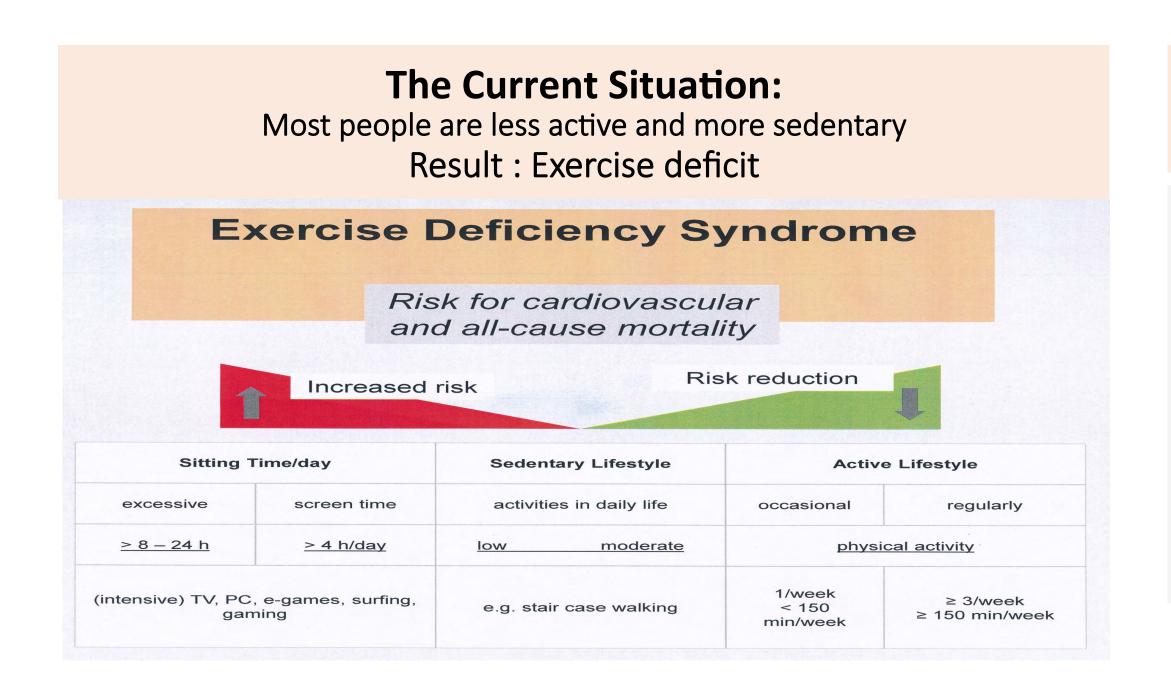
Hypothesis: **Exercise prescription for Health may enhance physical activity**

- Regular physical activity is strongly assciated with lower non-communicable diseases in prevention, therapy and rehabilitation.
- Conversly, sedentary behaviour or exercise deficiency syndrom has been associated with several chronic conditions. Since many years, exercise prescription was suggested besides brief advices and motivational interviewing as an approach to motivate healthy persons and patients, starting with and adherence to regular physical activity.
- This is confirmed by a selective review of EPH indicating positive results and exercise adherence



Prescription of Regular Exercise How it got started: Studies and Results

- Gossner Germany 1982. Recipe for Sports (no acceptance)
- Swinburn, NZ 1998: Ex. Prescription N= 456, 6-12 months positive longer adherence, more amount of exercise
- Smith, 2000: Prescription alone is not enough, need some written material Cummiskey, 2013: ex. deficiency syndrome and ex prescription for health Elly, 2014 (n= 878): 12 months, significant increase of exercise amount Löllgen, Zupet: 2015: Ex. prescription and Training recommendations Exercise prescription with written FITT data

- However, quality of these studies are partially low – Endpoints: fitness, short duration, lack of hard endpoints,

Some more Studies on Exercise Prescription Most studies with positive results

- Sörensen 2006 MetaAnalysis, 22 studies, Verum: 5 -10% increase adherence, CRFitness increased
- Thornton, 2016: Canada Exprescription, no additional material
- Onerup 2018, 9 Studies, n= 642; 5 RCT positive results (adherence, amount), test 6min walk
- <u>Own Studies</u>: Diabetes, COPD, Hypertension: _FITT principle**(not yet finished): FITT principal and personalized
- EPH: Frequency, Intensity, Time (session), Type, Progression, Strength
- Personalized: V02max (dir., indir.) Disease or Health, % of FITT Swedish Book, ACSM –book and more references (Guidelines)

