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III CONGRESO INTERNACIONAL

Mujer y Montaña

2nd International Congress Hiking and Mountain Sports

3rd International Congress Women and Mountain

PERFORMANCE AND COMPETITION AREA

LECTURE: Contents and Factors to consider in a Planification of a High Performane **Female Trail Runners**

Prof. Arcadi Margarit























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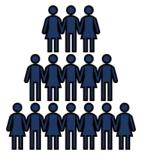
ELITE FEMALE TRAIL RUNNING



FASTER SPEEDS



MORE PROFESSIONALIZATION



NUMBER OF TOP LEVEL ATHLETES IS INCREASING



ATHLETES MORE
PREPARED & SPECIALIZED























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ELITE FEMALE TRAIL RUNNINNIG





GOLDEN Trail Series Final (2024)



OCC 2022



WORLD CHAMPIONSHIP Classic (2023)

OCC 2024









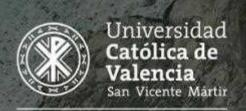














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FACTORS TO GET THE TOP LEVEL PERFORMANCE











TALENT

OPPORTUNITIES

LUCK

GOAL-SETTING ('goal-oriented')

MENTAL SKILLS











CONSISTENCY







HEALTH

Adapted from 'How to Succed as an Athlete: What We Know, What We Need to Know' (Foster et al. 2021).



FOCUS ON LONG

TERM AND HOLLISTIC

DEVELOPMENT





















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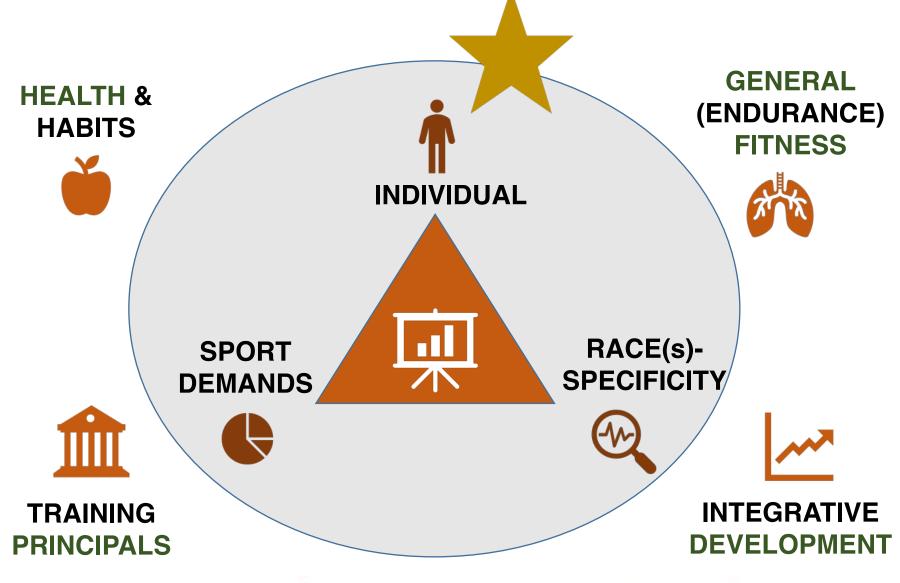
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ANNUAL(s) PLANNING & TRAINING PROCESS

























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AS A STARTING POINT: (GENERAL) SEX DIFFERENCES IN PERFORMANCE

WOMEN ADVANTAGES



MORE % TYPE I FIBERS (LESS POTENCIALLY MUSCLE DAMAGE)



LOWER TIME TO RECOVER



LESS FATIGUE DURING RACES (BETTER DURABILITY)



BETTER PACING STRATEGY AND SUFFERING CAPACITY



SLIGTHLY BETTER FAT OXIDATION CAPACITY & METABOLIC FLEXIBILITY

MEN ADVANTAGES



HIGHER MAXIMAL OXYGEN UPTAKE AND O2 CARRYNG CAPACITY



HIGHER RELATIVE AND ABSOLUTE STRENGTH LEVELS, TORQUE AND 'AT STIFFNESS'



