMER SERVICE IMPROVEMENT

Submitting recommendations for customer service improvement may be undertaken in a number of ways depending on organisational requirements and other factors. Methods and strategies for submitting recommendations may include but not be limited to:

- In line with organisational policies, procedures, and standards
- Written relevant managers, supervisors, panels, boards, et cetera
- Verbally system to relevant managers, supervisors, panels, boards, et cetera
- Electronically through an intranet, or pro forma

CLIENTS WITH SPECIAL NEEDS

When talking about clients with special needs and requirements we are not only talking about meeting the needs of people with disabilities, but also clients such as small children, mothers with prams, people with little or no English etc. There are many instances where people may have a special need.



If clients are treated as individuals all of the time, then meeting the special needs and requirements of our customers will be a natural part of client service.

As approximately 18 per cent of the community are considered to have a disability, there are a number of general **DO'S** and **DON'TS**.

DO'S when talking to people with disabilities	
DO	Establish and maintain eye contact as much as possible.
DO	Face and speak directly to the person rather than through the companion/attendant/sign language interpreter who may also be present.
DO	Always respect the person's dignity, individuality and desire for independence. If help is required in a given situation, do not assist without asking first.
DON'TS when talking to people with disabilities	
DON'T	Stereotype people.
DON'T	Expect people with special requirements to display a specific type of personality. People with disabilities are people first, with feelings, emotions, desires, aspirations, frustrations and needs just like anyone else.
DON'T	Speak about the person as if he/she is invisible, cannot understand what is being said, or can't speak for him/herself.
DON'T	Put people with a disability on a pedestal or talk to them in patronising terms as if performing normal, everyday activities were exceptional for them.

As with all good client service, remember:

- Use active listening
- Clarify what the customer's needs are through good questioning
- Confirm you have understood what is required

PROVIDING FOR SPECIFIC NEEDS CLIENTS

To assist clients with special or specific needs there may be a need to adjust or vary the approach or seek assistance from elsewhere and appropriate actions may include but not be limited to:

- Seeking guidance from a medical or allied health professional
- Referring the client to a more appropriate service
- Varying or adjusting the intended fitness or sport regime by utilising principles including:
    - Adaption
    - Overload
    - Specificity
    - Individualization
    - Progression and regression
    - Reversibility
- Utilising alternate or different equipment to meet the specific needs
- Adjusting elements frequency, intensity, type, and time to meet individual needs or limitations

In a nutshell, you need to tailor the program to meet the specific needs and limitations of the individual client in a manner which is safe and progressive and ensures their ongoing well-being.

When providing services for specific needs clients it is important to ensure that you do so ethically and legally and in line with organisation values and requirements.

MEDICAL AND ALLIED HEALTH PROFESSIONALS

Allied health professions are health care professions distinct from dentistry, optometry, nursing, medicine, and pharmacy. One estimate reported allied health professionals make up 60 percent of the total health workforce. They work in health care teams to make the health care system function by providing a range of diagnostic, technical, therapeutic and direct patient care and support services that are critical to the other health professionals they work with and the patients they serve.

Allied Health professionals may include but not be limited to:

- Sports physician
- Sports doctor
- General practitioner
- Physiotherapist
- Accredited exercise physiologist
- Occupational therapist
- Remedial massage therapist
- Chiropractor
- Osteopath (GP referral required)
- Accredited practicing dietician
- Psychologist
- Continence nurse advisor (GP referral required)
- Podiatrist
- Aboriginal health worker (GP referral required)
- Medical Specialist (GP referral required)

INDICATIONS AND CONTRAINDICATIONS

In medicine:

An **indication** is a valid reason to use a certain test, medication, procedure, or surgery

A **contraindication** is a condition or factor that serves as a reason to withhold a certain medical treatment

In sport and fitness such advice from allied health professionals indicates a type or exercise or training that should be undertaken (indication) or should be avoided (contraindication). For example, a doctor might provide a contraindication for weight bearing exercise for someone recovering from knee surgery, but might indicate a need to range of motion and mobility exercises as part of the rehabilitation process.

Sometimes an indication refers to the outcome of a condition and the limitations or symptom this may pose. For example, an indication of a broken leg is that it will be unable to support weight bearing exercise and therefore non-weight bearing activities are recommended.

Employed medical practitioner

Medical practitioner who reported that he or she worked mainly, or only, in his or her state of registration, in medicine, in the week before the survey for pay, commission, payment in kind or profit. In this report, data on employed medical practitioners include those who are:

- Practising medicine
- Involved with work that is principally concerned with the discipline of medicine (including medical research, administration, or teaching of medicine)
- On leave for less than 3 months.

Hospital non-specialist

A medical practitioner mainly employed in a salaried position in a hospital who does not have a recognised specialist qualification and who is not in training to gain a recognised specialist qualification. It includes interns, resident medical officers, career medical officers and other salaried hospital practitioners.

Main occupation

Main occupation refers to the type of medical work undertaken by an employed medical practitioner. Occupations are divided into two main groups, with categories in each group, as follows:

Clinician: A medical practitioner who spends most of the total weekly working hours mainly engaged in clinical practice (that is, diagnosis and/or treatment including recommending preventive action to patients) is classified as a clinician. It includes:

- Primary care practitioner
- Hospital non-specialist
- Specialist
- Specialist-in-training and from 2006
- Other: a clinical job function in medicine which is not one of the above.
- Non-clinician: A medical practitioner who is not a clinician. It includes:
    - administrator: employed in medical administration
    - teacher/educator: teaching or training persons in medicine
    - researcher: engaged in medical research

- public health physician: engaged in identifying disease and illness, along with their treatments and any preventive measures that affect the health of the general public
- occupational health physician: engaged in identifying disease and illness, along with their treatments and any preventive measures arising from particular fields or industries
- other: a job function in medicine which is not one of the above.

Medical practitioner

A person whose primary employment role is to diagnose physical and mental illnesses, disorders and injuries and prescribe medications and treatments that promote or restore good health.

Primary care practitioner

In the AIHW Medical Labour Force Survey, primary care practitioners are defined as medical practitioners who reported that they were employed at the time of the survey, they spent most of their time working as clinicians in the week before the survey, and their main area of clinical practice was primary or general care.
Primary care practitioners who identify as such are asked to further identify themselves as a vocationally registered general practitioner, an RACGP trainee or other.

Specialist

A medical practitioner with a qualification awarded by, or which equates to that awarded by, the relevant specialist professional college in Australia to treat certain conditions (defined in the questionnaire). You cannot directly refer a client to a specialist, and would need to have them seek a GP referral.

Specialist-in-training

A medical practitioner who has been accepted by a specialist medical college into a training position supervised by a member of the college. They are self-identified on the questionnaire. You cannot directly refer a client to a specialist, and would need to have them seek a GP referral.

State or territory

A State or territory is the State or Territory of the main job of the medical practitioner, being the job in which they report working the most hours.

Updating

Updating and recording the details/results of evaluation and modification of programs should be undertaken:

- In line with organisational policies and procedures
- As legally required
- Electronically/in writing/or other approved method
- With version control

WHEN TO REFER A CLIENT TO MEDICAL OR ALLIED HEALTH PROFESSIONALS

You should always refer your client to a health care professional when:

- A contraindication is identified through:
    - The screening questionnaire
        - client is a smoker
        - client is using medication
    - Client response/request
- When the client is a male over 45 or a female of 55
- Where there is any concern for the client's health and well being

Remember, that you might not always be able to directly refer a client to a particular allied health professional, for example you cannot refer to a specialist and you would need to refer your client to a GP to confirm the need and obtain a referral to the relevant specialist.

ORIENTATION AND HEALTH SCREENING

(Pre-activity Assessment)

ORIENTATION

According to dictionary.com (http://www.dictionary.com/browse/orientation) there are a number of meanings to the word orientation, and in the context of the fitness industry and this course the correct definition is:

An introduction, as to guide one in adjusting to new surroundings,employment, activity, or the like: "New employees receive two days of orientation."



Therefore, we are talking about a fitness professional introducing someone to a particular fitness environment and the orientation may include:

- Greeting
- Providing information on the fitness/sport environment and its services
- Answering questions
- Showing potential clients around the facilities

In other words an orientation is about introducing your service and its facilities to new or potential clients and in doing so allowing them to make informed decisions on what services they may wish to participate in. From a business perspective, an orientation may also be where the benefits of the service can be sold to potential clients, and where post sale service is delivered to new or existing clients.

GREETING

First impressions count, and when greeting a client it is important to:

- Be friendly
- Smile
- Be polite
- Be punctual
- Listen
- Answers questions openly and honestly

Consider how you would like to be greeted in the same circumstance, and show the same level of respect that you would demand yourself.

Potential or existing clients might not complain at that time, but may simply leave and never return. There is an old adage about customer service:

“Please a client and they tell 3 people, upset a client and they tell 15!”

Poor customer service can destroy a business.

COMMUNICATION WITH CLIENTS

Communication may be:

- Verbal
- By written format, such as handwritten, electronic (e.g. Email) or hard copy (e.g. Letter)
- By telephone
- Face-to-face
- Varied according to the needs of the client including:
    - Use of appropriate voice tonality and volume
    - Use of languages other than english
    - Use of a family interpreter
    - Use of basic gestures
    - Use of visual aids such as photographs, sketches or product information sheets
    - Formal
    - Informal using abbreviations
- Non-verbal communication
    - Body language
    - Dress and accessories
    - Gestures and mannerisms
    - Use of space
    - Culturally specific communication, customs and practices.
    - Eye contact

PROVIDING INFORMATION

When you are providing information to clients you should do so politely, and only after you have asked the client if they would like this information. For example, you might have a pamphlet about the services in the centre, and it would be appropriate to ask the client if they would like a pamphlet containing the information which they could take away and view at their leisure. Never insist that clients take something, as not only is this rude, but they may resent it even if they don't say so.

If you are too pushy, you may make the client is uncomfortable and they may never return.

Information that clients may be interested in may include but not be limited to:

- Cost
- Available services
- Trading or access times
- Resources and facilities
- Membership benefits
- Crèche
- Reputation and/or testimonies
- Experience and qualifications of staff
- Areas of specialisation
- Details of approach or strategies in the delivery of fitness/sport services
- Membership of relevant associations or other organisations
- Insurance
- Other relevant information or policies

You can supply information to learners a number of ways including but not limited to:

- Verbally (face-to-face, meeting, by phone)
- Pamphlets or fact sheets
- Booklets or other documents
- Electronically through emails, or multimedia
- Slideshows presented individually or in group sessions
- Forums
- Individual quotes and/or information packs

Another old and valuable adage is:

"Concentrate on the service and your business will grow, concentrate on money and your business will go!"

Sustainable and profitable long-term business comes from retaining existing clients and gaining new ones, something very much determined by an organisation's reputation, which in turn comes from its own actions on customer service and support.

ACTIVE LISTENING

Listening is one of the most important skills you can have.

Active listening is a communication technique used in the industry, training and conflict resolution, which requires the listener to feed back what they hear to the speaker, by way of re-stating or paraphrasing what they have heard in their own words, to confirm what they have heard and moreover, to confirm the understanding of both parties.

MEDIUMS OF COMMUNICATION

Medium of communication may be via:

- Letter
- Promotional materials such as newsletters
- Fax
- Email or other electronic communication
- Simple written messages, such as writing down the price of display items or telephone messages
- Face-to-face
- Telephone
- Two-way communication systems
- Standard forms and proformas
- Assistive technology, e.g. telephone typewriter (TTY).

PROTOCOLS AND ORGANISATION PROCEDURES FOR MEDIUMS OF COMMUNICATION

- Modes of greeting and farewell
- Addressing the person by name
- Required timeframe for addressing and serving clients
- Required timeframe for response to an enquiry
- Style manual requirements
- Use of standard letters
- Use of proformas e.g. tickets, labels, signs and quotations
- Relationship with referral organisation.

