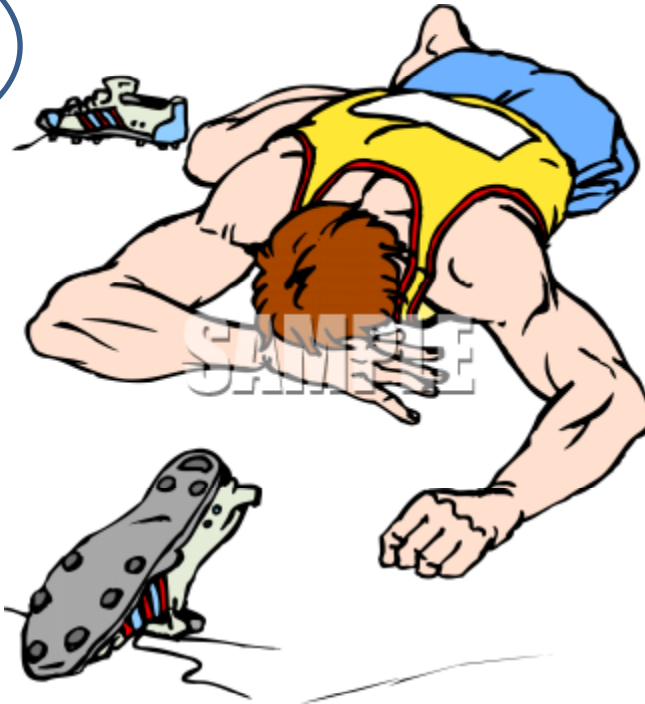




A COMPROMISED OXYGEN UPTAKE SYSTEM

IT'S NOT IN YOUR
HEAD!!!!



ALWAYS ALWAYS ALWAYS

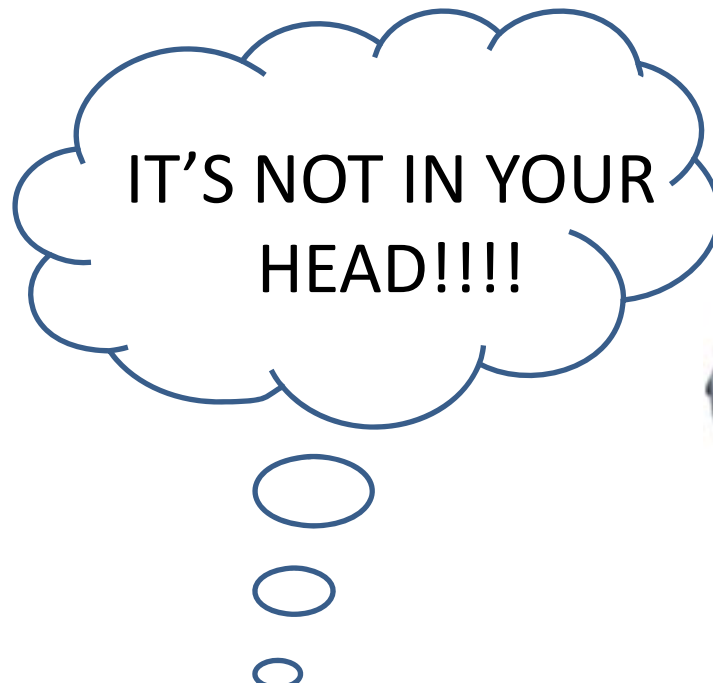
RULE OUT MEDICAL BEFORE JUMP TO MENTAL -EMOTIONAL!!!



