



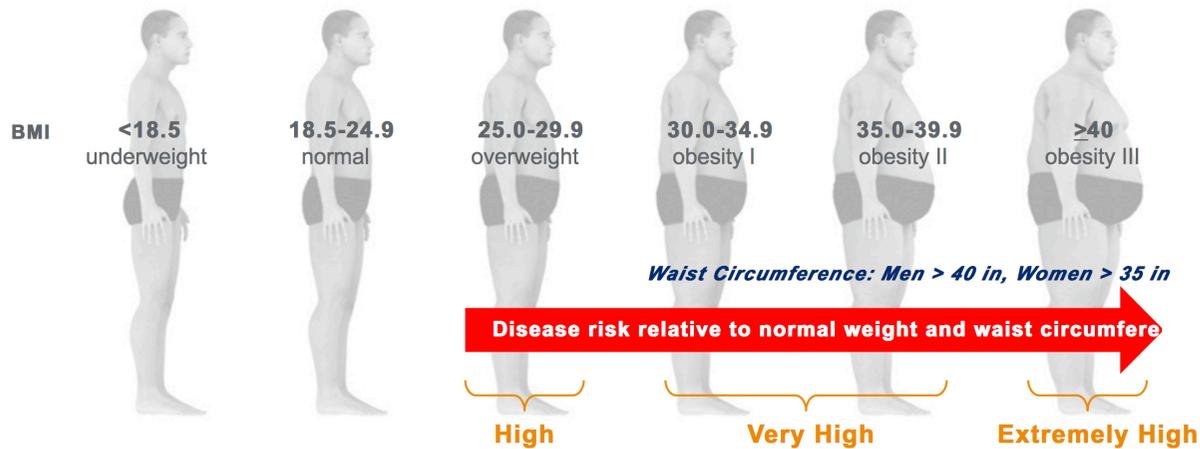
Physical Activity in patients with severe obesity

***Andrea Ermolao
Sport and Exercise Medicine Division
University of Padova***

Summary

- Introduction
- Clinical evaluation
- Functional evaluation
- Physical activity level and readiness
- Exercise prescription
 - Presence of comorbidities/limiting conditions
 - Functional capacity
 - General guidelines and FITT principle
 - PA planning: goals, exercise counselling
- Start exercise with supervision
- Follow-up

Introduction



- Very high prevalence of comorbidities

BMI, kg/m ² *	WC, cm*		Co-morbidities
	men < 94, women < 80	men ≥ 94, women ≥ 80	
25.0-29.9	L	L	L ± D
30.0-34.9	L	L ± D	L ± D ± S**
35.0-39.9	L + D	L + D	L + D + S
≥40.0	L ± D ± S	L ± D ± S	L ± D ± S

L = Lifestyle intervention (diet and physical activity); D = consider drugs; S = consider surgery.

*BMI and waist circumference cut-off points are different for some ethnic groups.

**Patients with type 2 diabetes on individual basis.

CLINICAL EVALUATION:

○ Patient's clinical evaluation:

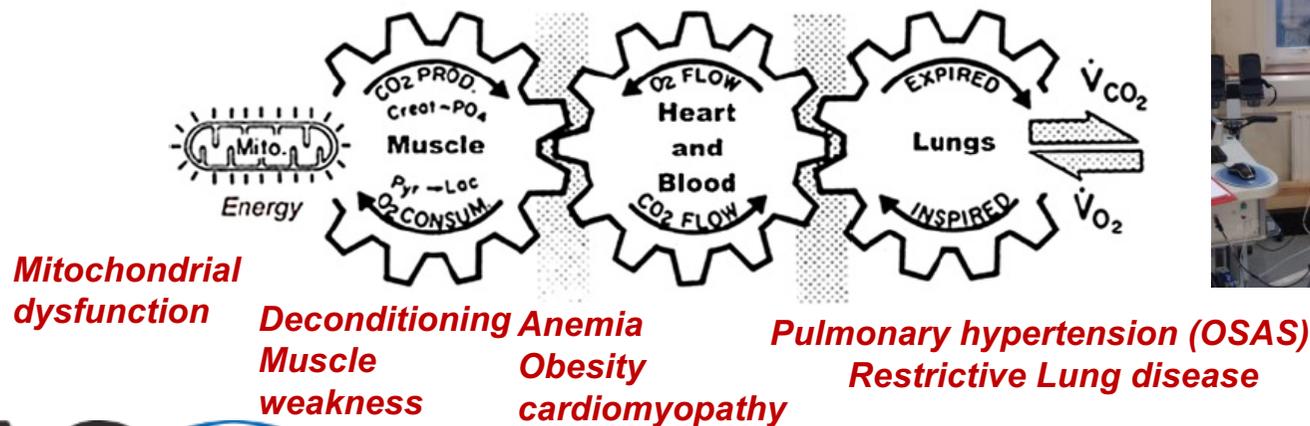
- Pathological conditions, risk factors and symptoms
- Other clinical conditions relevant for physical activity prescription
- Pharmacological therapy (drugs interfering with cardiovascular responses, thermoregulation, hydration status, ...)
- Level of physical activity and reported capacity
- Level of motivation and barriers to practice