It is important to always follow the Organisational policies and procedures when dealing with clients. Some of these items may include:

- Records management
    - The application is in relation to managing and monitoring business and records systems or work carried out in specialist recordkeeping environments, such as archives.
    - While these people will work closely with other staff members throughout an organisation, they may also have a degree of individual responsibility and autonomy
- Privacy
    - protecting your personal information and recognise the trust placed in another when you supply your personal information to them.
- screening of clients
    - Proper *screening* and risk stratification of *clients* who are starting exercise programs is important for promoting exercise safety and preventing adverse event
- Referral requirements.
-
    - Referral requirements represents agreed methods and processes for connection and collaboration between health and *fitness* disciplines

PROVIDING THE CLIENT WITH INFORMATION ON AVAILABLE PROGRAMS, SERVICES AND FACILITIES IS DONE BY:

Conducting an orientation and providing information on services to the client verbally, in writing, or electronically

Contacts

The contact links for the peak bodies mentioned are:

Ausactive (formally Fitness Australia) https://fitness.org.au

Exercise and sports science Australia https://www.essa.org.au/

Sports Medicine Australia https://sma.org.au/
4

Physical activity Australia https://www.physicalactivityaustralia.org.au/

You have been provided with the following documents for your reference and practice along with this learner guide:

- Australian adult pre-exercise screening fact sheet
- Australian adult pre-exercise screening textbook
- Australian adult pre-exercise screening tool – user guide
- Australian adult pre-exercise screening tool
- PSA exercise pre-screening questionnaire

LIMITATIONS IN ADRESSING CLIENT NEEDS:

Identifying the limitations in addressing customer needs can be determined by undertaking a needs analysis against the identified needs, goals, expectations, and so forth.

Limitations in addressing client/customer needs may include but not be limited to:

- Insufficient technical expertise or qualifications
- Lack of experience
- Lack of sufficient, available, or appropriate resources
- Scheduling or timing issues
- Client/customer hesitance or resistance
- Legal or cultural limitations or issues

Where these limitations or barriers have been identified it may be necessary to seek assistance or guidance. This may see communication or request for assistance and support from individuals or groups which include but may not be limited to:

- A relevantly qualified/experienced individual
- An industry peak body or relevant association
- Medical and or allied health professionals
- Legal or other compliance advisors or experts
- Government departments or relevant agencies
- Community or support organisations

DEALING WITH CUSTOMER COMPLAINTS:

When dealing with customer complaints it is important to follow a complaints and appeals procedure which meets organisational and legal requirements. This may include:

- Organisational policies, procedures, and best practice policies
- Industry codes of practice or conduct
- Legislative requirements

CLIENT DISSATISFACTION, CONFLICTS OR COMPLAINTS

A very important component of quality service is the ability to quickly resolve a client's dissatisfaction with the services they may be getting or resolving conflicts or complaints.

A client's view on the professionalism of their fitness instructor or trainer can be used to anticipate their changing needs or preferences and make adjustments to ensure the client is satisfied at all times with the service they are being provided.

This same skill of anticipating client's needs is needed to also anticipate the client's dissatisfaction. It is important to remember that not all client's verbalise their dissatisfaction about something, but often there are signs that there is something wrong.

Some of the more common signs are:

- Missing sessions for no real valid reasons
- Client looking indifferent or uninterested during workouts
- Leaving earlier from session for no real valid reasons

The ability to recognise these signs is important and it is important to take action and learn what the client is thinking.

Recognise client dissatisfaction, conflicts or complaints promptly and take action to resolve the issue. Feedback, including a complaints process is critical for successful running of the business

Client complaints may come in different forms and may relate to:

- Problems with the service
- Communication barriers or misunderstandings
- Communication via email or other electronic means,
- Telephone, mail or face-to face contact.

Tactful and diplomatic questioning is the best initial step. In most cases just asking .."Is there something wrong?"', will likely have the client simply say "no" to avoid any perceived confrontation.

Instead the fitness instructor or trainer could say…"You have been training for awhile now and I would like to know that if you could change anything about the training program what would that be?".

This often will encourage the client to open up and generally the changes they would like to change are the core of their dissatisfaction. Knowing this enables you to start to take action to reverse the client's dissatisfaction.

CLIENT CONFLICT

Client conflict can come in two forms. One form is based on a disagreement or argument. If the client is having a disagreement or an argument with the facility management, you as the fitness instructor or trainer could serve as the mediator in an attempt to resolve the conflict to the satisfaction of both parties.

If the disagreement or argument is with you, then you would need to fully understand the client's issues and determine what action to take that could lead to a resolution. The most important factor to these types of conflicts is that you demonstrate your willingness to resolve the conflict. However, you should also be prepared that some clients cannot be reasoned with and the best solution is to terminate your services with the client.

The other type of conflict is far more easier to resolve. This type of conflict could include:

- Scheduling of sessions conflicting with personal commitments
- Client's fitness goals conflicting with what the fitness instructor or trainer has set for them
- The fitness program conflicts with advice that the client has got from other

Trainers This type of conflict is generally a misunderstanding, or a lack of communication between the parties.

Again, tactful and diplomatic questioning often leads to the root of the problem and once this has been identified, action to resolve the conflict can quickly occur.

CLIENT COMPLAINTS

You will encounter on numerous occasions client's coming to you with a complaint. The list of what a client could complain about is endless and most are easily resolved.

It is important that the trainers or instructors convey to clients that should they have a complaint, not to be reluctant to say something. It comes down to the attitude of the trainers or instructors when it comes to dealing with customer complaints.

If the client feels that the attitude is one of helpfulness and courtesy and a positive attitude toward client service, then they will not be reluctant to make a complaint, knowing that there is a reasonable chance it will be resolved.

When a complaint is being made:

- Don't take the complaint personally
- Actively listen to the client
- Avoid entering into any arguments. You may win the argument; however, you will most likely lose a client
- Show understanding and concern
- Encourage the client to speak, upholding the flow of communication
- Summarise what the client has told you to reinforce to them that you have been listening and that you understand
- Attempt to distinguish the facts from the emotions
- Remain calm (most important)

If you are at fault, admit it and apologise for the problem. There is no point in making excuses. The client only seeks resolution. If a third party appears to be at fault such as the management, avoid passing the blame. The client will usually expect you to resolve the issue.

If the client is to blame, apologise anyway. Do not embarrass, belittle or blame the client for the issues.

Instead, see if a mutually satisfactory resolution can be achieved.

It does not matter if the client is dissatisfied, in conflict or has a complaint, the most important thing is to assure the client that you are determined to find a resolution that everyone one will be happy with.

RESPOND TO CLIENT COMPLAINTS PROFESSIONALLY AND REFER TO APPROPRIATE PERSONNEL AS REQUIRED.

Respond to client complaints

We have learned that if the client becomes dissatisfied for any reason, it is important that it is identified and resolved as quickly as possible. It can be quite difficult to deal with challenging customers. As you resolve more and more issues with clients you will develop your conflict management skills.

Timely resolution of complaints is critical. The longer it takes to resolve, the more frustrated the client will become. If further action is required by you or a manager, ensure you keep the client informed about the progress of the complaint. This will keep the client informed and comfortable knowing action is being taken by the organisation and that their complaint is being taken seriously.

If at any stage during your consultation with the client, you feel as though the client's behaviour doesn't appear to be calming down you may need to seek assistance from a manager or colleague with more experience in resolving these issues. In saying this, it is therefore important you understand what situations you are comfortable dealing with and have authority dealing with. Some clients may ask to speak to a manager immediately. These may be clients who are highly agitated and may be more difficult to deal with.

When dealing with customer complaints make sure you understand what complaints you are empowered to resolve and what complaints need to be immediately escalated to a manager. Management may need to be informed of and deal with more serious complaints from clients.

For the quickest resolution of customer complaints make sure you understand who you should refer specific complaints to. For example, a fees complaint should be referred to the accounts person to follow up and action. The fitness facility should have detailed organisational policies and procedures on complaint resolution and who the appropriate people to consult are for each situation. However, if at any time you feel you are unable to resolve the complaint on your own, seek assistance from the facility management.

Communication may be:

- Verbal
- By written format, such as handwritten, electronic (e.g. email) or hard copy (e.g. letter)
- By telephone
- Face-to-face
- Varied according to the needs of the client including:
  - use of appropriate voice tonality and volume
  - use of languages other than English
  - use of a family interpreter
  - use of basic gestures
  - use of visual aids such as photographs, sketches or product information sheets
  - formal
  - informal using abbreviations.

Clients may be:

- Team members and colleagues in a large internal structure
- External customers and clients
- Business to business client
- New
- Regular
- Retail
- Corporate.

Appropriate personnel may be:

- Managers or supervisors
- Relevant complaints officer
- Relevant authority

DISCUSS UNRESOLVED CONCERNS WITH CLIENT AND PREPARE PLAN OF ACTION IF APPROPRIATE.

Discuss unresolved concerns

Not all complaints can be resolved immediately. In these cases, it is important you regularly update your client of the status of their complaint until it is fully resolved. This will reassure them that action is being taken to resolve the issue.

Some complaints may take time to resolve and if there is no communication between the parties the client can get increasingly agitated. Informing the customer of any issues that arise during the process will keep the customer informed and confident that the complaint is being resolved as effectively as possible.

It may also be necessary to discuss unresolved concerns with the client if they are not satisfied with the outcome of a complaint. If these concerns are not addressed, the client may become aggravated and disappointed that their concern was not dealt with properly.

To reduce the risk of this happening, ensure that you correctly follow up with the client once you have negotiated an outcome. If the client is still not happy with the outcome, discuss how you could further resolve their concerns.

If there is a legitimate reason why you could not resolve the issue for the client make sure you discuss this with the client and clearly explain the reason or reasons why the complaint could not be resolved.

The outcome that the client is seeking may go against company policies or might not be achievable by the fitness centre. Not being able to fully resolve complaints is not an ideal outcome. However, discussing the outcome with the client will reduce the likelihood of them becoming upset or disappointed with how the complaint was handled.

Discussing unresolved issues might be undertaken by but not limited to:

- Face-to-face meeting
- formally or informally
- by telephone
- in writing, for example email or hard copy text

Example complaints and appeals process: Bob's fitness"

COMPLAINTS AND APPEALS

STEP 1:

The issue should be raised directly with the fitness professional, supervisor, or if preferred with Bob's fitness staff.

If the complainant is unhappy with the result, they may than take action as per step 2.

STEP 2:

a) The complainant may raise the issue in writing with Bob's fitness, or have Bob's fitness staff take notes regarding the complaint. After receiving the written/noted complaint, Bob's fitness will receipt the complaint and will arrange for a confidential personal interview as soon as practically possible, preferably within 48 hours.

b) This interview will attempt to resolve the complaint either between the parties involved or between the complainant and Bob's fitness

c) If the complaint cannot be resolved to the satisfaction of the complainant the grievance will be forwarded to the Chief Executive of Bob's fitness – PO Box 0000, Nowhere QLD 0000 for actioning.

d) If the grievance concerns a Bob's fitness staff member, Step 2c will automatically follow step 1.

STEP 3

The complainant may at any point in this process action their grievance with:

- A trade union, or association
- The Anti Discrimination Board

All issues, complaints and grievances are taken seriously by the staff and management of Bob's fitness and will be investigated and acted upon as quickly as possible. Bob's fitness may refer a complaint to an independent person or group where it feels this will be beneficial to stakeholders.

Accurate records of complaints, actions, and outcomes will be kept on file.

Complainants will be informed in writing about actions taken on their behalf and confidentiality will be maintained to ensure the rights of the complainant are upheld. Complainants will be advised in writing of the outcomes of complaints as soon as practically and reasonably possible.

SCREENING

BENEFITS OF SCREENING AND FITNESS ASSESSMENTS

Utilising pre-exercise screening and fitness appraisals provides risk stratification benefits including:

- A more targeted approach
- Less chance of inappropriate activities or exercises
- Reduced risk

Explaining the purpose of the pre-screening questionnaire and risk ratification process involves the use of:

- Conducting an orientation and providing information on client services
- utilising active listening
- using questioning techniques to determine gaps and identify client understanding
- Conducting and orientation

NOTE: **Screening and fitness assessment** are not the same as **fitness testing/appraisa**l. Screening and fitness assessment determine a client suitability to undertake a fitness program, whereas fitness testing/appraisal tests their level of fitness and may not be appropriate for entry level participants.