HIGHER TENDENCY TO TAKE RISKS



LARGER MUSCLE MASS AND LOWER BODY FAT LEVELS



LONGER, MORE DENSE AND STRONGER BONES

Adapted from Sex Differences in Endurance Running. (Besson et al. 2022; 2023); Sex differences in human performance. (Hunter et al. 2024)























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RUNNING PERFORMANCE SEX DIFFERENCES

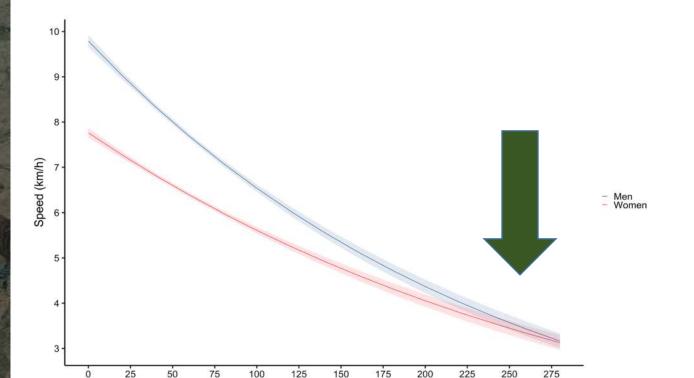
~10%-30% SEX DIFFERENCE IN ATHLETIC PERFORMANCE

(Angadi et al, 2023)

'10% RULE' in RUNNING endurance performance.

The GAP is reduced until 1-3% in ULTRADISTANCE

(Tiller & Illidi, 2024)



'the gap between men and women shrinks when trail running distance increases, which demonstrates that ENDURANCE is greater in WOMEN'

Running Endurance in Women Compared to Men: Retrospective Analysis of Matched Real-World Big Data. Le Mat et al. (2023).







km effort (a.u.)

















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IS THE GAP REALLY REDUCING?







THE SPINE RACE 2019 (450KM): JASMIN PARIS CAMPEONA ABSOLUTA Y NUEVO RECORD 83H12M, REDUCIENDO EN 12 HORAS EL ANTERIOR. CRÓNICA Y FOTOS.

La última hazaña de Courtney Dauwalter: solo un hombre, el español Cristofer Clemente, le gana en Costa Azul

La mejor corredora del mundo de trail running saca más de cinco horas de ventaja a la segunda en la prueba de 100 millas de Costa Azul by UTMB en Niza y se queda a 13 minutos de la victoria absoluta























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IT IS NOT ONLY ABOUT SEX DIFFERENCES...



CAPACITIES







METABOLISM

FITNESS TESTING

ARTHRO-MUSCULAR TESTING



IT IS ABOUT INDIVIDUALITY!!

ORT



TRAINING PREFERENCES



RESPONSES AT DIFFERENTS ENVIROMENTS



VOLUME TOLERANCE



BACKGROUND & PREVIOUS YEARS























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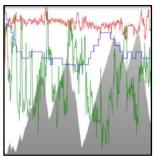
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...BUT DO NOT FORGET SPORT & RACE-DEMANDS