FUNCTIONAL EVALUATION

- Exercise capacity (cardiovascular or cardiopulmonary exercise test)
- Strength tests (Lab or field tests)
- Balance evaluation (Lab or field tests)
- Flexibility

FUNCTIONAL EVALUATION: CARDIOPULMONARY EXERCISE TEST

- Includes:
 - ECG, Blood Pressure, SpO₂
 - Pulmonary ventilation
 - Oxygen consumption (V_{O₂}) and carbon dioxide production (V_{CO₂}) during an exercise test.



STRENGTH EVALUATION (LAB OR FIELD TESTS)



- Isometric, isokinetic,
- Concentric test (4-RM, 8-RM)
- 30-second chair stand, 30-sec arm curl
- ...

FLEXIBILITY – RANGE OF MOTION

- **Sit-and-reach test** for the lower back and hamstring muscles.
- **Lateral trunk flexibility test.**
- **Back scratch test** to evaluate shoulder range of motion.
- **ROM measure of specific joint,** depending on the clinical evaluation and/or patients' report/complain.



BALANCE EVALUATION

- **Stabilometry** (Romberg test with open and closed eyes)
- **Field test** (TUG test, M-CTSIB, Berg Balance Scale, ...)



PHYSICAL ACTIVITY LEVEL

○ **Physical activity level:**

- General questions
- Structured PA Questionnaires (IPAQ, GPAQ, ...)
- Pedometers, accelerometers, ...
- ...

PHYSICAL ACTIVITY LEVEL

Exercise Vital Sign Questions

- On average, how many days per week do you engage in at least moderate to vigorous physical activity like a brisk walk?

(Response range: 0-7 days)

- On those days, for how many minutes do you engage in physical activity at this level?

(Response range: 10, 20, 30, 40, 60, >60 min)

PHYSICAL ACTIVITY READINESS

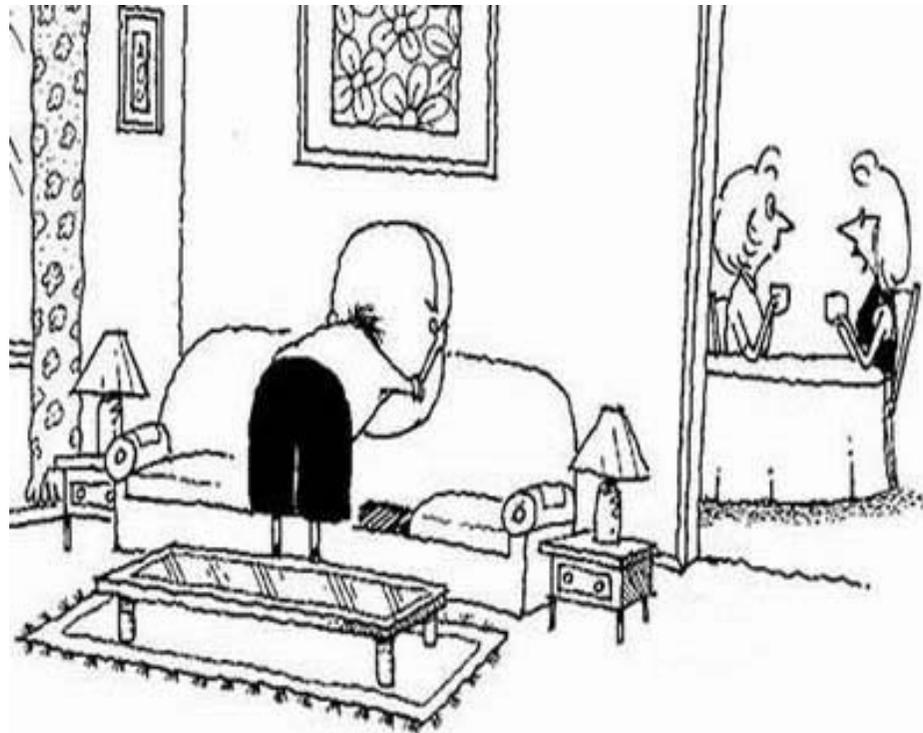
Stages of change theory categorizes the change process into five basic categories:

1. Precontemplation—not yet aware of the need to change
2. Contemplation—aware of the need to change and actively pondering it
3. Preparation—getting emotionally ready and gathering mechanisms to support change
4. Action—actively involved in trying to change behaviors
5. Maintenance—having established a new behavior, working to maintain it long-term

Stages of change theory can be extremely helpful at providing a rough notion of the patient's mindset, thus giving the counselor clues on how to facilitate progress. Consider three common chief complaints of people who have been referred to cardiac rehabilitation:

1. "Well, I just got out of the hospital. My doctor said I had a heart attack, and he made me come see you, but I don't really know what for. He told me to eat more vegetables, but I hate them."
2. "Well, I just got out of the hospital. My doctor said I had a heart attack, and he told me to go to cardiac rehabilitation. He said you can help me avoid having another heart attack."
3. "Well, I just got out of the hospital because I had a heart attack. I haven't had a cigarette since then, I bought a book about the Mediterranean diet, and I've been walking 30 minutes a day."

EXERCISE PRESCRIPTION



The doctor said he needed more activity. So
I hide his T.V. remote three times a week.

INDIVIDUAL EXERCISE PRESCRIPTION



NAME

AGE

Anthropometric data: Height – Weight – BMI

Main clinical data

Drug therapy

EXERCISE PRESCRIPTION

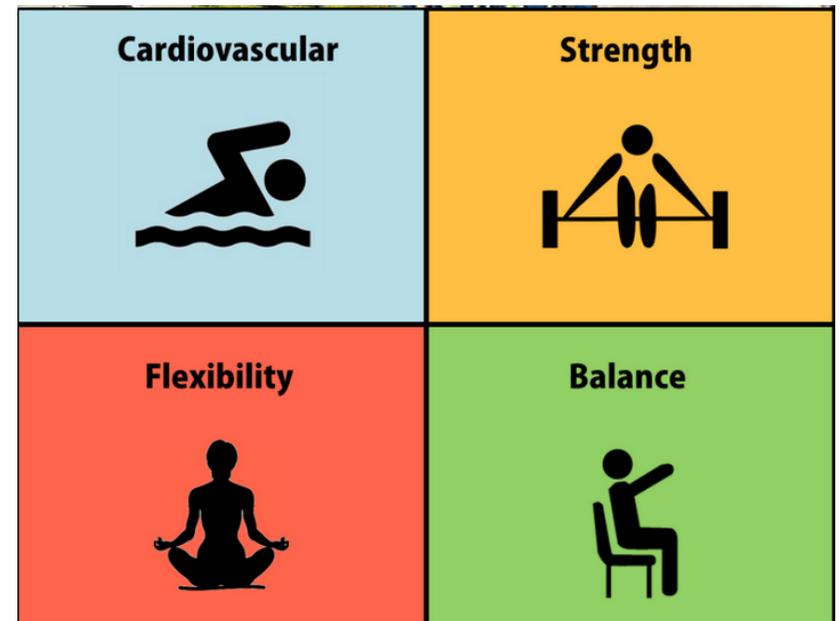
Aerobic exercise

Strength training

Flexibility

Balance training

Special attentions



EXERCISE PRESCRIPTION: FITT Principle

- **F** = frequency of exercise
- **I** = intensity of exercise
 - Objective: VO_2 , heart rate, speed, watts, % 1-RM
 - Subjective: Rating of Perceived Exertion (Borg 6-20 scale)
- **T** = time or duration or number of sets and repetitions
- **T** = type or mode of exercise [e.g., walk, bike, concentric and eccentric muscle actions involved in multijoint (e.g., chest shoulders, hips) and single-joint (e.g., abdominal muscles, hamstring group, biceps) exercises]
- **PROGRESSION**