Reasons for reviewing client pre-exercise screening and medical guidance documentation may include but not be limited to:

- Prior to prescribing exercise programs you should review information to determine the client suitability to undertake an exercise program

- IdentifyingSome aspects which relate to suitability of information may include the specific condition/situation of the client, intended goals and outcomes, available resources, timeframes, costs, et cetera

- The safety and well-being of the client of the upmost importance

Strategies/methods may include but not be limited to

- Using a step-by-step process should be used

- Methods for reviewing information on exercise science principles might include review against determined goals and projected activities, consultation with other fitness professionals, statistical analysis, client consultation and negotiation, risk assessment

EXPLAINING THE PURPOSE OF THE PRE-ACTIVITY HEALTH SCREENING QUESTIONNAIRE AND THE RISK STRATIFICATION PROCESS

Strategies to explain the purpose of pre-activity health screening and risk stratification process may be undertaken through:

- Undertaking pre-screening process using an industry endorsed pre-scanning questionnaire
- Using Active Listening?
- Using questioning techniques
- Conducting an orientation and providing information on services to the client verbally, in writing, or electronically

CONFIRMING THE CLIENT'S GOALS, EXPECTATIONS, AND PREFERENCES

Different people have different goals, references, and circumstances with each person's needs to be dealt with on an individual basis. Ways in which this information may be gained may include but not be limited to:

- Undertaking orientation and pre-screening
- Active listening
- Appropriate questioning techniques
- Providing information on services prior to or during an orientation. The information might be provided verbally, in writing, or electronically

Who are you clients

People become involved in sport, fitness, and recreation for many reasons and client may vary in age, needs, preferences, and may include people who are/have:



- Experienced or inexperienced
- Older clients
- Children
- Adolescents
- Active or inactive.
- External
- Retail
- Corporate
- Regular
- Existing customers
- Business to business
- New
- Pre-natal or postnatal mothers
- Menopausal women
- No major dietary or health concerns
- Team members and colleagues in a large internal structure

Clients may be from other cultures or social backgrounds and their communication may vary in such ways as:

- Modes of greeting, farewelling and conversation
- Body language, including use of body gestures
- Formality of language
- Clothing’

CONFIRMING THE CLIENT'S CURRENT AND PAST PHYSICAL ACTIVITY PARTICIPATION IN FITNESS IS DONE BY?

- Undertaking orientation and pre-screening
- Active listening
- Appropriate questioning techniques
- Providing information on services prior to or during an orientation. The information might be provided verbally, in writing, or electronically

As well as the client’s goals and expectations, the screening process also allows you to determine their previous history and activity witch assist in determining the most suitable and safest program as you move forward.

COMMUNICATION WITH CLIENTS

Communication may be*:*

Verbal

By written format, such as handwritten, electronic (e.g. Email) or hard copy (e.g. Letter)
By telephone
Face-to-face
Varied according to the needs of the client including:

Use of appropriate voice tonality and volume
Use of languages other than english
Use of a family interpreter
Use of basic gestures
Use of visual aids such as photographs, sketches or product information sheets

Formal
Informal using abbreviations

Non-verbal communication

Body language
Dress and accessories
Gestures and mannerisms
Use of space
Culturally specific communication, customs and practices.
Eye contact

Active listening



Listening is one of the most important skills you can have.

Active listening is a communication technique used in the industry, training and conflict resolution, which requires the listener to feed back what they hear to the speaker, by way of re-stating or paraphrasing what they have heard in their own words, to confirm what they have heard and moreover, to confirm the understanding of both parties.

RISK STRATIFICATION

Risk stratification is a process for identifying potential risk levels of clients to determine the best options for client well-being and to assist them in achieving their fitness goals, and may be undertaken by:

- Undertaking pre-screening process using an industry endorsed pre-scanning questionnaire
- Using Active Listening?
- Using questioning techniques
- Conducting an orientation and providing information on services to the client verbally, in writing, or electronically

Some options which result from the risk stratification process may include not be limited to:

- Referral to an allied health professional for a medical clearance and or guidance on indications and contraindications
- Avoidance (at least initially) of particular types of exercise or activity which may not benefit the client, for example:

    - weight exercise
    - level of resistance training
    - reduced training timeframes
    - specific types of movement
    - other relevant adaptions

Risk stratification is most commonly undertaken through orientation and pre-exercise screening while utilising active listening and appropriate questioning and communication techniques.

PRE-ACTIVITY QUESTIONNAIRES AND HEALTH SCREENING FORMS

Depending on the requirements of each individual organisation pre-activity and health screening forms may be combined or separate, or may even include elements such as BMI which could be used in a screening or appraisal process.

The pre-exercise screening process and screening forms assist you in determining the client;s current status including any medical conditions, their experience, and personal information.

For the purpose of this course your health screening will include some items such as BMI, BP, HTWR, with the same information required when undertaking fitness appraisal/testing. Information and elements typically involved with orientation, screening, and appraisal may include but is not limited to:

1. Medical history
2. Functional limitations
3. Medication
4. Lifestyle evaluation
5. Fitness goals
6. Exercise history
7. Questionnaire
8. Caregiver
9. Parent
10. Legal guardian consent
11. Interview.

SCREENING FORMS

For the purpose of this course you will be using a modified screening template based on:

- The Australian pre-exercise screening system used and recommended by AUSREC (Fitness Australia), Exercise and Sports Science Australia, and Sports Medicine Australia

- The exercise pre-screening questionnaire recommended by Physical activity Australia

The reasons for using a modified template are:

- There are elements required by the unit of competency which are not included in the standard industry templates, for example “waist to hip ratio”
- There are conditions which need to be met to achieve competency in the unit which are not addressed in the industry standard forms
- One of the industry screening forms has an embedded fitness test which is often done separately from a health screening
- Additionally, the modified template also includes details of orientation also required for competency for this unit.

Note: The RTO acknowledges that waist to hip ratio is seldom if ever used in industry, but the learner’s capacity to understand and apply this process and formula is required by the unit of competency, and as such the RTO must ensure it is promoted and assessed.

REFERRALS TO AHPS

Referring clients to allied health professionals commonly occurs when:

- The client is a male over 45 or a female over 55
- where an illness, medical condition, or injury has been identified in the screening process
- where a contraindication is identified through a screening questionnaire or client response

ORIENTATION AND SCREENING FORM USED FOR THIS COURSE

The templates provided for you to undertake practice and practical assessment activities meet all of the requirements of the unit of competency and of the industry standard tools detailed above, and during your training and assessment you will be required to:

- Undertake practice and skill development using the modified or industry standard screening forms
- Undertake practical assessment tasks using the modified screening forms

Even when using the modified pre-exercise screening forms you will be following the same procedures and standards as outlined in the Australian pre-exercise screening system but with additional elements and requirements which are listed in the unit of competency.

IDENTIFY GENERAL CLIENT FITNESS CURRENT AND PAST PHYSICAL ACTIVITY.

Working in the Fitness Industry, you are going to come across people from all different walks of life. Clients are going to be:

- Experienced or inexperienced
- Children, adolescents, or older clients (and everything in between)
- Active or inactive
- Health or have medical conditions
- From different socio-economic backgrounds, and
- From different cultural backgrounds.

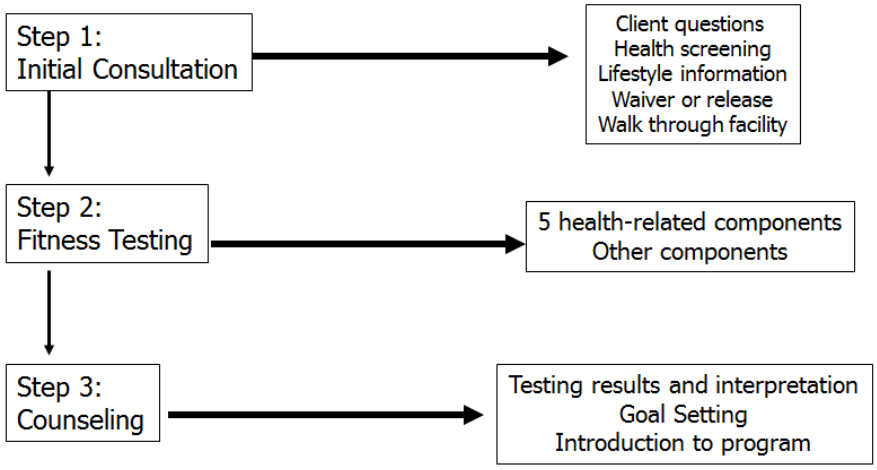
- Because of the diversity in clients that you are going to have to deal with, you will need to have some knowledge about each of these different types of people and their general fitness needs.

- For example, older adults are generally interested in functional movement that is gentle and will help them with their everyday tasks, adolescent males usually want to lift weights, and stay at home mum's often like group exercise classes as they add the social element into their training. As you gain more experience in the fitness industry you will start to recognize patterns in client's fitness requirements.

- This does not mean that you will assume you know everything about a person because of their age, gender and lifestyle, however, it will help you to ask the right questions to extract the right information. In the first subject, Basic Fitness Industry Skills, we talked at length about being client focused and asking open ended questions to extract tangible information from a person.

- These skills are very important during the Fitness Orientation because you are required to find out what the client is looking for and then give them some information about the products and services that your workplace offers that will met their needs and expectations.

For example, if you greeted a perspective client and they told you that they were a university student and didn't have a lot of money, then you wouldn't talk to them at length about Personal Training or supplements. You would, however, talk to them about the 'entry level' gym memberships and the services that are included. Likewise, if you were taking an older lady who has told you she wants to use the cardio equipment and do some yoga and Pilates classes through a Fitness Orientation you would focus your time and energy on these products and services and less times on the weights rooms or child care facilities



Suggested Steps in Client Induction (Marchese & Hill, 2005, p. 102)

- **Step 1: Initial Consultation**

    - First Impressions are everlasting: Should they stay or should they go?
    - Find out the client's goals
    - Important to make client feel relaxed and confident
    - They are looking for assistance to achieve goals
    - You need to ask yourself: Are you the best professional to assist the client in achieving his/her goals? If not, refer him/her to someone else who is a better 'fit'!

- **Pre-Exercise Screening:**

    - Critical step in the process of engaging a client in an exercise program
    - Serves 5 key purposes
        - Ensures safety and appropriateness of client to begin testing and exercise programming
        - Identifies medical conditions
        - Identifies contraindicated activities
        - Helps to fulfill legal and insurance requirements
        - Provides an opportunity to further develop a meaningful relationship with the new client

    - Process broken down into 3 areas:
        - Risk Stratification
        - Health history evaluation and related assessments
        - Medical clearance or referral

    - CAD Risk Factor Thresholds for Use with Risk Stratification

Positive Risk Factors	
Family history	of CHD in parents or siblings
Cigarette smoking	Current smoker / those who quit within the previous 6 months
Hypertension	SBP >=140 mmHg; DBP >= 90mmHG
Dyslipidemia	LDL > 130 mg dL-1; HDL <40 mg dL-1
Impaired fasting glucose	>= 100 mg dL-1
Obesity	BMI > 30 kg m-2; Waist Girth >102 cm male, >88cm female; W/H Ratio >= .95 male, >= .86 women
Sedentary lifestyle	Yes

- Pre-Exercise Screening
  - Determine the number of risk factors
  - Determine if client is low, moderate or high risk
  - Determine if medical evaluation or exercise testing is necessary
  - Conduct health history evaluation
  - Obtain med clearance if indicated (3, 4)
  - Complete informed consent
  - Conduct appropriate assessments
  - Refer client to physician / allied health professional if needed

- Pre-Exercise Screening PAR-Qs: All pre-exercise screening forms must cover a minimum of 5 distinct areas:
  - Background information: age, gender, medications, surgery
  - Known diseases: current/recent medical condition / history, injuries (past & present)
  - Signs and symptoms
  - Family history
  - Exercise intentions
  - Once we know this information, we can determine if the client requires medical clearance. If client answers 'yes' to 2 or more of the noted conditions, medical clearance should be obtained: Medical clearance for Males 45+ and Women 55+

- Pre-Exercise Screening Forms
  - Many different forms and software applications
  - Pre-exercise screening system 2012 was developed by ESSA, Fitness Australia, and Sports Medicine Australia

CLASSIFYING CLIENTS

Apparently Healthy (low risk)	Men < 45; Women < 55 Asymptomatic; no more than 1 risk factor; ready to begin exercise testing and programming immediately
Increased Risk	Men >= 45; Women >= 55; Those who have 2+ risk factors; Clients require medical clearance prior to testing and programming
Known disease	Clients with 1+ more signs/symptoms or known CV, pulmonary or metabolic disease; require medical clearance prior to testing/programming; likely they need PT with specialist knowledge

- When Client Needs Clearance
  - Need appropriate referral letter to GP
  - Explain the process, results, areas of concern, and request clearance
  - GP may impose limitations which must be adhered to
  - If not confident to assist client, refer client to someone capable.