Trail running CHARACTERITZATION



INTENSITY VARIABILITY



OROGRAPHY: ELEVATION GAIN, RACE-PROFILE AND ALTITUDE

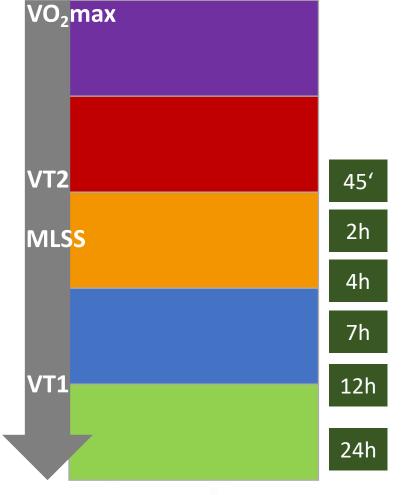


TERRAIN & LEVEL OF TECHNICITY



IMPORTANCE
OF MODES OF
LOCOMOTION

Average INTENSITY in trail running competitions

























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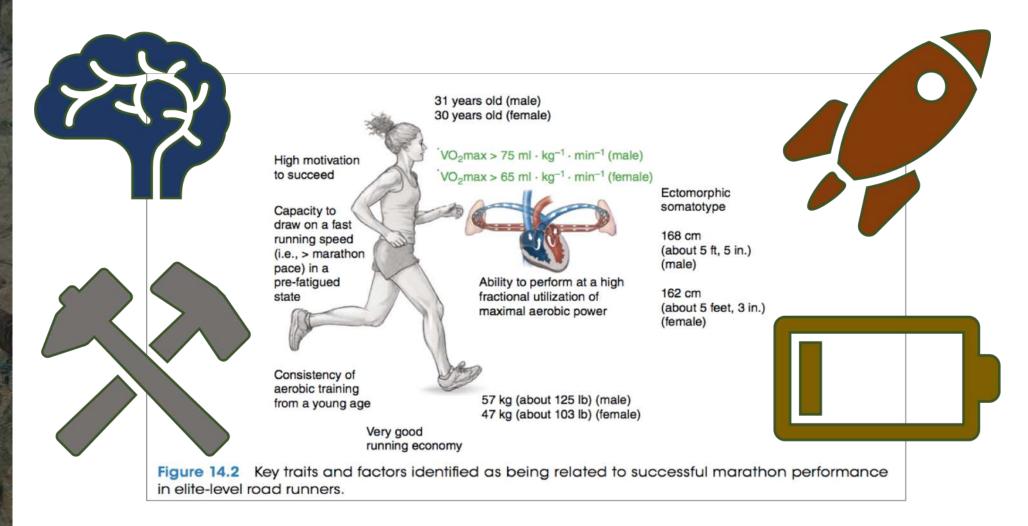
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SAME GOAL: TUNE THE ENGINE



Laursen & Buchheit (2019). Science and Application of the High-Intensity Interval Training.





















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SAME GOAL, BUT DIFFERENT ROAD?

GENERAL 'ROAD'...

VOLUME as a KEY component in BOTH female and men elite endurance runners



NO DIFFERENCES in **INTENSITY distribution**



'KEY TRAINING PRINCIPLES mainly adjusted to the INDIVIDUAL ATHLETE, rather than GENDER'



BUT, TRAINING DIFFERENCES ARE NEEDED

in PHYSIOLOGY & **PSYCHOLOGY** (and competitions demands) are **CONSIDERED**

SEX-SPECIFIC DIFFERENCES 7 OUT OF 10 COACHES OF ELITE TRAIL RUNNERS PRESCRIBE TRAINING DIFFERENTLY **ACCORDING TO SEX**

> (Preliminary study. Training in trail running - learning from the experts)

CONSIDERATION OF SEX IN THE PRESCRIPTION IS **KEY TO OPTIMIZING ADAPTATIONS IN** ATHLETIC PERFORMANCE









The training of international level distance runners (Tjelta, 2016).



Training and Coaching of Female vs. Male Endurance Athletes on their Road to Gold. Perceptions among Successful Elite Athlete Coaches. Sandbakk et al. (2022).



Physiological sex differences affect the integrative response to exercise: acute and chronic implications (Andersen et al., 2021)





