EXERCISE PRESCRIPTION - General guidelines and FITT principle

Training method	Mode	Intensity	Frequency	Duration	Progression	Goals	Special considerations and comments
Aerobic	<ul style="list-style-type: none"> Walking Consider any non-weight-bearing mode where appropriate 	<ul style="list-style-type: none"> Initially at moderate intensity of 40% to 59% of heart rate reserve Increase to 60% to 80% 	Progress to daily	Progress to 60 to 90 min	<ul style="list-style-type: none"> Initial bouts are typically 10 to 20 min if person has no recent exercise history Advance duration and frequency initially and intensity later Consider beginning at lower end of intensity for very deconditioned people 	<ul style="list-style-type: none"> Achieve regular exercise pattern Achieve 60 to 90 min per day by the time weight maintenance program begins 2,000 to 2,800 kcal per wk expended 	<ul style="list-style-type: none"> Non-weight-bearing modes should be considered if joint pain or injury exists Watch for indications of hyperthermia Provide guidelines on water consumption during exercise

EXERCISE PRESCRIPTION - General guidelines and FITT principle

Training method	Mode	Intensity	Frequency	Duration	Progression	Goals	Special considerations and comments
Resistance	<ul style="list-style-type: none"> • Machines • Free weights • Elastic bands • Calisthenics 	<ul style="list-style-type: none"> • 10- to 15RM (i.e., 10-15 repetitions per set) • RPE of 11-15 (6-20 scale) 	2 or 3 d per week	30 min involving two sets per major muscle group with minimum 1 min rest between sets	As tolerated to maintain 10 to 15 reps per set at a RPE of 11 to 15	<ul style="list-style-type: none"> • Regular resistance training • Improved skeletal muscle strength and endurance • Maintenance of lean mass during rapid weight loss phase 	<ul style="list-style-type: none"> • Because of range of motion limitations, some equipment may be difficult to use (e.g., machines) • Because of high incidence of hypertension, consider reducing breath hold or Valsalva maneuver
Range of motion	Static and proprioceptive or passive stretching	Within comfortable ranges	Daily	10 to 30 s per major joint	Increased range of motion as tolerated	Enhanced range of motion	Keep in mind that certain stretching techniques may be difficult for some obese or overweight patients (e.g., because of poor balance, coordination, inability to sit on floor)

EXERCISE PRESCRIPTION

○ Prepare a structured prescription



REGIONE DEL VENETO
AZIENDA OSPEDALIERA - UNIVERSITÀ DI PADOVA
Dipartimento di Medicina - DIMED
Unità Complessa Medicina dello Sport e dell'Esercizio
Dott. W. Flor, Marco Zaccaro
Via Giustiniani, 2 - 35128 Padova
Tel. 0498215850, Fax. 0498215310, e-mail:med.spa@unipadova.it



Fig. XX
Età: 66aa. Dati antropometrici: Statura 1,240 cm - Peso 260 Kg - BMI: 26,41 Kg/m²

Dati di ricerca clinici: Precisa diagnosi e tipo di care e presenza (1, 2, 16) per IRC in diabete mellitus di tipo 1. Esordito nell'anno precedente il diabete Mellitus di tipo 1. Diagnosi di diabete mellitus di tipo 1. Ampiezza delle dita del piede destro per gesso, diabete. Riferisce ridotta tolleranza all'esercizio fisico. Precisa diagnosi di diabete mellitus di tipo 1. Parametri di rischio elevato del diabete mellitus di tipo 1. Terapia attuale: Adagran 45mg, Myfonic 300mg x 2, Metformin 4 mg, Mycosum 4 compresse, Sildenafil 50 mg, Sildenafil 300 mg x 2, Tadalafil 1 g, Cardiazepina 100 mg, Proviron 20 mg, Candesartano 30 mg, Metformin 200 mg, Lasix 25 mg, Dexamet 300mg x 2, Risperidone, Amoxicilina.

INDICAZIONI DI ESERCIZIO IN BASE ALLA VALUTAZIONE FUNZIONALE ESEGUITA
Paziente di decessione, presenta un discreto tolleranza allo sforzo e capacità funzionale moderata e limitata rispetto ai parametri di riferimento per genere ed età. I principali problemi clinici sono legati alla ridotta massa muscolare, allo stato di decessione cardiocircolatoria e alla ridotta tolleranza al piede destro dovuta alla amputazione delle dita. Considerare la presenza di una malattia periferica e di diabete mellitus di tipo 1.
Si consiglia di iniziare la pratica di esercizio fisico partendo da attività di tipo aerobico di intensità moderata, associata ad esercizi di mobilizzazione di collo e di articolazioni, ad esercizi di equilibrio e di rafforzamento muscolare, con particolare attenzione agli arti inferiori ed alla muscolatura del "core" (limitando per quanto possibile gli esercizi che comportino carichi verticali della pressione e/o addosso alla schiena).