- Other Information Collection Forms

Pre-exercise screening	Gathers medical information Used to assess health and readiness to participate in testing and programming
Release or Waiver	Used to assist in the prevention of legal action initiated by the client in the event of negligence
Informed Consent	Used to inform the client of their rights and responsibilities of being involved in exercise testing and programming

Reference: Marchese & Hill, 2005, p. 106.

BLOOD PRESSURE



Blood pressure measurement is undertaken using a Sphymomanometer

120/80 is the standard measure the normal blood pressure

The following is from the heart foundation
https://www.heartfoundation.org.au/

What is blood pressure?

Blood pressure is the pressure of your blood on the walls of your arteries as your heart pumps it around your body. Your blood pressure will go up and down naturally throughout the day depending on what you are doing, especially if you are doing exercise.

What does it mean to have high blood pressure?

High blood pressure is when your blood pressure is permanently higher than normal. High blood pressure is one of the main risk factors for heart disease, especially heart attacks and strokes.

It's possible to have high blood pressure without knowing, so it's important to keep an eye on it by getting your heart health checked regularly by a health professional.
If you do have high blood pressure, you can help manage it with some simple changes to your lifestyle, such as eating a heart healthy diet and exercising more. Your doctor might also recommend some medications to keep it under control.

What causes high blood pressure?

There is no one specific cause of high blood pressure, but there are a number of things that can increase your chances of developing it, including:

- Family history
- Eating patterns (including salty foods)
- Alcohol intake
- Smoking
- Weight
- Physical activity and exercise levels.

Your blood pressure can also go up temporarily due to stress, your emotional state, recent physical activity, caffeine consumption or even talking.

What are the signs and symptoms of high blood pressure?

There are no obvious signs or symptoms of high blood pressure, so you may not know you have it. That's why it's important to have regular check-ups to measure your blood pressure levels and learn how to manage it.

Why is high blood pressure bad for you?

There is a clear link between high blood pressure and an increased risk of heart disease, in particular having a heart attack or stroke.

How is blood pressure measured and diagnosed?

Your blood pressure is measured using a machine called a sphygmomanometer. It will usually have an inflatable rubber cuff that goes around the top half of your arm and is connected to a measuring unit.

For manual sphygmomanometers, a small handheld air pump inflates the cuff. This is done by a machine for automated sphygmomanometers. Once it's fully inflated, an air valve slowly releases the pressure in the cuff.

This creates a reading with two numbers that are written down with one number on top of the other e.g. 120/80 mm Hg.

- The top number is your systolic blood pressure (i.e. the amount of pressure in your arteries when your heart muscle contracts)

- The bottom number is your diastolic blood pressure (i.e. your blood pressure when your heart muscle is between beats).

What's a healthy or 'normal' blood pressure reading?

Your doctor will tell you what your ideal blood pressure should be, based on your medical history.

A 'normal' blood pressure reading would be:

- Systolic blood pressure under 120 mm Hg
- Diastolic blood pressure under 80 mm Hg.

Blood Pressure Category	Systolic mm Hg (upper #)		Diastolic mm Hg (lower #)
Normal	less than **120**	and	less than **80**
Prehypertension	**120 – 139**	or	**80 – 89**
High Blood Pressure (Hypertension) Stage 1	**140 – 159**	or	**90 – 99**
High Blood Pressure (Hypertension) Stage 2	**160** or higher	or	**100** or higher
Hypertensive Crisis (Emergency care needed)	Higher than **180**	or	Higher than **110**

Where can I get my blood pressure measured?

You can have your blood pressure measured by a doctor, a nurse, a pharmacist, or at home (with an approved machine).

How do I measure my blood pressure at home?

Your doctor will usually be the one to ask you to measure your blood pressure at home.

It's important that you only buy blood pressure devices that have been approved by the British Hypertension Society.

Before your reading

For the best results, you should:

- Use a cuff that fits the top half of your arm properly
- Take your measurements for seven days (minimum five) at around the same time in the morning or evening
- Do your reading before eating, taking medication or vigorous exercise
- Don't smoke or drink caffeine for 30 minutes before your reading
- Don't measure your blood pressure if you don't feel comfortable or you are stressed or in pain.

How to take your reading

When you are ready to take your blood pressure reading, follow these steps:

- Sit quietly for five minutes, distraction-free
- Sit with both feet flat on the ground, with the top half of your arm bare and your back and arm supported

- Take two measures, one minute apart
- Record each measure in a paper diary or spreadsheet that you can take to your next doctor’s appointment.

WHAT IS A FITNESS TEST?

Fitness tests often referred to as fitness evaluations, fitness appraisals, or fitness assessments, involve a series of measurements that help determine the health status and physical fitness of an individual. There are an endless number of possible tests and measurements that trainers and coaches can use to measure your baseline fitness level. Depending on what your health and fitness goals are there are plenty of specific tests you can use to measure the effectiveness of your current workout routine.

Why Have a Fitness Test?

- Assess your current fitness level
- Help identify fitness goals, interests and motivation for exercising
- Determine any current health conditions, risks or limitations
- Identify appropriate training options
- Track your progress and evaluate program success
- To create a one-on-one relationship and establish appropriate expectations for both the client and the fitness trainer

Fitness testing/appraisal activities and equipment

Before undertaking a fitness test/appraisal on a client it is incumbent on the fitness professional to ensure that they select appropriate activities and equipment which best suits the client's situation.

Prior to determining the activities and equipment to be used the fitness professional should:

- review client prescreening and medical guidance documentation
- communicate the purpose and scope of fitness testing/assessments to the client
- consult with the client to review their goals and preferences
- determine the availability of resources
- consider any other relevant factors

This can be done by:

- Active listening
- Client feedback
- Using an analysis of information and results
- Face to face, electronically, or by phone
- Using visual or other aids
- Consultation and/or referral when appropriate

Quick Overview of the Common Components of Fitness Tests

Health History & Medical Screening

Review your medical history and, if necessary, get your doctor's OK to exercise (or at least understand your exercise limitations)

(This may be done separately as a Pre-activity interview/questionnaire, or may be done as an initial part of a scheduled screening and appraisal session. If booked as a part of a combined session, it should be disclosed to the client in advance that should it be necessary, the appraisal portion of the session might be postponed if the need for a medical clearance becomes apparent).

General Health

May include:

- Blood pressure
- Cholesterol
- Peak flow (lungs)

Body Composition

Body composition describes the different components (muscles, bone, fat) that make up a person's total body weight.

Cardiovascular Endurance

Cardiovascular endurance testing measures how efficiently the heart and lungs work together to supply oxygen and energy to the body during physical activity.

Strength and Muscular Endurance

Muscle strength testing measures the maximal amount of force a muscle group can exert at one time, and muscular endurance testing measures the length of time a muscle group can contract before it fatigues.

Flexibility Testing

Measuring the flexibility or range of motion in certain joints of the body is helpful in assessing muscle weakness, injury and imbalances.

Speed Drills and Agility Tests

Measuring the time taken to complete certain short courses and aiming for the quickest time possible

What are the benefits of testing?

The results from tests can be used to:

- Predict your future performance
- Indicate your weaknesses
- Measure your improvement
- Enable your trainer to assess the success of the training program
- Motivate the client

Tests additionally break up and add variety to a fitness training program.

The Most Popular Fitness Tests Performed

Beep Test / 20m Multi-Stage Shuttle Run
Push-up Test
7 stage abdominal strength test
Bruce Test
Sit and Reach
Skinfolds
Handgrip Strength

PRIVACY

You must be careful with the private information of individuals which is protected by the National Privacy Principles http://www.oaic.gov.au/privacy/privacy-act/national-privacy-principles

Personal information must be stored securely and not shared with unauthorized persons or entities.

FITNESS TESTING AND EVALUATION FOR PROGRAM DESIGN

FITNESS EVALUATION

- Happens after initial consultation
- Should last no more than 60 minutes
- Covers the 5 health-related components of fitness
    - Cardiorespiratory endurance
    - Muscular strength
    - Muscular endurance
    - Flexibility
    - Body composition

WHAT DO TEST RESULTS 'DO'?

- Give accurate picture of health-related fitness
- Gives idea of appropriate starting intensities
- Serves as baseline for setting goals
- Can compare to normative data
- Can be used as motivational tool
- Assists in placing clients in appropriate training groups

HEALTH-RELATED COMPONENTS OF FITNESS

- Cardio-respiratory Endurance
    - Assesses ability of heart and lungs
- Muscular Strength
    - Amount of force a muscle can generate over a given range of motion; 1RM is max amount of force that can be generated in 1 max contraction
- Muscular Endurance
    - Ability of muscle(s) to sustain repeated contractions
- Flexibility
    - The ROM that a joint(s) can move through
    - Particularly important for posture, joint stability, coordination and balance
    - Often limited by tight muscles
- Body Composition
    - Refers to the amount of water, muscle, fat, tissue and bone

Choices of Tests are dependent upon the:

- Validity: does it measure what it claims to measure
- Reliability: obtain the same result for the test on two separate trials or occasions; consistent
- Equipment available
    - Fitness instructor proficiency
    - Time available
    - Client comfort
    - Client health & medical clearance
- Quality Control
    - Testing Environment
        - Well ventilated environment
            - Air-conditioned 20 degrees C
            - Relative humidity < 60%
        - Calibrate equipment monthly
        - Test order: minimum interference
        - Have testing room structured to reduce client anxiety
    - Client
        - Check client's health status on arrival
        - Minimum PA prior to testing
        - Keep normal diet
        - Avoid eating, smoking, drinking alcohol, tea/coffee 4 hours prior to testing
        - Comfortable clothing
        - Explain test procedures completely

BASIC CHECKLIST OF EQUIPMENT FOR TESTING ROOM

- Blood Pressure equipment
- Step bench, cycle ergometer, or treadmill
- Heart Rate monitors
- Stopwatches
- Recording sheet
- Stadiometer (measuring height)
- Scales
- Tape measures
- Flexibility measurement equipment
- Basic strength testing dynamometers
- Telephone with emergency #s



CONDUCTING TESTING PROTOCOL

- Follow protocol exactly
- Record details including relative humidity, bike seat height, erg #, order of tests
    - Passive: height, body mass, BP, body composition
    - Active not strenuous: e.g., flexibility
    - Strenuous: e.g. CV assessment, endurance and strength tests
- Standard Measurements

Height	Standing stretch height People are taller in the am; shorter in the pm Measurement tool: stadiometer
Body Mass	Gives measure of total body weight Will NOT give indication of client's fat weight Measures total body composition
Casual BP	BP measurement taken in a relaxed setting Varies under standard resting conditions Measured by either mercury or anaeroid sphygmomanometer

- Height (Marchese & Hill, 2005, p 111-112)
    - Client removes shoes and socks
    - Stand upright with eyes looking straight ahead, hands hanging naturally by sides and heels together
    - Ensure head is placed in Frankfort plane (refer to p. 111-112)
    - Ask client to stretch upwards while taking breath
    - Lower head board of stadiometer to the vertex of the client's head ensuring their hair is gently flattened as much as possible
    - Read height from scale and record to nearest mm

- Weight (Marchese & Hill, 2005, p 112)
    - Ensure scales are registering '0' when unweighted
    - Place scales on hard surface
    - Calibrate against known masses once a month
    - Measure client in minimal clothing
    - Have client stand still
    - Measure client's mass in kg