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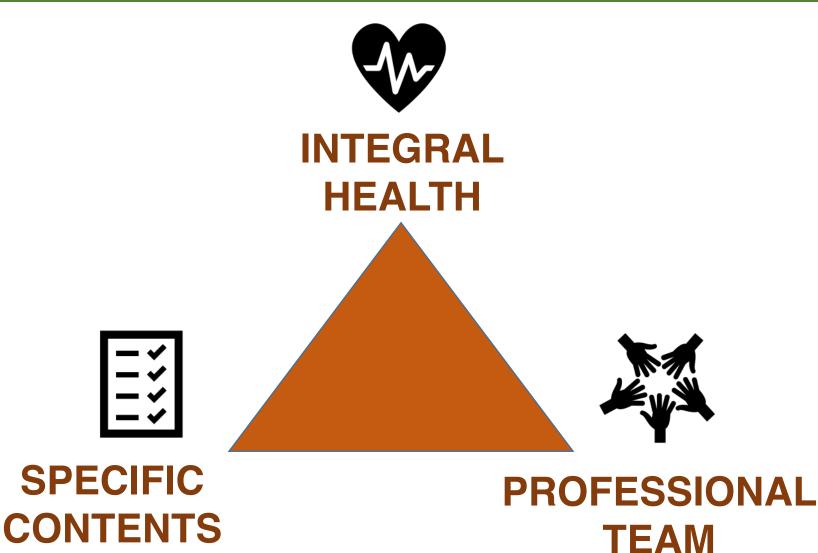
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THE 'BIG THREE' ON THE ROAD

























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THE BASE: NO HEALTH, NO PARTY

NUTRITION ESTRATEGIES & POTENCIAL DEFFIENCIES









'STRUCTURAL' CARE, **ANTHROPOMETRY & BODY COMPOSITION**



STAGES & PERIODS OF LIFE



MENSTRUAL

CYCLE

SPECIAL & KEY ASPECTS OF WOMEN HEALTH





HEMATOLOGIC TESTS MONITORING























PELVIC FLOOR CARE







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HOW DIFFERENTLY? TRAINING CONTENTS & STRATEGIES









HEAVY-LOAD STRENGTH TRAINING

OSTEOGENIC STIMULI (i.e plyometrics) PELVIC FLOOR, **HIP & CORE EXERCISES**

ADJUST TRAINING TO **MENSTRUAL CYCLE**





CONSIDER INDIVIDUAL

PHYSIOLOGY (for recovering,

tapering...)

& PERFORMANCE

FACTORS (psicology, skills...)



SPECIFIC SCREENINGS & DAILY MONITORING



CONSIDER SOCIAL & CULTURAL **ASPECTS**























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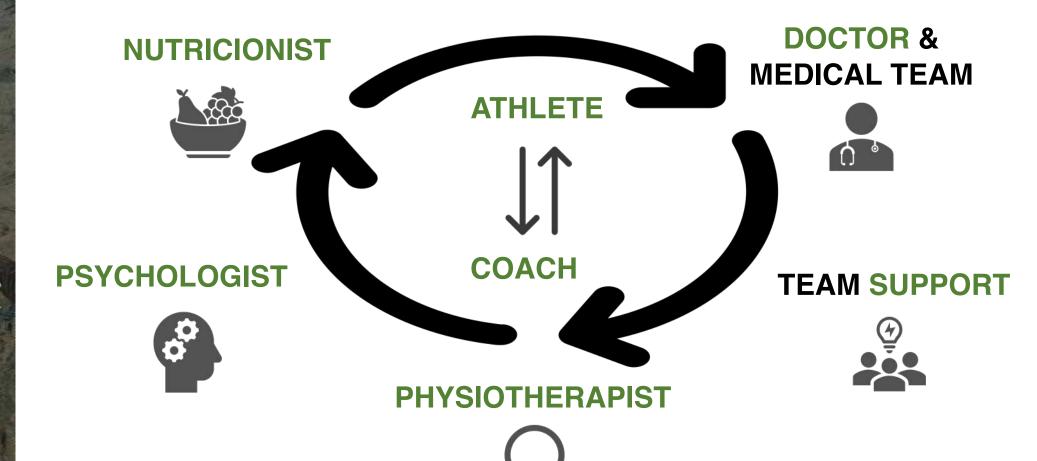
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IT IS NEEDED: COMMUNICATION & TEAM MODEL

























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KEY POINTS

2. RESPECT GENERAL TRAINING PRINCIPLES TO PLAN

4. BUT, SPECIALLY
INDIVIDUALIZE
ACCORDING SUBJECT
FEATURES



1. PERFORMANCE LEVEL IS NOTABLY INCREASING

5. ... AND SPECIFIC CONTENTS & MONITORING ARE NEEDED



