Attività aerobica: attività di ciclismo su stadi, idealmente con frequenza di 3-5 volte/ settimana e durata complessiva di circa 30-50 minuti, in base alle tolleranze del paziente. Incrementare la durata in modo progressivo, per arrivare a complessive almeno 150-200 minuti settimanali, anche ad ogni 3-4 mesi. Nel caso dell'esercizio, monitorare e preferibilmente utilizzare moderate (RPE comprese tra 11-13/20), intensità di esercizio percepita pari a "leggero o un po' pesante". In termini di frequenza cardiaca, si consiglia di usare un'attività inferiore ai 125 bpm, utilizzando nelle fasi iniziali della seduta (riscaldamento) frequenze inferiori ai 85 bpm. Nella progressione, puntare all'aumento di durata e frequenza, mantenendo invariata l'intensità. Eseguire sempre una fase di defaticamento con progressiva riduzione dell'intensità dello sforzo prima della sua conclusione.

Trasferimento della forza: Con carichi di lavoro da definire in funzione dell'esercizio specifico e del suo uso (utilizzo di un carico potrebbe corrispondere a quello tollerabile almeno 20 volte prima di raggiungere l'esaurimento o quando una specifica tecnica). Eseguire 8-10 ripetizioni di esercizio, che coinvolgano i grandi gruppi muscolari, con particolare attenzione al potenziamento dei muscoli flessori della gamba e degli estensori della caviglia. Ogni esercizio può essere ripetuto in serie, partendo inizialmente da 1 serie, e progressivamente 1-2 nel caso di 4-6 settimane, eseguendo un numero complessivo di 10-15 ripetizioni per serie. L'intensità dello sforzo complessivo dovrebbe corrispondere a circa 13-15/20 secondo la Scala di Borg ("un po' pesante - pesante").

M.E. In considerazione dell'attuale presenza di ipertensione arteriale, il programma di esercizio dovrà incrementare con molta gradualità, in base alla tolleranza complessiva del paziente.

Stabilità ed equilibrio: esercizio di stretching statico generalizzato secondo le indicazioni e le priorità mediche. Esercizio di equilibrio progressivo, con un carico graduale della complessità degli esercizi. Non esistono attuali controindicazioni alla pratica dell'attività fisica sopra proposta. Restano a disposizione per ulteriori informazioni o necessità.

Padova, 5 ottobre 2016

Medico Specialista

Specialista in Medicina dello Sport

EXERCISE PRESCRIPTION - PA planning, exercise counselling

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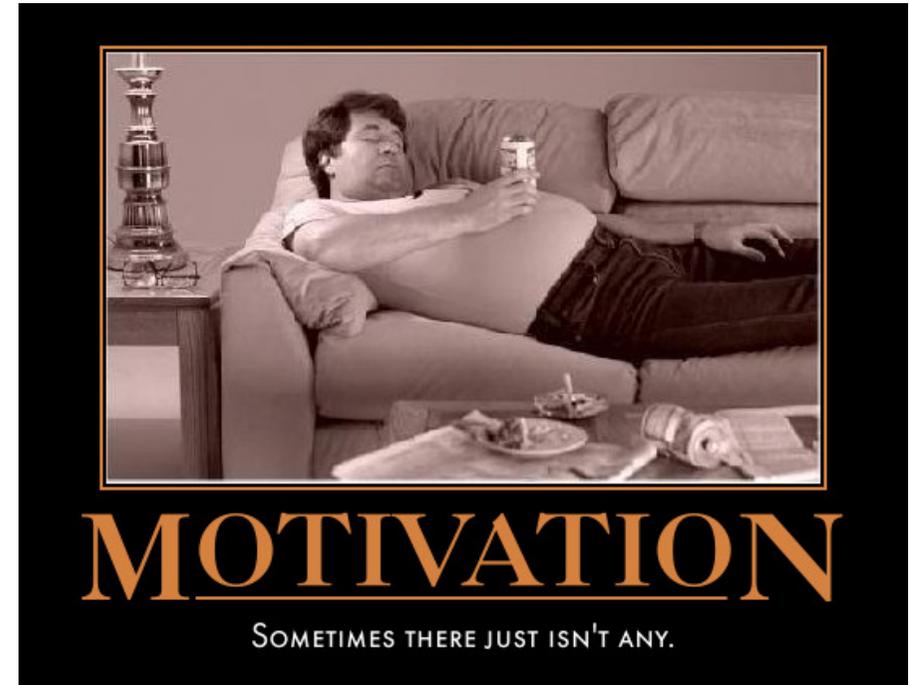


"Refusing to go to the gym is not the same thing as resistance training."