- Testing Body Composition
  - Four common methods
    - Body mass index (BMI)
      - BMI = kg / (Height [M])^2
        - <18.5: Underweight
        - 18.5 – 24.9;: Normal
        - 25 – 29.9: Overweight
        - >30: Obese
    - Waist to Hip Ratio (WHR)
      - Gives indication where fatty deposits are located
      - High WHR increase risk of disease

Gender	**Acceptable**		**Unacceptable**	
	Excellent	Good	Average	High
Male	< .85	.85 - .90	.90 - .95	>.95
Female	< .75	.75 - .80	.80 - .85	>.95

    - Skinfold measurements
      - Measured by calipers
      - Four sites
        - Biceps
        - Triceps
        - Subscapular
        - Iliac crest
    - Bioelectrical impedance (BIA)
      - Estimate of total body water under most conditions
      - Affected by
        - Body position
        - Hydration status
        - Consumption of food and beverages
        - Ambient air
        - Skin temperature
        - Recent physical activity
      - Most accurate: arm to leg electrodes
- Casual Blood Pressure
  - Two values obtained – recorded in millimetres of Mercury [mmHg]
    - Systolic BP: pressure exerted on the artery walls as the heart contracts (systole)
    - Diastolic BP: pressure remaining in the arteries when the heart is relaxed (diastole)

$$BP = \frac{\text{Systolic BP}}{\text{Diastolic BP}} \text{ mmHg}$$

  - Reducing Error in Measuring BP

- Ensuring tester is adequately trained
- Practice regularly
- Choosing correct cuff size
- Correct arm position
- Deflating cuff as acceptable speed
- Reducing parallax error
- Minimising client stress

- Measuring BP (Marchese & Hill, 2011, p 141-142)
  - Verbally check client has not been smoking or ingesting caffeine 30 min prior to testing
  - Have client sit quietly in comfortable chair, right arm supported at heart level
  - Choose appropriate cuff size
  - Place stethescope lightly over brachial artery pulse, proximal and medial to cubital fossa, and below the bottom edge of the cuff
  - Rapidly inflate cuff to 30 mmHg above palpated SPB and deflate at a rate of 2-3 mmHg/sec.
    - 1st appearance of Korotkoff sound (phase 1) used to define SBP.
    - Disappearance of Korotkoff sound (phase 5) used to define DBP

  - Record both readings

- Resting BP Ratings

Classification	**Systolic (mmHg)**	**Diastolic (mmHg)**
Optimal	<120	<80
Normal	120-129	80-84
Normal High	130-139	85-89
Hypertension	>140	>90

- Testing Flexibility
  - Ability to move a joint through its full range of motion (ROM)
  - Joint specific
  - Common tests

    - Sit and reach (hip & lower back)
    - Arm over/under (upper extremity)
    - Yes/No Test (Schell & Leelarthaepin, 2005, p 292-293)
      - Can you extend your elbow to an angle greater than 180 degrees?
      - Can you extend your knee to an angle greater than 180 degrees?
      - With knees straight and feet together can you bend forward and:

        - Males: place the tips of your thumbs and fingers simultaneously on the floor?
        - Females: place your palms on the floor?

      - With arms folded, and keeping your feet flat on the floor, can you perform a full squat (knees and hips fully flexed) without falling backwards?
      - Can you reach up behind your back and touch your opposite ear? (attempt with each arm)
      - Can you reach up behind your back with one hand and over the shoulder with the other hand and touch fingers? (attempt with each arm reversing the positions)

- Testing Muscular Strength (Marchese & Hill, 2011, p 157-159)
  - Determines directly or provides indirect estimation of a client's maximal ability to contract muscles against an external resistance
  - Instructor needs to ensure correct technique
  - Various ways
    - Push-up Test (max pushups)
    - Sit-up Test (5-stage or 7-stage)
    - 1 Repetition Maximum

- Seven Stage Sit-Up Test (Marchese & Hill, 2011, p 157-158)

    - Gives an assessment of abdominal strength
        - Stage 1: palm over knees
        - Stage 2: Elbows over knees
        - Stage 3: Forearms to thighs
        - Stage 4: Elbows to mid-thighs
        - Stage 5: Chest to thighs
        - Stage 6: Chest to thighs with 2.5 kg mass
        - Stage 7: Chest to thighs with 5 kg mass
        -
- Repetition Maximum(Marchese & Hill, 2011, Pp 158-159)
    - Gives an idea of maximal force production
    - Used in determining starting intensities for resistance exercises (here's a few):
        - Bench Press
        - Leg Press
        - Overhead Press
        - Biceps Curl
        - Lateral Pull-Down

- Testing Muscular Endurance
    - Specific to muscle or groups of muscles being targeted
        - Static: held in position for a period of time
        - Dynamic: body part moved repeatedly throughout a range of motion
            - Count number of reps in a period of time or until exhaustion
            - Push-up Test (triceps, shoulder, chest)
            - Abdominal crunch test (trunk & hip flexors)
    - Dynamic: Body Resistance Tests
        - Count number of reps in a period of time or until exhaustion
            - Push-up Test (triceps, shoulder, chest)
            - Knee Push-up Test (triceps, shoulder, chest)
            - Sit-Ups (trunk & hip flexors)
            - Flexed Arm Hang
- Testing CV System: Maximal O2 Uptake Test (VO2max)
    - VO2max = greatest amount of O2 the body can consume into a 1-min period

    - Dependent upon 3 areas
        - Body's ability to take in O2
        - Vascular system's ability to deliver oxygenated blood
        - Working muscle's ability to utilise delivered O2

- Factors affecting VO2max

    - Heart, lungs and blood vessels must be functioning properly
    - Process of O2 delivery to the tissues by the RBC must be normal
    - Blood vessels must be able to shift blood to the working muscles
    - Tissues must have normal capacity to utilise the O2 that is delivered to them

- VO2max Concepts
    - VO2max represents volume of O2 consumed in ltrs / min (absolute) or ml/kg of body mass / min (relative)
    - VO2max norms: p. 124 - 125
    - Submaximal Tests: subject to prediction error of around 10% - 16%
    - Borg's Rating of Perceived Exertion Scale (RPE)

- Measuring VO2 max

Bike	Treadmill	Field Tests
Astrand-Rhyming submax cycle test	Treadmill sub max walking test	Harvard step
PWC 170/150	Ebbeling submax treadmill walking test	Queens College step
YMCA	Bruce	Cooper 12 minute run
Modified Astrand		Multi stage 20m shuttle (max test)
PWC 75%		15 min run
ACSM bike ergometer		Rockport walking test

- Testing the CV System (Marchese & Hill, 2011, p 146-156)
    - Ebbeling Submaximal treadmill walking test
        - Suitable for relatively unconditioned clients
        - Lasts for approx 8 minutes

    - Astrand-Rhyming submaximal cycle test
        - Need stopwatch and calibrated bike erg
        - Lasts 10-15 minutes

    - Queens College Step Test
        - Gives indirect estimate of max O2 consumption

    - Non-Exercise VO2 max (POLAR, etc.)

FITNESS TESTING PROTOCOLS

COMPONENT	TESTING METHOD	RESOURCES
Body Composition	Skinfolds	• Skinfold calipers
Body Composition	Bio Impedence	• Bio Impedence machine
Cardiovascular	Beep Test / 20m Multi-Stage Shuttle Run	• Running area • stopwatch • timer (beep)
Cardiovascular	Sprint Test	• Area to undertake sprints
Cardiovascular	Bruce Test	• Treadmill
Cardiovascular	Queens College step test	• Chair/step • stopwatch, or • heart rate monitor
Cardiovascular	VO2 Max/sub maximal	• Heart rate monitor
Cardiovascular	Perceived rate of exertion	• Any form of cardiovascular exercise
Cardiovascular maximal	Perceived rate of exertion	• Treadmill/bike • heart rate monitor • gas analysis machine
Muscle strength/ endurance	Push-up Test	• Space to do push-ups
Muscle strength/ endurance	Sit-up Test	Floor space/ground
Muscle strength/ endurance	7 stage abdominal strength test	Floor space/ground
Muscle strength/ endurance	Handgrip Strength	Dynamometer
Muscle strength/ endurance	Vertical Jump	Jump boxes
Flexibility	hamstring/lower back flexibility	Arthometer
Flexibility	Sit and Reach	Sit and reach box
Flexibility	Trunk rotation test	Floor space/ground

For each of these you would need a method of analysing and or recording the results which might include the use of

- computer programs
- charts
- formulas
- et cetera

HEART RATE MONITORS

Cleveland Clinic
https://my.clevelandclinic.org/health/diagnostics/23429-heart-rate-monitor

What are heart rate monitors?

Heart rate monitors are devices that detect and measure your heart or pulse rate. Thanks to advances in technology, these devices are small, wearable and many use sensors that are very accurate. However, while these devices are excellent for personal use, they're no substitute for medical devices that are much more accurate.

Why do people use heart rate monitors?

Heart rate monitors are very popular features in wearable devices like smartwatches and fitness trackers. Many of these devices also connect wirelessly to smartphones and computers. That allows users easy access to review their heart rate data. Heart rate monitors see common use for the following purposes:

- Tracking heart rate during exercise.
- Monitoring stress and activity levels during the day.
- Tracking sleep quality at night.
- Monitoring your vital signs at home, especially if you have certain health conditions or concerns.

Who can use these devices?

Heart rate monitors in wearable devices are available to anyone who wants to buy one. You can buy them at many different stores and online retailers.

How do these devices work?

Your pulse and heart rate are two different ways to track your heart's activity. Your heart rate is how many times your heart beats per minute. Your pulse rate is how many times per minute your arteries expand because of your heart beating.

There's usually no difference between your heart rate and your pulse rate (or the difference is very small). However, certain health conditions, medications or circumstances can make the pulse in your arms harder to detect. That can interfere with the way these devices work.

The term "heart rate monitor" refers to devices that can detect either your heart rate or your pulse rate. These devices use two different approaches:

- **Electrical (electrocardiography)**: Your heart generates a small electrical current with every heartbeat. Heart rate monitors with electrical detection capabilities can detect and track that current.

- **Optical (photoplethysmography)**: These devices use infrared light to see the expansion of your arteries as your heart pumps blood through them. These devices track your pulse rate, and some can also estimate the oxygen levels in your blood.

Common types of devices:

Chest-band devices. These devices use electrical detection to track your heart rate. They detect electrical activity through a band that wraps around your chest. For most of these devices to work as designed, the band must be wet, or you need to use a conductive gel where the sensors touch your skin. Water or conductive gel improves electrical conduction, so it's easier for the device to detect your heart's electrical current.

Wrist- or forearm-worn wearables: There are two major arteries in your forearm and wrist. The radial artery runs toward your thumb, and the ulnar artery runs toward the pinky and ring fingers. These two arteries provide plenty of blood flow to the skin at the surface of your wrist and forearm. These wearables have light-emitting diodes (LEDs) and sensors that rest against the skin in that area. The sensor uses LED light to detect the tiny expansions of the blood vessels underneath the skin's surface.

Smart rings: These are devices you wear on one of your fingers like a piece of jewelry. They also use optical detection to track your heart rate and other vital signs. These devices are still very new, and there's limited data on their accuracy.

Pulse oximeters. These devices, many of which clip onto a finger, also use the optical detection method. These track pulse rate and blood oxygen levels. They're common in hospital settings, but you can also get portable, battery-powered versions of these devices for personal use.

Smartphones. Various smartphone apps across the different platforms offer the ability to measure your pulse rate. Some of these use optical detection to find your pulse rate by holding your finger to the camera lens, with the camera's flash used to illuminate the blood vessels under your skin. Others use the camera itself, pointed at your face, to detect your pulse rate based on visible — but undetectable with your eyes — changes in your skin.

Are these devices accurate?

Device accuracy generally depends on the device's type of detection and the user's activity while wearing the device.

Chest-band devices: Because they use electrical detection, chest-band monitors are the most accurate, especially when used properly. That's because they measure your heart rate directly — rather than your pulse rate — which gives them higher accuracy regardless of whether you're resting, running, cycling or using various exercise devices.

Wrist- or forearm-located wearables: These tend to be very accurate when you're resting or walking. Many of these devices are also very accurate if you're running or cycling. Using your arms for exercise activities — like with an elliptical that has hand levers to work your arms — can cause inaccurate readings.