A COMPROMISED OXYGEN UPTAKE SYSTEM

KATHERIN'S STORY

MEGAN'S STORY





A COMPROMISED OXYGEN UPTAKE SYSTEM

UNDERSTANDING IRON AND THE ROLE IT PLAYS IN
TRANSPORTING OXYGEN

WHAT IS FERRITIN IRON

TESTING FOR IRON LEVELS

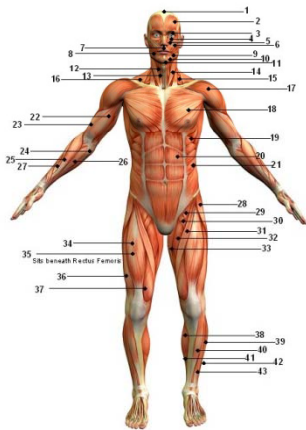
WHY GIRLS ARE AFFECTED MORE THAN BOYS

WHAT CAN YOU DO IF YOU ARE SHOWING A LOW
FERRITIN IRON LEVELS

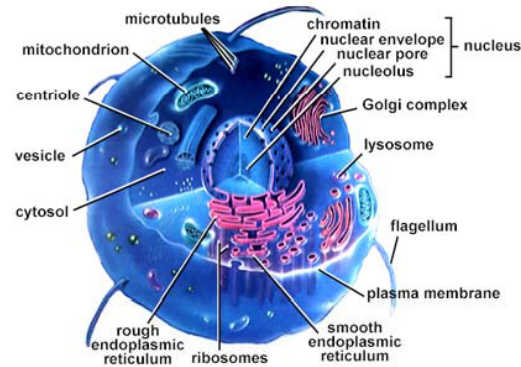




OUR BODIES



=

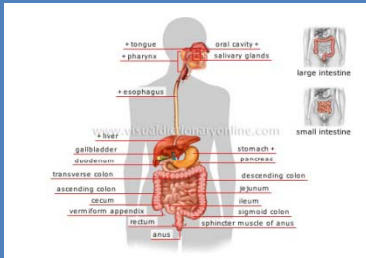


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v10004b023 fotosearch.com

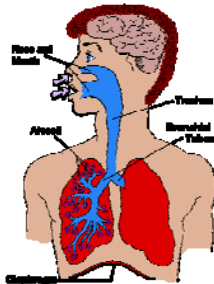
OUR BODIES = **CELLS** organized into many different specialized **ORGANS and TISSUES** = **PERFORM MANY DIFFERENT FUNCTIONS**



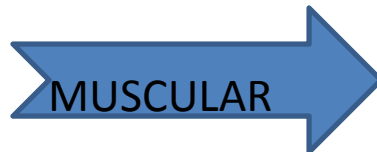
A FEW BODY SYSTEMS



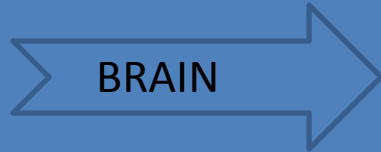
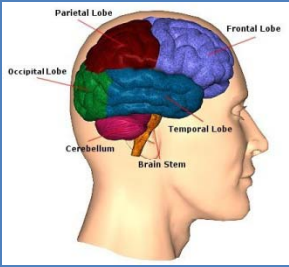
DIGESTS FOOD – nutrients distributed to rest of body



OXYGEN – taken from air and release **CARBON DIOXIDE** as waste.