Exercise Prescription for Health as an Approach for Motivating to Physical Activity							
Petra Zupet*, <u>Herbert Löllgen**</u> , Andre Debruyne***, Norbert Bachl****							
*Institute of Sports Medicine, Ljubljana, SL, **Practice Sports Cardiology, Remscheid, Ger,***University of Hasselt, B, ****Institute of Sports Medicine, Vienna, A							
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Health Definition including Self Responsibility as an Approach to motivate healthy Persons and Patients.	Exerc General recom	Training re mendations: Warn	tion for heal ecommendation for ning up about 3 to 5	th: Personand or prevention and min, cooling down 3	alized advice therapy in diseas – 5 min, flexibility trai	e with FITT-I es (© EFSMA) ining daily	
as an Approach to motivate healthy Persons and Patients.	Exerc General recom	ise prescript Training re mendations: Warn	tion for heal ecommendation for ning up about 3 to 5	th: Persona	alized advice therapy in diseas – 5 min, flexibility trai	e with FITT-I es (© EFSMA) ining daily	
as an Approach to motivate healthy Persons and Patients.	Exerc General recom	ise prescript Training re mendations: Warn	tion for heal ecommendation fe ning up about 3 to 5 viations, Kind of spor	th: Personand or prevention and min, cooling down 3	alized advice therapy in diseas – 5 min, flexibility trai	e with FITT-I es (© EFSMA) ining daily	
as an Approach to motivate healthy Persons and Patients. Health is defined by	Exerc General recom	ise prescript Training re mendations: Warn r RPE – Scale, Abbrev	tion for heal ecommendation fe ning up about 3 to 5 viations, Kind of spor Intensity Low intensity: 40–65 % HRmax	th : Persona or prevention and min, cooling down 3 rts, and HITT: High int Time (duration) Low intensity: > 30min/session	alized advice therapy in diseas – 5 min, flexibility trai	e with FITT-I es (© EFSMA) ining daily ining daily ining see below) Type of sports Running, walking,	Principle Strength training 70 % of 1RM
as an Approach to motivate healthy Persons and Patients. Health is defined by Genes (Genetics) (about <u>15 %</u>)	Exerc General recom (For Borg-Scale of Prevention in	ise prescript Training re mendations: Warn r RPE – Scale, Abbrev Frequency/Week Low intensity: 5/week	tion for heal ecommendation for ning up about 3 to 5 viations, Kind of spor Intensity Low intensity: 40–65 % HRmax RPE 10-13	th : Persona or prevention and min, cooling down 3 rts, and HITT: High int Time (duration) Low intensity: > 30min/session or 150min/week	alized advice therapy in diseas – 5 min, flexibility trai tensity interval trainin Type of training Endurance,	e with FITT-I es (© EFSMA) ining daily g see below) Type of sports Running, walking, cycling, swimming,	Principle Strength training
as an Approach to motivate healthy Persons and Patients. Health is defined by ➤ Genes (Genetics) (about 15 %) ➤ Environment (e.g particular matter, passive smoking)	Exerc General recom (For Borg-Scale of Prevention in	ise prescript Training re mendations: Warn r RPE – Scale, Abbrev Frequency/Week	tion for heal ecommendation fe ning up about 3 to 5 viations, Kind of spor Intensity Low intensity: 40–65 % HRmax RPE 10-13 Vigorous intensity: 65-85 % HRmax	th : Persona or prevention and min, cooling down 3 - rts, and HITT: High int Time (duration) Low intensity: > 30min/session or 150min/week Vigorous intensity: > 25/min/session	alized advice therapy in diseas – 5 min, flexibility trai tensity interval trainin Type of training Endurance,	e with FITT-I es (© EFSMA) ining daily g see below) Type of sports Running, walking, cycling,	Principle Strength training 70 % of 1RM > 2-3/week, 10-15 reps, 1
 as an Approach to motivate healthy Persons and Patients. Health is defined by Genes (Genetics) (about <u>15 %</u>) Environment (e.g., particular matter, passive smoking) social and "livable" environment, (i.e. population based interventions) 	Exerc General recom (For Borg-Scale of Prevention in general	ise prescript Training remendations: Warn r RPE – Scale, Abbrev Frequency/Week Low intensity: 5/week Vigorous intensity: 3/week 3–5/week Vigorous intensity:	tion for heal ecommendation for ning up about 3 to 5 viations, Kind of spor Intensity Low intensity: 40–65 % HRmax RPE 10-13 Vigorous intensity:	th : Persona or prevention and min, cooling down 3 rts, and HITT: High int Time (duration) Low intensity: > 30min/session or 150min/week Vigorous intensity:	alized advice therapy in diseas – 5 min, flexibility trai tensity interval trainin Type of training Endurance,	e with FITT-I es (© EFSMA) ining daily ining daily ining, ining, ining, ining, ining, ining, ining, ining, ining, ining, ining, ining, ining, ining,	Principle Strength training 70 % of 1RM > 2-3/week, 10-15 reps, 1
 as an Approach to motivate healthy Persons and Patients. Health is defined by Genes (Genetics) (about <u>15 %</u>) Environment (e.g particular matter, passive smoking) social and "livable" environment, (i.e. population based interventions) and adequate healthcare provision (about <u>35 %</u>) However: Health-conscious lifestyle (= active lifestyle) 	Exerc General recom (For Borg-Scale of Prevention in general © EFSMA Coronary heart	ise prescript Training remendations: Warn RPE – Scale, Abbrev Frequency/Week Low intensity: 5/week Vigorous intensity: 3/week 3–5/week	Lion for healcommendation foring up about 3 to 5viations, Kind of spotIntensityLow intensity:40-65 % HRmaxRPE 10-13Vigorousintensity:65-85 % HRmaxRPE > 13-1650-80 % V02maxor40-70 % HRmax	th : Persona or prevention and min, cooling down 3 rts, and HITT: High int Time (duration) Low intensity: > 30min/session or 150min/week Vigorous intensity: > 25/min/session or 75min/week 40-60 min/session	alized advice therapy in diseas – 5 min, flexibility trai tensity interval training Type of training Endurance, strength.	e with FITT-I es (© EFSMA) ining daily g see below) Type of sports Running, walking, cycling, swimming, skating, cross-country ski. Running, walking, cycling,	Strength training 70 % of 1RM > 2-3/week, 10-15 reps, 1 3 sets. 60-75 % of 1RM, > 2/week, 8–12 reps,