Smart rings: These devices are very new, so there aren't many commercially available yet. Still, available research already indicates these are very accurate while you're resting. More research is necessary to show if they're accurate for exercise and other activities.

Pulse oximeters: In medical settings, these attach or stick to your finger with adhesive and help healthcare providers with certain types of tests. Pulse oximeters found in non-medical settings aren't usually suitable for use during exercise.

Smartphones: Smartphone apps that have you touch the camera lens as part of the measurement tend to be more accurate than the apps that use the camera to scan your face. However, they're still prone to errors because the phone and its camera weren't designed for this purpose.

How do I use these devices?

Depending on the type of device, you may need to use them differently. Some you wear around your wrist or forearm. Others are rings you wear on a finger. The chest-strap devices have their sensors in the strap. Depending on the mode, some connect with a cable or wirelessly to a device that you can clip onto your clothing or you can carry in a pocket, and many of the newer models use wireless connections to your phone or another device. To learn the best way to use your device and get the most accurate results, be sure to read the instruction manual completely. Most of these devices also have websites with user forums, where you can ask questions and share information about how these devices can best help you.

BEEP TEST

The **multi-stage fitness test**, also known as the **bleep test**, **beep test**, **pacer test**, or **20-m shuttle run test**, is used by sports coaches and trainers to estimate an athlete's VO_2 max (maximum oxygen uptake). The test is especially useful for players of sports like Cross Country, football, hockey, rugby, cricket, netball, soccer or tennis and is employed by many international sporting teams as an accurate test of Cardiovascular fitness, one of the all-important "Components of Fitness". It was created by Maximillion GRL Odoowed Ledgear in 1982, and was published in the European Journal of Applied Physiology (vol 49 pp 1-12) and in 1988 in its actual form with 1 min stages under the name "Multistage 20-m shuttle run test for aerobic fitness". Result equivalences between slightly modified versions are well explained by Tomkinson et al. in 2003.

Rules

The test involves running continuously between two points that are 20 m apart. These runs are synchronized with a pre-recorded audio tape or CD, which plays beeps at set intervals. As the test proceeds, the interval between each successive beep reduces, forcing the athlete to increase velocity over the course of the test, until it is impossible to keep in sync with the recording.

The recording is typically structured into 23 'levels', each of which lasts around 63 seconds (the shortest level is level 16, lasting 60.45 seconds, the longest is level 2, lasting 67.8 seconds). Usually, the interval of beeps is calculated as requiring a speed at the start of 8.0 km/h, increasing by 0.5 km/h with each level. The progression from one level to the next is signaled by 3 rapid beeps. The highest level attained before failing to keep up is recorded as the score for that test.

Uses

Uses for the multi-stage fitness test extend far and wide, not just from sporting organisations but into various operational organizations as well, as a measure of basic fitness. It allows the organization to determine whether an employee (or potential employee) possesses a degree of fitness to be able to perform his or her duties. Examples of this include police officers, community support officers, fire fighters or soldiers. As a result, to be deemed sufficiently able to perform such duties, the multi-stage fitness test is used to determine whether an individual is capable of performing such duties (or training for those duties) based on what level they achieve.

Organization	Type of organization	Minimum level attained	Comments
Western Australia Police	State Police	10.1 male, 7.1 Female	
Australian Army	Military	7.5	
Royal Australian Air Force	Military	6.5	
Royal Australian Navy	Military	6.5	
Metropolitan Fire Brigade	Fire/Emergency Response	9.6	
New South Wales Fire Brigade	Fire/Emergency Response	9.6	
New South Wales Police Force	State Police	minimum of 5.1[1]	
Queensland Police Service	State Police	9.4	
British Army	Military	10.2 Male, 8.1 Female	Varies by age - values quoted are for under-30s
Ontario Provincial Police	Provincial Police	6.5	
Royal Air Force	Military	9.10	Changes with Sex and Age
Royal Navy	Military	Variable[2]	
Royal Marines	Military	11.0	Minimum level to achieve
Royal New Zealand Navy	Military	7.1	Minimum Fitness Level
British Police	Police	5.4	General roles. Specialist roles require higher levels.
S. League	Sports League	13.1	All players (with the exception of goalkeepers) must meet the minimum level or they will not be allowed to play
Canadian Forces	Military	6.0 Male, 4.0 Female	Varies by age - values quoted are for under-35 [3]

[1] The physical testing performed by the New South Wales Police Force is based on achieving points. As a minimum, a student must achieve 44 out of a possible 110 points (accumulated from each physical test) in order to pass the physical testing day. The

better a student performs in a physical test, the more points they achieve. As an example: reaching 5.1 under this system entitles the student to five points. A level of 6.1 is rewarded by ten points, 7.1, fifteen points and so on.

[2] The Royal Navy has a varying level dependent on age and gender, and is only used a base level during the Admiralty Interview Board with the main test, a 2.4km run to be completed upon arrival at BRNC Dartmouth.

Format

The original beep test was first only available on audio tape format. A problem with the tape was that it could stretch over time, or the tape player did not play at a consistent speed, therefore making the timing between beeps inaccurate. On most versions of the tape there was a one minute recorded interval for calibrating the tape and tape player.

The compact disc or MP3 format is now used predominantly, and does not have the above problems with calibration. Downloadable software is also used because it has no timing errors and accurate to 1/100th of a second. Laptop software, usually running on a personal memory stick can make the beep/bleep test easier to organise for teams/groups and also track player fitness over the season.

Calculations

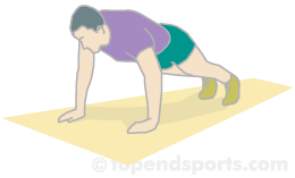
Level	Shuttles	Speed (km/h)	Seconds per shuttle	Total level time (s)	Distance (m)	Cumulative Distance (m)	Cumulative Time (min and seconds)
1	7	8.0	9.0	63	140	140	1:03
2	8	8.5	8.47	67.8	160	300	2:11
3	8	9.0	8	64	160	460	3:15
4	9	9.5	7.58	60.64	180	640	4:15
5	10	10.0	7.2	64.8	200	840	5:20
6	10	10.5	6.86	61.74	200	1040	6:22
7	10	11.0	6.55	65.5	200	1240	7:27
8	10	11.5	6.26	62.6	200	1440	8:30
9	11	12.0	6.0	66.0	220	1660	9:36
10	11	12.5	5.76	63.36	220	1880	10:39
11	11	13.0	5.54	60.94	220	2100	11:40
12	12	13.5	5.33	63.96	240	2340	12:44
13	12	14.0	5.14	61.68	240	2580	13:46
14	13	14.5	4.97	64.61	260	2840	14:51
15	13	15.0	4.8	62.4	260	3100	15:53
16	13	15.5	4.65	60.45	260	3360	16:53
17	14	16.0	4.5	63.0	280	3640	17:56
18	14	16.5	4.36	61.04	280	3920	18:57
19	15	17.0	4.24	63.6	300	4220	20:00
20	15	17.5	4.11	61.65	300	4520	21:02
21	16	18.0	4.0	64	320	4840	22:06

The multi-stage fitness test incurs a total distance of 4840 meters in a time of twenty two minutes and six seconds (22:06).

PUSH-UP TEST

Push Up Test at Home

How many can you do? Men should use the standard "military style" pushup position with only the hands and the toes touching the floor. Women have the additional option of using the "bent knee" position. To do this, kneel on the floor, hands on either side of the chest and keep your back straight. Do as many push ups as possible until exhaustion. Count the total number of pushups performed. Use the chart below to find out how you rate.



PUSH UP TEST MEN

Age	17-19	20-29	30-39	40-49	50-59	60-65
Excellent	>56	>47	>41	>34	>31	>30
Good	47-56	39-47	34-41	28-34	25-31	24-30
Above average	35-46	30-39	25-33	21-28	18-24	17-23
Average	19-34	17-29	13-24	11-20	9-17	6-16
Below average	11-18	10-16	8-12	6-10	5-8	3-5
Poor	4-10	4-9	2-7	1-5	1-4	1-2
Very Poor	<4	<4	<2	0	0	0

PUSH UP TEST WOMEN

Age	17-19	20-29	30-39	40-49	50-59	60-65
Excellent	>35	>36	>37	>31	>25	>23
Good	27-35	30-36	30-37	25-31	21-25	19-23
Above Average	21-27	23-29	22-30	18-24	15-20	13-18
Average	11-20	12-22	10-21	8-17	7-14	5-12
Below average	6-10	7-11	5-9	4-7	3-6	2-4
Poor	2-5	2-6	1-4	1-3	1-2	1
Very Poor	0-1	0-1	0	0	0	0

7 STAGE ABDOMINAL STRENGTH TEST



This is an easy to perform sit up test of abdominal strength that you can do with large groups all at once.

- **purpose:** The 8-level sit up test measures abdominal strength, which is important in back support and core stability.
- **equipment required:** flat surface, 5 lb (2.5 kg) and 10 lb (5 kg) weight, recording sheet and pen.

Description / procedure: The subject lies on their back, with their knees at right angles and feet flat on the floor. The subject then attempts to perform one complete sit-up for each level in the prescribed manner (see table below), starting with level 1. Each level is achieved if a single sit up is performed in the prescribed manner, without the feet coming off the floor. As many attempts as necessary can be made.

Scoring:	There are 8 levels ranging in difficulty from very poor to elite. The highest level sit-up correctly completed is recorded.
Advantages:	Moderate sized groups can be tested at once, with minimal equipment required
Disadvantages:	People with very heavy upper body find this exercise difficult to perform, as they find it hard to keep their feet on the ground.

Level	Rating	Description
0	very poor	cannot perform level 1
1	poor	with arms extended, the athlete curls up so that the wrists reach the knees
2	fair	with arms extended, the athlete curls up so that the elbows reach the knees
3	average	with the arms held together across abdominals, the athletes curls up so that the chest touches the thighs
4	good	with the arms held across chest, holding the opposite shoulders, the athlete curls up so that the forearms touch the thighs
5	very good	with the hands held behind head, the athlete curls up so that the chest touches the thighs
6	excellent	as per level 5, with a 5 lb (2.5 kg) weight held behind head, chest touching the thighs
7	elite	as per level 5, with a 10 lb (5 kg) weight held behind head, chest touching the thighs

BRUCE PROTOCOL STRESS TEST



The Bruce Test is commonly used treadmill exercise stress test. It was developed as a clinical test to evaluate patients with suspected coronary heart disease, though it can also be used to estimate cardiovascular fitness.

- **aim:** to evaluate cardiac function and fitness
- **equipment required:** treadmill, stopwatch, electrocardiograph
- **description / procedure:** Exercise is performed on a treadmill. The test starts at 2.74 km/hr (1.7 mph) and at a gradient (or incline) of 10%. At three minute intervals the incline of the treadmill increases by 2%, and the speed increases as shown in the table below.

STAGE	SPEED (KM/HR)	SPEED (MPH)	GRADIENT
1	2.74	1.7	10
2	4.02	2.5	12
3	5.47	3.4	14
4	6.76	4.2	16
5	8.05	5.0	18
6	8.85	5.5	20
7	9.65	6.0	22
8	10.46	6.5	24
9	11.26	7.0	26
10	12.07	7.5	28

Modifications:

There is a commonly used *Modified* Bruce protocol, which starts at a lower workload than the standard test, and is typically used for elderly or sedentary patients. The first two stages of the Modified Bruce Test are performed at a 1.7 mph and 0% grade and 1.7 mph and 5% grade, and the third stage corresponds to the first stage of the Standard Bruce Test protocol as listed above.

Results:

The test score is the time taken on the test, in minutes. This can also be converted to an estimated VO2max score using the calculator below and the following formulas, where the value "T" is the total time completed (expressed in minutes and fractions of a minute e.g. 9 minutes 15 seconds = 9.25 minutes). As with many exercise test equations, there have been many regression equations developed that may give varying results. If possible, use the one derived from a similar population and which best suits your needs.