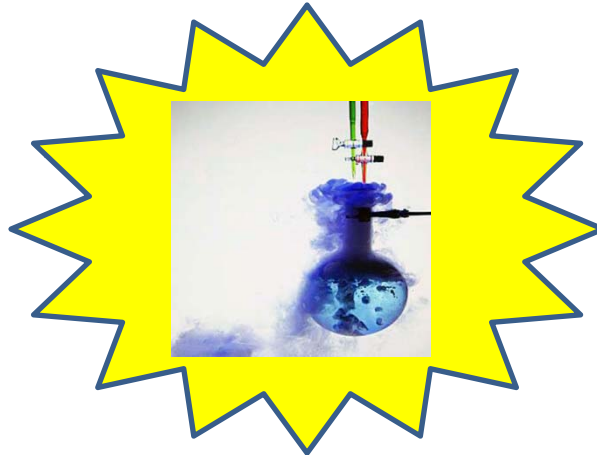


BODY MOVEMENT

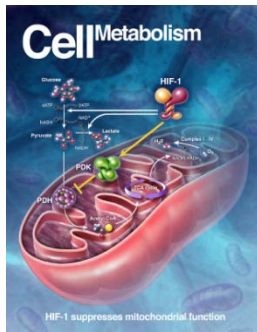


**COORDINATES ALL SYSTEMS AND
MANY MORE
(STOMACH, LUNGS, MUSCULAR, ETC)**

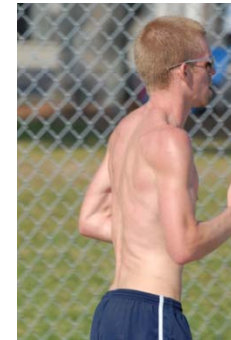
ALL PROCESS ARE BASED UPON MANY DIFFERENT



CHEMICAL REACTION



CELL

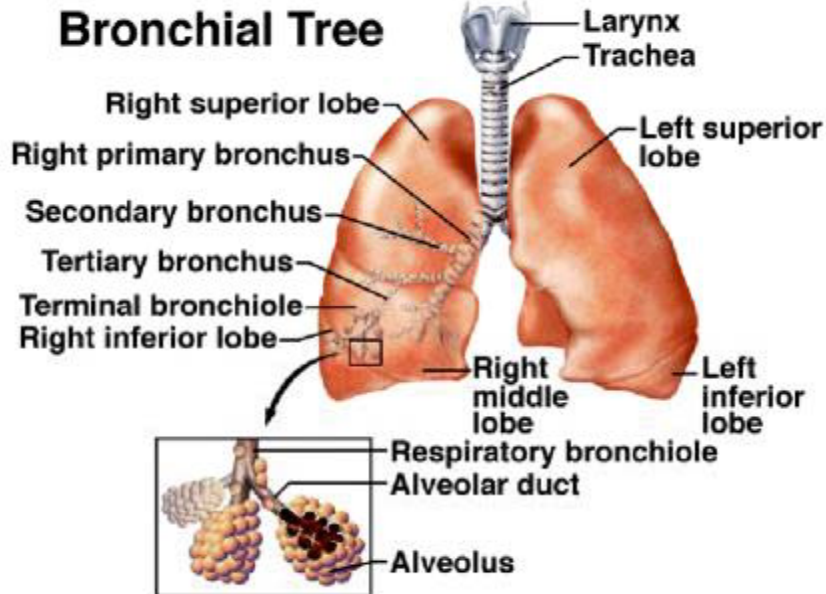


SYSTEM

METABOLISM

OXYGEN TRANSPORT SYSTEM

Shier/Blatt/Lewis, *Hole's Human Anatomy and Physiology*, 8th edition, Copyright © 1999, The McGraw-Hill Companies, Inc. All rights reserved.



RESTING ADULT

250 ml OXYGEN PER MINUTE

O₂



EXERCISE

**ONLY 1.5%
ABSORBED DIRECTLY
BLOOD PLASMA**

OXYGEN TRANSPORT SYSTEM

BULK OF OXYGEN

OXYGEN TRANSPORT VIA

METAL complex

Called

HEME



HEME – Deep red, nonprotein, iron-containing component carrying oxygen

OXYGEN TRANSPORT SYSTEM

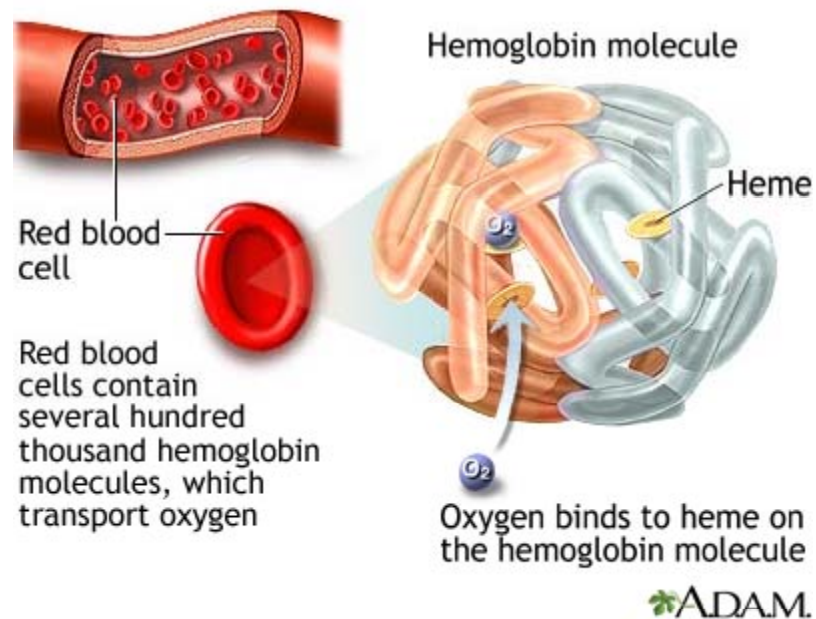
WHY THE MOST IMPORTANT METAL?