The EFSMA Project : Step by Step to improve Physical activity by **Exercise Prescription for Health**

- <u>5th Vital Sign</u> is regular exercise: for the records (Sallis, 2011, Thornton, 2016):
- Every doctor at every contact with patient has to ask for regular physical activity (EFSMA, 2013)
- Brief Advice : is cost effective, works. Studies vary in quality duration, cost effectiveness (Vijay, 2016)
- Exercise Prescription for Health
- Most studies so far are positive for short time adherence
- Own studies on Hypertension, Diabetes, COPD not yet finished.



EFSMA: European Federation of Sports Medicine Associations

> **The EFSMA Project** EPH in 28 countries

ENDURANCE TRAININGx/wk, each Min raining Heartrate: Borg-Value: rming up: 5 min, cooling down: 5 min Ergometer Training ...Watt/ ...min for warming upWatt/min...... minutes STRENGTH TRAINING% 1RM REPs SETs .muscle groups Gymnastics/ Balance/Coordination ...wk each.....minwk each.....min Ball Games Others (Golf, Dance,... .wk each Sport Physician .. Date:

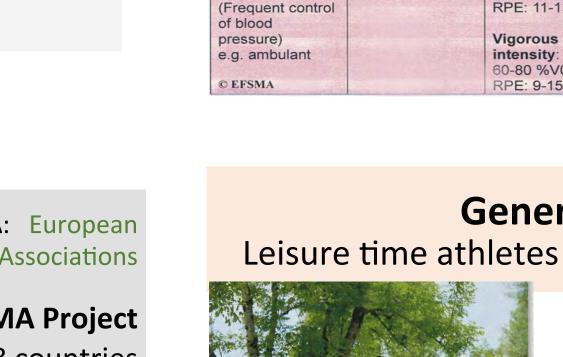
Exercise Prescription for Health (EPH) used in 28 countries by means of the FITT Principle and Training recommendations as personalized medicine

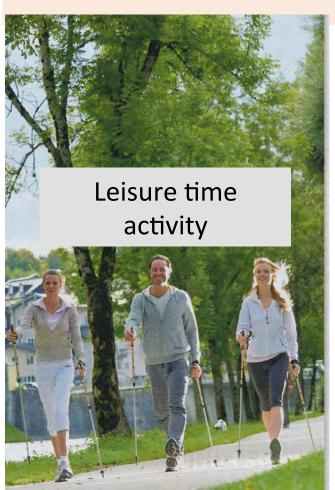
In case of dyspnoe, irregular heart beats, chest pain or dizziness stop activity and counsel your doctor.