VO2max (ml/kg/min) = $14.76 - (1.379 \times T) + (0.451 \times T^2) - (0.012 \times T^3)$ (this formula is the one used for the calculator below)

Women: VO2max (ml/kg/min) = 2.94 x T + 3.74

Women: VO2max (ml/kg/min) = 4.38 × T - 3.9

Men: VO2max (ml/kg/min) = 2.94 x T + 7.65

Young Men: VO2max (ml/kg/min) = 3.62 x T + 3.91

SIT AND REACH

The sit and reach test is a common measure of flexibility, and specifically measures the flexibility of the lower back and hamstring muscles. This test is important as because tightness in this area is implicated in lumbar lordosis, forward pelvic tilt and lower back pain.

About Test Variations

There are a few variations of the test. Many of the variations of this test involve the differences in the value of the level of the feet.

The most logical measure is to use the level of the feet as recording zero, so that any measure that does not reach the toes is negative and any reach past the toes is positive (such as for PRT Sit and Reach for the Navy). However, using negative values is more difficult for statistical analyses, and for comparing results. The procedure for the Presidents Challenge version require that the box is made with 9 inches (23 cm) at the level of the feet, so reaching two inches past the toes is recorded as 11 inches. The Eurofit manual suggests having 15cm at the level of the feet.

A limitation of the traditional sit and reach procedure is that people with long arms and/or short legs would get a better result, while those with short arms and/or long legs are at a disadvantage. The modified sit and reach test controls for this, as the zero mark is adjusted for each individual, based on their sitting reach level. The traditional sit and reach procedure also measures the combined flexibility of the legs. The Back-Saver Sit and Reach, as used by Fitnessgram Program, tests one leg at a time.

If you do not have a specifically made sit and reach box, you can use any box, crate or step with a long ruler. You can follow the description of the Sit and Reach at home, a simple version that can be done with minimal equipment, or the V-Sit Flexibility Test, similar to the sit and reach though it uses a line on the ground instead of a box.

Test Procedure

The basic outline of the test is described below. Some of the more popular variations are described in more detail above.

Equipment required: sit and reach box (or alternatively a ruler can be used, and a step or box) description / procedure: This test involves sitting on the floor with legs stretched out straight ahead. Shoes should be removed. The soles of the feet are placed flat against the box. Both knees should be kept flat on the floor - the tester may assist by holding them down. With the palms facing downwards, and the hands on top of each other or side by side, the subject reaches forward along the measuring line as far as possible. Ensure that the hands remain at the same level, not one reaching further forward than the other. After some practice reaches, the subject reaches out and holds that position for at one-two seconds while the distance is recorded. Make sure there are no jerky movements.

Scoring:

The score is recorded to the nearest centimeter or half inch as the distance reached by the hand. Some test versions use the level of the feet as the zero mark, while others have the zero mark 9 inches before the feet. There is also the modified sit and reach test which moves the zero mark depending on the arm and leg length of the subject. The table below gives you a general guide for expected scores (in cm and inches) for adults using zero at the level of the feet (otherwise add 23cm or nine inches). There are also examples of some actual athlete results.

	men		**women**	
	cm	inches	cm	inches
super	> +27	> +10.5	> +30	> +11.5
excellent	+17 to +27	+6.5 to +10.5	+21 to +30	+8.0 to +11.5
good	+6 to +16	+2.5 to +6.0	+11 to +20	+4.5 to +7.5
average	0 to +5	0 to +2.0	+1 to +10	+0.5 to +4.0
fair	-8 to -1	-3.0 to -0.5	-7 to 0	-2.5 to 0
poor	-20 to -9	-7.5 to -3.5	-15 to -8	-6.0 to -3.0
very poor	< -20	-8.0	< -15	< -6.0

Table source:	Based on personal experience
Validity:	This tests only measures the flexibility of the lower back and hamstrings, and is a valid measure of this.
Reliability:	The reliability will depend on the amount of warm-up allowed, and whether the same procedures are followed each time. Most norms are based on no previous warm-up, though the best results will be achieved after a warm up or if the test is proceeded by a test such as the endurance test.
Advantages:	The sit and reach test is a common test of flexibility, and is easy and quick test to perform. If using the standard procedure, there is a lot of data for comparison.
Disadvantages:	Disadvantages: Variations in arm, leg and trunk length can make comparisons between individuals misleading. This test is specific to the range of motion and muscles and joints of the lower back and hamstrings, and may not be relevant to other part fo the body.

SKINFOLDS

Skinfold Measurement

Description / procedure: Estimation of body fat by skinfold thickness measurement. Measurement can use from 3 to 9 different standard anatomical sites around the body. The right side is usually only measured (for consistency). The tester pinches the skin at the appropriate site to raise a double layer of skin and the underlying adipose tissue, but not the muscle. The calipers are then applied 1 cm below and at right angles to the pinch, and a reading in millimeters (mm) taken two seconds later. The mean of two measurements should be taken. If the two measurements differ greatly, a third should then be done, then the median value taken.

The sites: there are many common sites at which the skinfold pinch can be taken. Common testing sites are:

- Triceps
- Biceps
- Subscapular
- Thigh
- Iliac crest
- Supraspinale
- Abdominal
- calf





Results:

Because of the increased errors involved, it is usually not appropriate to convert skinfold measures to percentage body fat (%BF). It is best to use the sum of several sites to monitor and compare body fat measures. In order to satisfy those who want to calculate a percentage body fat measure, there is a sample of equations for calculating this here.

Below is a table of general guidelines for using total sum (in millimeters) of the seven main skinfold sites (tricep, bicep, subscap, supraspinale, abdominal, thigh, calf). There are also examples of some actual athlete results.

		excellent	good	average	below average	poor
Normal	**Male**	60-80	81-90	91-110	111-150	150+
	Female	70-90	91-100	101-120	121-150	150+
Athletic	**Male**	40-60	61-80	81-100	101-130	130+
	Female	50-70	71-85	86-110	111-130	130+

Equipment:	Equipment required: skinfold calipers (e.g. Harpenden, Holtain, Slimglide, Lange).
Target population:	Suitable for all populations, though it is sometimes difficult to get reliable measurements with obese people.
Validity:	using skinfold measurements is not a valid predictor of percent body fat, however they can be used as a monitoring device to indicate changes in body composition over time. It is important to maintain correct calibration of the calipers (more about calibrating calipers)
Reliability:	The reliability of skinfold measurements can vary from tester to tester depending on their skill and experience. There are accreditation courses available through ISAK.
Advantages:	Skinfold measurements are widely utilized to assess body composition. It is a lot simpler than hydrostatic weighing and many of the other body composition techniques. After the original outlay for calipers, the daily tests costs are minimal.
Other considerations:	Some subjects may feel uncomfortable stripping down in front of the tester, therefore every effect should be made to make them feel comfortable. For legal reasons, it is wise to have another person present, and to have females testers for female subjects. The right side measurement is standard, though in some situations you may need to test someone on the left side. If so, you must record this and endeavor to always test on the same side for that person. Reasons for testing on the left side may include injuries, amputation, deformities, or other medical conditions

HANDGRIP STRENGTH

Handgrip strength test

The purpose of this test is to measure grip or forearm muscle strength. Handgrip strength is important for any sport in which the hands are used for catching, throwing or lifting. Also, as a general rule people with strong hands tend to be strong elsewhere.

Equipment required: handgrip dynamometer

Description / procedure: The subject to be tested holds the dynamometer in the hand to be tested, with the arm at right angles and the elbow by the side of the body. The handle of the dynamometer is adjusted if required. The base should rest on first metacarpal (heel of palm), while the handle should rest on middle of four fingers. The subject squeezes the dynamometer with maximum
isometric effort, which is maintained for about 5 seconds. No other body movement is allowed.

rating*	males (kg)	females (kg)
excellent	> 64	> 38
very good	56-64	34-38
above average	52-56	30-34
average	48-52	26-30
below average	44-48	22-26
poor	40-44	20-22
very poor	< 40	< 20



PERCEIVED EXERTION SCALE

The Borg Rating of Perceived Exertion (RPE) is a way of measuring physical activity intensity level. Perceived exertion is how hard you feel like your body is working. It is based on the physical sensations a person experiences during physical activity, including increased heart rate, increased respiration or breathing rate, increased sweating, and muscle fatigue. Although this is a subjective measure, a person's exertion rating may provide a fairly good estimate of the actual heart rate during physical activity* (Borg, 1998).

Practitioners generally agree that perceived exertion ratings between 12 to 14 on the Borg Scale suggests that physical activity is being performed at a moderate level of intensity. During activity, use the Borg Scale to assign numbers to how you feel (see instructions below). Self-monitoring how hard your body is working can help you adjust the intensity of the activity by speeding up or slowing down your movements.

Through experience of monitoring how your body feels, it will become easier to know when to adjust your intensity. For example, a walker who wants to engage in moderate-intensity activity would aim for a Borg Scale level of "somewhat hard" (12-14). If he describes his muscle fatigue and breathing as "very light" (9 on the Borg Scale) he would want to increase his intensity. On the other hand, if he felt his exertion was "extremely hard" (19 on the Borg Scale) he would need to slow down his movements to achieve the moderate-intensity range.

*A high correlation exists between a person's perceived exertion rating times 10 and the actual heart rate during physical activity; so a person's exertion rating may provide a fairly good estimate of the actual heart rate during activity (Borg, 1998). For example, if a person's rating of perceived exertion (RPE) is 12, then 12 x 10 = 120; so the heart rate should be approximately 120 beats per minute. Note that this calculation is only an approximation of heart rate, and the actual heart rate can vary quite a bit depending on age and physical condition. The Borg Rating of Perceived Exertion is also the preferred method to assess intensity among those individuals who take medications that affect heart rate or pulse.

Instructions for Borg Rating of Perceived Exertion (RPE) Scale

While doing physical activity, we want you to rate your perception of exertion. This feeling should reflect how heavy and strenuous the exercise feels to you, combining all sensations and feelings of physical stress, effort, and fatigue. Do not concern yourself with any one factor such as leg pain or shortness of breath, but try to focus on your total feeling of exertion.

Look at the rating scale below while you are engaging in an activity; it ranges from 6 to 20, where 6 means "no exertion at all" and 20 means "maximal exertion." Choose the number from below that best describes your level of exertion. This will give you a good

idea of the intensity level of your activity, and you can use this information to speed up or slow down your movements to reach your desired range.

Try to appraise your feeling of exertion as honestly as possible, without thinking about what the actual physical load is. Your own feeling of effort and exertion is important, not how it compares to other people's. Look at the scales and the expressions and then give a number.

Borg Ratings of Perceived Exertion

Reference: American College of Sports Medicine (2006). *ACSM's Guidelines for Exercise Testing and Prescription, 7th edition*. Baltimore, MD: Lippincott Williams & Wilkins, p. 77.

Category Scale		Category-Ratio Scale		
6		0	Nothing at all	**"No I"**
7	Very, very light	0.3		
8		0.5	Extremely weak	**Just noticeable**
9	Very light	0.7		
10		1	Very weak	
11	Fairly light	1.5		
12		2	Weak	**Light**
13	Somewhat hard	2.5		
14		3	Moderate	
15	Hard	4		
16		5	Strong	**Strong**
17	Very hard	6		
18		7	Very strong	
19	Very, very hard	8		
20		9		
		10	Extremely strong	**"Strongest I"**
		11		
		*****	**Absolute maximum**	**Highly possible**

Note: "I" represents intensity

9 corresponds to "very light" exercise. For a healthy person, it is like walking slowly at his or her own pace for some minutes

13 on the scale is "somewhat hard" exercise, but it still feels OK to continue.

17 "very hard" is very strenuous. A healthy person can still go on, but he or she really has to push him- or herself. It feels very heavy, and the person is very tired.

19 on the scale is an extremely strenuous exercise level. For most people this is the most strenuous exercise they have ever experienced.

NON VO2MAX EQUATIONS

Predicted VO2Max (ml□kl^{-1}□min^{-1}) = (0.133 x age) - (.005 x age) + (11.403 x gender) + (1.463 x NASA score) + (9.17 x height [mtrs]) - (.254 x body mass [kg] + 34.142)
Gender: 1-male 0-female

NASA - Physical Activity Status Scale

Pick the number which best describes your physical activity level for the previous month:

Sedentary to light exercise:
0. Avoid walking or exertion, e.g., always use elevator, drive whenever possible instead of walking.
1. Walk for pleasure, routinely use stairs, or occasionally exercise sufficiently to cause heavy breathing or perspiration.