IRON

Without this metal in the system the body will not be able to create energy

HOW BODY REGULATES IRON

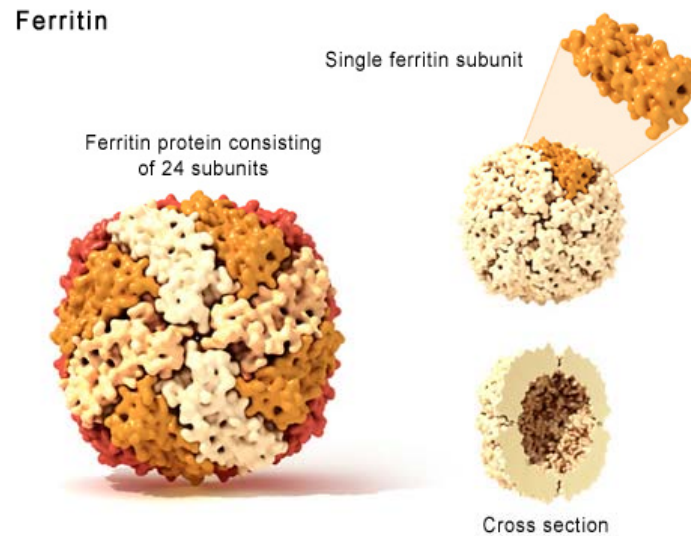


Hemoglobin – maintains iron in the blood

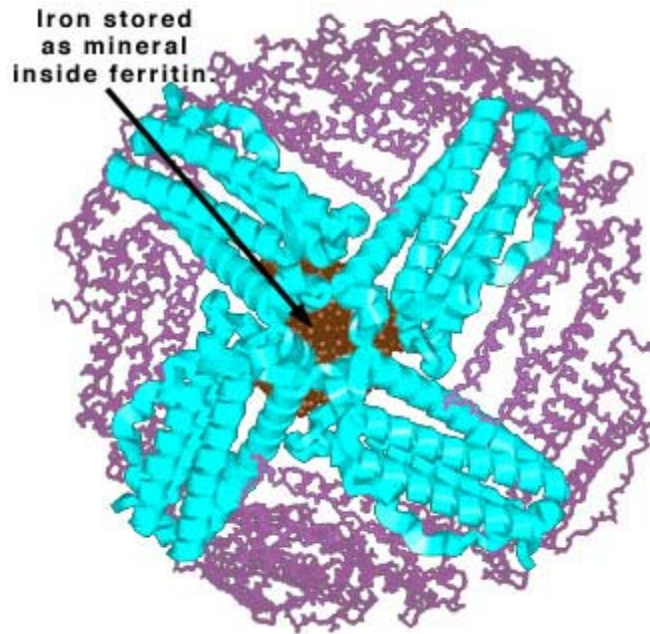
FERRITIN

is a type of protein produced in our body and its main purpose is to store iron.

They are iron storing proteins and is of the many constituents of the blood. People with low ferritin levels are at a great risk of suffering from iron deficiency.



HOW BODY REGULATES IRON



Hemoglobin – maintains iron in the blood



Ferritin is a protein that stores
And releases the iron in a controlled
fashion.

- * **Buffer against iron Deficiency**
- * **Blood has too little iron the ferritin can release more**
- * **Blood has too much iron the ferritin can store the iron**



IRON TESTS

FINGER PRICK TEST



Hemoglobin:
Iron: 60-170 mcg/dL
TIBC: 240-450 mcg/dL
Transferrin saturation: 20-50%



CBC BLOOD TEST
(does not include
Ferritin test)

Most Doctors will only do finger prick test!!

DO NOT BLAME THEM!!

TALK PARENT OUT OF NEXT TEST

DO NOT BLAME THEM!!