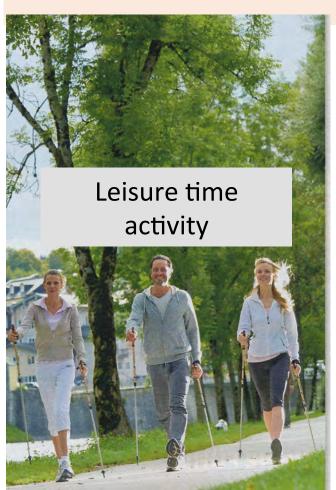
Flow Chart for Training Recommendations (Algorithm in preparation)

- Age, Sex, Height, Weight, Heart rate Select, Insert: Calculate V02max (Myers formula) Check Disease, Cardiac Dysfunction, Strain Calculate % of training load, moderate, vigorous table of recommendation and choose Check FITT data Give a copy or printout of the Recipe to the patient

- discharge.







Heart Failu

© EFSMA

Rhythm Disturbance

© EFSMA

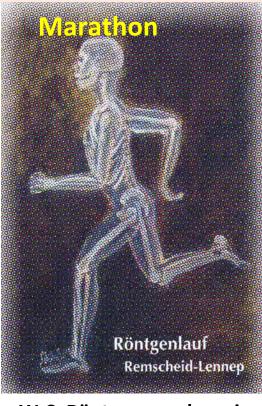
Arterial Hypertensic

Training Recommendation with FITT Data (28 diseases)

1.9%	Frequency/Week	Intensity	Time (duration)	Type of training	Type of sports	Strength training
ire	3–5/week	Low – moderate intensity: 40-60 %Vo2max RPE 11- 15 HITT*: with 90% 4 min and 3 min pause in between	15-60 min/session HITT* : for details see below	Endurance, strength, combination, respiratory muscle training (30% of max insp. pressure).	Jogging, (Nordic) walking, cycling, aerobics, cross-country ski.	60-75 % of 1RM, 2-5/week, 8–12 reps, 2-3 sets, RPE local 13-15.
es	3 – 5 /week 2 – 3 /week	Moderate intensity: 40–60 %V0 ₂ max, RPE: 11- 13 Vigorous intensity: 60-80 %V0 ₂ max	30-60 min/session	Endurance, flexibility, sensomotoric, muscle, endurance.	Running, nordic ski, aerobics, cycling.	40–60 % of 1 RM, 12-15 reps, 3 sets, 8 -10 exercises, RPE 11-13 (- 19).
		RPE: 9 - 15	20-30 min/session			
on htrol	3 – 5 (7) /week 2 -3 (4)/week	Moderate intensity: 40-60 %V0 ₂ max, RPE: 11-13	30-45 min/session	Endurance, flexibility, senso-motoric, muscle endurance.	Jogging, (Nordic) walking, swimming, scating, aerobics, dance,	60-75 % of 1RM, 2-5/week, 8–12 reps, 2-3 sets, RPE local 13-15.
ŧ		Vigorous intensity: 60-80 %V0 ₂ max RPE: 9-15	20-30 min/session		cycling.	

General Recommendations

, trained & con	npetitive athletes
E.F.S.M.A.	Menelmon
European Federation of Sports Medicine Associations Recognised by the International Federation of Sports Medicine (F.I.M.S.)	
E.F.S.M.A. SCIENCE & EDUCATION IN STORTS MEDICINE There is a strong relationship between exercise and health. Physical activity is essential	
to good health and quality of life. EXERCISE PRESCRIPTION FOR HEALTH	
recommendations for physical activity in adults and children: Adults: For health and life At least 30 minutes of regular moderate aerobic physical activity	
5 days per week or a total of 150 min per week, OR At least 25 min of regular vigorous aerobic physical activity at least 3 days per week of a total of 75 min per week AND moderate to intense strength training at least 2 times per week.	Röntgenlauf Remscheid-Lennep
For children: Daily moderate or vigorous physical activity for at least 60 min per session composed of endurance, flexibility, balance and muscular endurance training. At least 60 min of physical activity per day.	W.C. Röntgen was born in Remscheid



Conclusion

• Exercise Prescription for Health may be an important approach for motivating people to **regular physical activity** and **adherence.**

• In addition, the described method for **training recommendation** in healthy and diseased people is a strictly personalized approach considering state of disease, cardiorespiratory fitness and type of activity.

EPH gives written **personalized recommendations** using the FITT table and underlying health or disease

• There is a large **deficiency in hospitals** when discharging patients:

• They have large lists of drugs, but **no specific and precise** recipe for lifestyle **and not** especially for regular physical activity after