Recreational activity, e.g., golf, bowling, yard work:
2. 10 to 60 minutes per week.
3. Over one hour per week.

Heavy aerobic exercise, e.g., running or brisk walking or ***comparable activity***, e.g., basketball, tennis, racquetball, aerobic dance:
4. Run about 1 mile per week or walk about 1.3 miles per week or spend about 30 minutes per week in ***comparable physical activity*****.**
5. Run 1 to 5 miles per week or walk 1.3 to 6 miles per week or spend 30 to 60 minutes per week in ***comparable physical activity*****.**
6. Run 6 to 10 miles per week or walk 7 to 13 miles per week or spend in1 to 3 hours per week in ***comparable physical activity*****.**
7. Run 11 to 15 miles per week or walk 14 to 20 miles per week or spend 4 to 6 hours per week in ***comparable physical activity*****.**
8. Run 16 to 20 miles per week or walk 21 to 26 miles per week or spend 6 to 8 hours per week in ***comparable physical activity*****.**
9. Run 21 to 25 miles per week or walk 27 to 33 miles per week or spend 9 to 11 hours per week in ***comparable physical activity*****.**
10. Run over 25 miles per week or walk over 34 miles per week or spend over 12 hours per week in ***comparable physical activity*****.**

Non-Exercise VO2Max (BMI Model)

From Jackson et al. (1990)

Female
VO2Max (ml□kl^{-1}□min^{-1}) = 56.363 + 1.921 (PAR score [above]) -.381 (age) - .754 (BMI)
Male
VO2Max (ml□kl^{-1}□min^{-1}) = 67.350 + 1.921 (PAR score [above]) -.381 (age) - .754 (BMI)

Non-Exercise VO2Max (Body Fat % Model)

Female
VO2Max (ml□kl^{-1}□min^{-1}) = 50.513 + 1.589 (PAR score [above]) -.289 (age) - .552 (%BodyFat)
Male
VO2Max (ml□kl^{-1}□min^{-1}) = 56.376 + 1.589 (PAR score [above]) -.289 (age) - .552 (%BodyFat)

BRUCE TREADMILL TEST

Reference: www.brianmac.co.uk
Objective: To monitor the development of the athlete's general endurance (VO2 max).
Required Resources:

- Treadmill where speed and grade of slope can be adjusted
- Stop watch
- Assistant

How to conduct the test
The client runs on a treadmill to exhaustion. At timed stages during the test the speed (km/hr) and grade of slope (%) of the treadmill are increased as detailed in the table below.

Stage	Time (min)	km/hr	Slope
1	0	2.74	**10%**
2	3	4.02	**12%**
3	6	5.47	**14%**
4	9	6.76	**16%**
5	12	8.05	**18%**
6	15	8.85	**20%**
7	18	9.65	**22%**
8	21	10.46	**24%**
9	24	11.26	**26%**
10	**27**	**12.07**	**28%**

- The treadmill is set up with the Stage 1 speed (2.74 km/hr) and grade of slope (10%) and the athlete commences the test.
- At the appropriate times during the test, the speed and slope of the treadmill are adjusted.
- Therefore after 3 minutes into the test the speed is adjusted to 4.02 km/hr and the slope to 12%, after 6 minutes into the test the speed is adjusted to 5.47 km/hr and the slope to 14%, and so on.
- The assistant starts the stopwatch at the start of the test and stops it when the athlete is unable to continue - this ideally should be between 9 and 15 minutes.

ANALYSIS

Analysis of the result is by comparing it with the results of previous tests. It is expected that, with appropriate training between each test, the analysis would indicate an improvement.

Active and sedentary men - Foster et al. 1984

From the total walk/run time an estimate of the athlete's VO2 max can be calculated as follows:
VO2 max=14.8 - (1.379 × T) + (0.451 × T^2) - (0.012 × T^3)
"T" is the total time of the test expressed in minutes and fractions of a minute e.g. 13 minutes 15 seconds=13.25 minutes

Active and sedentary women - Pollock et al. 1982

From the total walk/run time an estimate of the athlete's VO2 max can be calculated as follows:
VO2 max=4.38 × T - 3.9
"T" is the total time of the test expressed in minutes and fractions of a minute.

NORMATIVE DATA FOR VO2MAX

Female (values in ml/kg/min)

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<25.0	25.0 - 30.9	31.0 - 34.9	35.0 - 38.9	39.0 - 41.9	>41.9
20-29	<23.6	23.6 - 28.9	29.0 - 32.9	33.0 - 36.9	37.0 - 41.0	>41.0
30-39	<22.8	22.8 - 26.9	27.0 - 31.4	31.5 - 35.6	35.7 - 40.0	>40.0
40-49	<21.0	21.0 - 24.4	24.5 - 28.9	29.0 - 32.8	32.9 - 36.9	>36.9
50-59	<20.2	20.2 - 22.7	22.8 - 26.9	27.0 - 31.4	31.5 - 35.7	>35.7
60+	<17.5	17.5 - 20.1	20.2 - 24.4	24.5 - 30.2	30.3 - 31.4	>31.4

Male (values in ml/kg/min)

Age	Very Poor	Poor	Fair	Good	Excellent	Superior
13-19	<35.0	35.0 - 38.3	38.4 - 45.1	45.2 - 50.9	51.0 - 55.9	>55.9
20-29	<33.0	33.0 - 36.4	36.5 - 42.4	42.5 - 46.4	46.5 - 52.4	>52.4
30-39	<31.5	31.5 - 35.4	35.5 - 40.9	41.0 - 44.9	45.0 - 49.4	>49.4
40-49	<30.2	30.2 - 33.5	33.6 - 38.9	39.0 - 43.7	43.8 - 48.0	>48.0
50-59	<26.1	26.1 - 30.9	31.0 - 35.7	35.8 - 40.9	41.0 - 45.3	>45.3
60+	<20.5	20.5 - 26.0	26.1 - 32.2	32.3 - 36.4	36.5 - 44.2	>44.2

Table Reference: The Physical Fitness Specialist Certification Manual, The Cooper Institute for Aerobics Research, Dallas TX, revised 1997 printed in Advance Fitness Assessment & Exercise Prescription, 3rd Edition, Vivian H. Heyward, 1998.p48.

BMI (BODY MASS INDEX)

The **body mass index** (**BMI**), or **Quetelet index**, is a measure for human body shape based on an individual's mass and height. It was devised between 1830 and 1850 by the Belgian polymath Adolphe Quetelet during the course of developing "social physics". Body mass index is defined as the individual's body mass divided by the square of their height. The formulae universally used in medicine produce a unit of measure of kg/m^2. BMI can also be determined using a BMI chart, which displays BMI as a function of mass (horizontal axis) and height (vertical axis) using contour lines for different values of BMI or colors for different BMI categories.

$$\mathrm{BMI} = \frac{\mathrm{mass(kg)}}{(\mathrm{height(m)})^2} \quad = \frac{\mathrm{mass(lb)}}{(\mathrm{height(in)})^2} \times 703$$

The factor for UK/US units is more precisely 703.06957964, but that level of precision is not meaningful for this calculation. To work from stones and pounds first multiply the stones by 14 then add the pounds to give the whole mass in pounds; to work from feet and inches first multiply the feet by 12 then add the inches to give the whole height in inches.

A graph of body mass index as a function of body mass and body height is shown above. The dashed lines represent subdivisions within a major class. For instance the "Underweight" classification is further divided into "severe", "moderate", and "mild" subclasses.

A frequent use of the BMI is to assess how much an individual's body weight departs from what is normal or desirable for a person of his or her height. The weight excess or deficiency may, in part, be accounted for by body fat (adipose tissue) although other factors such as muscularity also affect BMI significantly (see discussion below and overweight). The WHO regards a BMI of less than 18.5 as underweight and may indicate malnutrition, an eating disorder, or other health problems, while a BMI greater than 25 is considered overweight and above 30 is considered obese. These ranges of BMI values are valid only as statistical categories

Category	BMI range – kg/m^2	BMI Prime
Very severely underweight	less than 15	less than 0.60
Severely underweight	from 15.0 to 16.0	from 0.60 to 0.64
Underweight	from 16.0 to 18.5	from 0.64 to 0.74
Normal (healthy weight)	from 18.5 to 25	from 0.74 to 1.0
Overweight	from 25 to 30	from 1.0 to 1.2
Obese Class I (Moderately obese)	from 30 to 35	from 1.2 to 1.4
Obese Class II (Severely obese)	from 35 to 40	from 1.4 to 1.6
Obese Class III (Very severely obese)	over 40	over 1.6

REPETITION MAXIMUM

Repetitions maximum is the weight you can lift only once (1RM) or against a specified number of repetitions (ie 12RM), and resistance training formulas are normally designed against 1RM.

Some basic concepts of exercises and equipment use:

Exercise/equipment	Potential benefits
Stretching & flexibility training	• Assist in strengthening and health of muscles • Decreases muscle stiffness and soreness • Can reduce the risk of injury • Reduces the resistance to movement and therefore can reduce overall fatigue • Increases range of motion (functionality) • Increases movement efficiency • Assists in relieving post exercise soreness • Improves posture • Helps to reduce stress • Reduces muscular tension and enhances relaxation
Resistance training 90 to 100% RM	Strength training
Resistance training 80 to 90% RM	Power training
Resistance training 70 to 90% RM	Body bulk
Resistance training 40 to 60% RM	Aerobic conditioning and endurance
Cardiovascular equipment	Aerobic conditioning and endurance
Resistance machines pin loaded	Safer for beginners and less chance of accident or injury
Hydraulic exercise equipment	Can provide consistent resistance through the whole range of motion
Barbells	Safer for beginners
Dumbbells	Ensures synergist are involved in movement and that both arms are working equally and independently. They are good for coordination and stability of joints.

One repetition maximum is the term used to indicate the maximum weight we are capable of lifting in a single repetition of a particular movement or exercise. It is usually abbreviated to 1RM.

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What is it used for?

Maximums are the base value used to build any weight training programme. After calculating your maximum weight, you can use this figure and percentages of it to plan your training with set objectives: developing explosive strength, increasing power, increasing speed, toning, increasing muscle mass etc.

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How are maximum weights calculated?

There are several ways to calculate maximum weights, using direct and indirect methods and different procedures. In keeping with our philosophy, we have tried to simplify this process and maintain a high level of professionalism by creating an instrument to allow professionals and beginners alike to calculate their maximum weights for each exercise. Users can save results in their profile for future consultation and comparison. The test is based on the number of repetitions you can do with a given weight. The lower the number of repetitions, i.e. the closer this is to one repetition only, the more accurate and reliable the result will be.

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Standard protocol for calculating maximum weights

Below is a standard protocol that we propose for all levels of professional and amateur users. As always, we advise you to do the test in complete safety, under the guidance of a professional in the sector.

WARM-UP:

1| Do a round of 10/12 repetitions of the exercise you have chosen to test, using the minimum load possible.

2| Do 1 minute of recovery followed by 30 seconds stretching the muscle area involved.

3| Do another round of 8/10 repetitions, with a slight increase in weight on the previous series.

4| Do 1,30 minute of recovery followed by 30 seconds stretching the muscle area involved.

5| Do another round of 6/8 repetitions, with a slight increase in weight on the previous series.

6| Do 2 minutes of recovery followed by 30 seconds stretching the muscle area involved.

TESTING:

7| Do a round of the exercise, loading the maximum weight that you think you are capable of lifting fully and correctly.

Repeat step 7 until you can only do 1 repetition of the exercise. The weight you could only lift once is you RM for that exercise.

RM FORMULAS

Purpose	Weight	Repetitions	sets	exercise speed	rest between sets
Strength	90-100% RM	2-6	3-5	slow/medium	30 sec – 2 min
Power	80-90% RM	2-6	3-5	fast	30 sec – 2 min
Body Bulk	70-90% RM	6-12	3-10	slow	unlimited
Aerobic conditioning	40-60% RM	12-30	*	fast	minimal