IRON TESTS
Measures binding
levels and hemoglobin
NOT FERRITIN



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IRON TESTS

FERRITIN TEST (IRON STORES)



Must ask for and
sometimes
demand FERRITIN
Blood test



Bring in literature
to make case

The Roche ECLIA reference ranges for ferritin
MALES: 30-400 ng/mL for males
FEMALES: 13-150 ng/mL for females



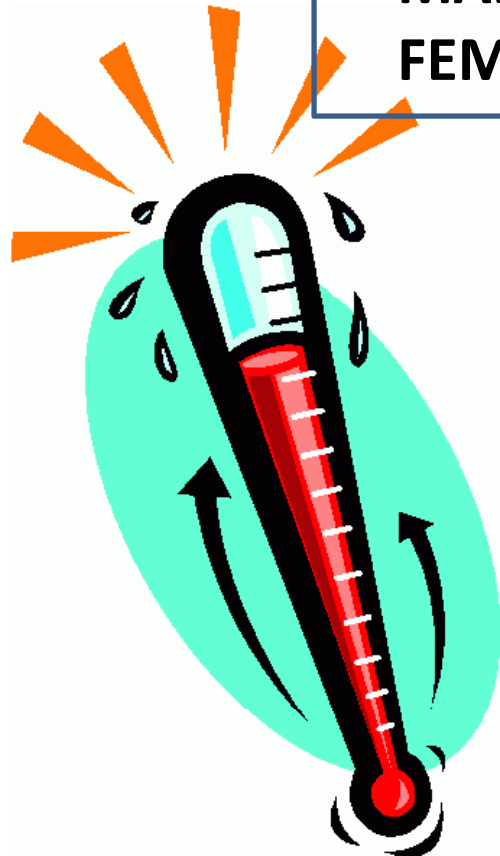
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WHAT IS LOW FERRITIN

The Roche ECLIA reference ranges for ferritin

MALES: 30-400 ng/mL for males

FEMALES: 13-150 ng/mL for females



BELOW 10 VERY VERY BAD

10 – 30 VERY BAD

30 – 49 BAD

50 + GOOD

80 + VERY GOOD

100+ VERY VERY GOOD

*Dr.'s will only say you
blood tests came
back normal
MUST ASK NUMBER*





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LOW FERRITIN DOCTORS VS DIST. RUNNER

The Roche ECLIA reference ranges for ferritin
MALES: 30-400 ng/mL for males
FEMALES: 13-150 ng/mL for females

*Dr.'s will anything
Within the range
Is OK*



BELOW 10 VERY VERY BAD

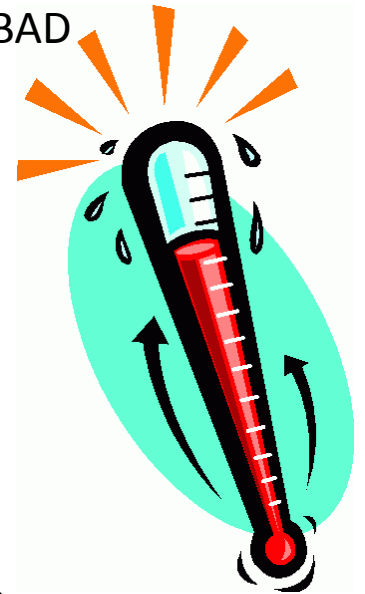
10 – 30 VERY BAD

30 – 49 BAD

50 + GOOD

80 + VERY GOOD

100+ VERY VERY GOOD



SIGNS OF LOW FERRITIN

DOCTORS VS OXYGEN SPORTS



1. Fatigue
2. Decrease in energy
3. Hair loss
4. Thyroid Problems
5. Pale, cold skin and brittle nails
6. Restless leg syndrome
7. ADHD and ADD

1. Fatigue about 1 mile into race
2. Athlete turns pale &/or lips turn blue
3. Breathing problems develop
4. Workouts go great but can't put it together in racing
5. Passing out during racing
6. Grades can start falling
7. Depression
8. Overtraining





WHY IRON STORES BECOME LOW

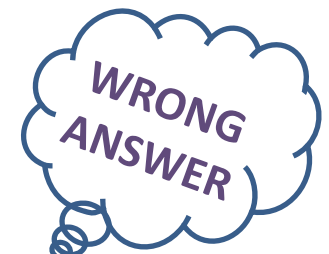
NUTRITION

- * Not eating iron rich foods (red meats)
- * Dieting
- * Caffeine
- * etc.

LOSS OF BLOOD IN THE BODY

- * Gastro-intestine: Ulcers and reflux
- * Crunching red blood cells in feet
- * heavy periods for girls
- * etc.