EXERCISE PRESCRIPTION - PA planning, exercise counselling

THE FIVE A'S

- **Assess:** the patient's readiness for change, social support; self-efficacy;
- **Advise:** Provide a structured, individually tailored counselling message;
- **Agree:** Initiate shared decision making based on the patient's stage of change;
- **Assist:** Provide the patient with a written prescription, printed support materials, self-monitoring tools.
- **Arrange:** Schedule a follow-up visit. Provide telephone or e-mail reminders and Internet-based counselling. Refer the patient for additional assistance.



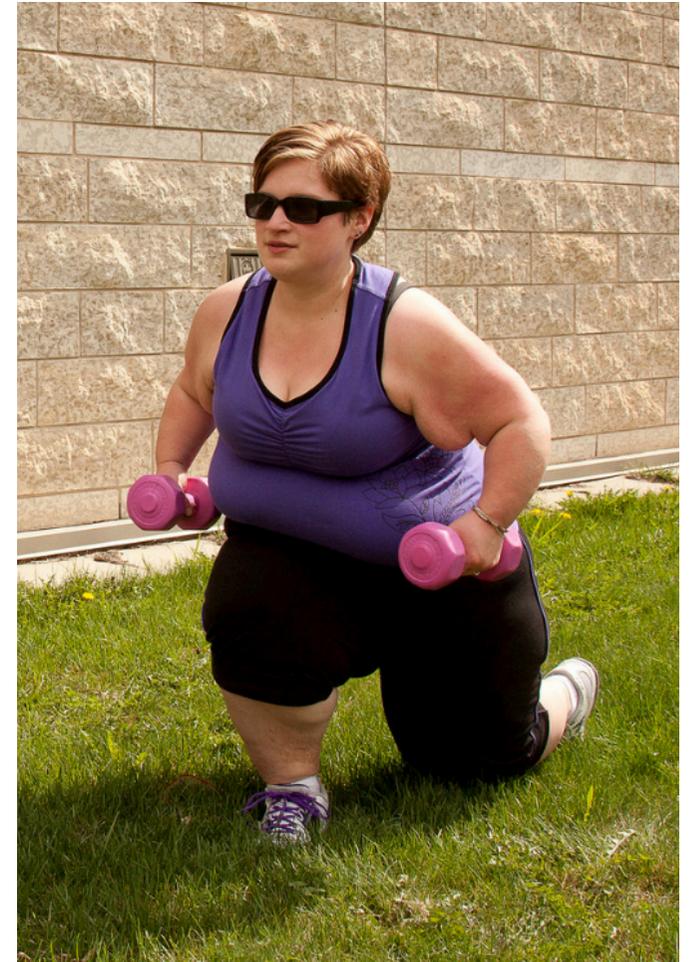
$$\text{Motivation} = \frac{\text{Perceived Chance of Success} \times \text{Perceived Importance of the Goal}}{\text{Perceived Cost} \times \text{Inclination to Remain Sedentary}}$$

START EXERCISE WITH SUPERVISION

- **Exercise training managed by an adapted physical activity specialist (expertise in chronic conditions).**
- **Main primary aims:** change/reinforce attitude, teach exercise modalities and techniques adapted to people with obesity, seek for pleasantness and adherence.
- **Major attentions:** observe individual response (sign and symptoms), reassure. Avoid excessive fatigue, reduce the risk of side effects,
- **Secondary aims:** improve conditioning, create safe conditions, consolidate individual objectives.

FOLLOW-UP and PROGRESSION

- **Follow-up:** new field/lab evaluation (retest, adapt, reinforce)
- **Follow-up:** by telephone, email.
- **Progression:** when considering to modify the frequency, volume, and intensity, take into account the different time to adapt between the CV system, the muscular system, the articular cartilage,



CONCLUSIONS

- In patients with severe obesity the exercise programs should always be tailored to the individual conditions and preferences, taking into account potential contraindications or limitations, and targeting behavioural changes and long-term adherence.



Discussion

○ Questions?

“ Discussion
time
”