NUTRITION





WHY GIRLS AFFECTED MORE

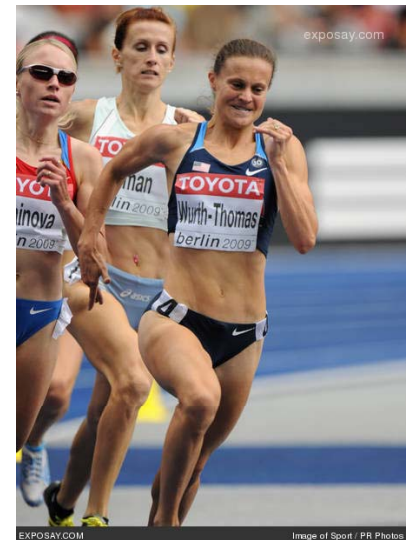
- MENSTRAL CYCLE
 - TURNING ON SYSTEM
 - IRREGULAR MENSTRAL CYCLE
 - HEAVY MENSTRAL CYCLES
- BODY CHANGES AND STRESSES
- METOBOLIC SYSTEM COMPROMISED
- STRESS EMOTIONALLY
- STRESS OF CHANGING BODY AND NUTRITION





WHAT CAN COACHES DO?

- CREATE A POSITIVE ENVIRONMENT EDUCATIONAL ENVIRONMENT
- EDUCATE PARENTS AND ATHLETES ON NUTRITION
 - Continually discuss positive nutrition habits to the team
 - Provide literature
- ENCOURAGE PARENTS TO GET ATHLETES FERRITIN IRON TESTED
- TEST EVERY 3 – 6 MONTHS
 - Don't wait until iron is a problem
 - Keep track of numbers
- IF LOW BE POSITIVE TO ATHLETE



NUTRITION NUTRITION NUTRITION NUTRITION

Iron Rich Food containing Heme Iron

Excellent source

Clams
Pork Liver
Oysters
Chicken Liver
Mussels
Beef Liver

Good Source

Beef
Shrimp
Sardines
Turkey

Iron Rich Foods containing Non-Heme Iron

Excellent Sources

Enriched Breakfast Cereals
Cooked Beans and Lentils
Pumpkin seeds
Blackstrap molasses

Good Sources

Canned Beans
Baked potato with skins
Canned asparagus

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NUTRITION NUTRITION NUTRITION NUTRITION

IRON ABSORPTION ENHANCERS

Meat/fish/poultry

Fruit: Orange, OJ, cantaloupe,
strawberries, grapefruit, etc

Vegetables: Broccoli, Brussels sprouts,
tomato, tomato juice, potato, green
and red peppers

White wine

IRON ABSORPTION INHIBITORS

Red Wine, Coffee & Tea Caffeine

Vegetables: Spinach, chard, beet
greens, rhubarb, sweet potato

Whole grain and bran

Soy products



WHAT TO DO IF LOW FERRITIN?

DIET IRON RICH FOODS

RED MEATS – HEME - THE BEST TYPES (quicker absorption)

- * Open range naturally raised meats
- * Wild Game Meats Buffalo, Elk, deer, etc

RECOVERY DRINKS – immediately after workouts within 15

- * Ensure Shakes
- * Endurox R4
- * Slim Fast shakes
- * Iron rich bars
- * Pumpkin seeds



**VEGATARIANS NEED
TO WORK WITH
A NUTRITIONIST!**



WHAT TO DO IF LOW FERRITIN?

TAKING IRON SUPPLIMENTS

PARENTS INVOLVEMENT IS KEY (1 – 2 times a day)

•WORK WITH DOCTOR OR NUTRITIONIST! DIET CHANGES WORKS BEST W/supplements

•TYPES OF IRON SUPPLIMENTS -

- SLOW FE IRON
- IRON
- LIQUID IRON – MUST BE TAKEN WITH A STRAW AND OJ (**not calcium fortified**)
- VITRON – Vitamin C and a slow release IRON COMBINED
- IRON INFUSIONS

WHEN TO TAKE

BEST TAKEN WITH A VITAMINE C
BEST TAKEN ON EMPTY STOMACH
EASIEST AM and PM
MUST RETEST AFTER 8 – 12 WEEKS





OTHER BLOOD TESTS TO CONSIDER

THYROID TEST – low Ferritin levels can lead to low thyroid levels

VITAMIN D LEVELS – Low Vitamin D levels can lead to low bone densities (**RYAN'S STORY**)

CALCIUM SUPPLEMENTS – a good multi-vitamin always recommended

FOR GIRLS AND BOYS



WHAT TO DO IF LOW FERRITIN?

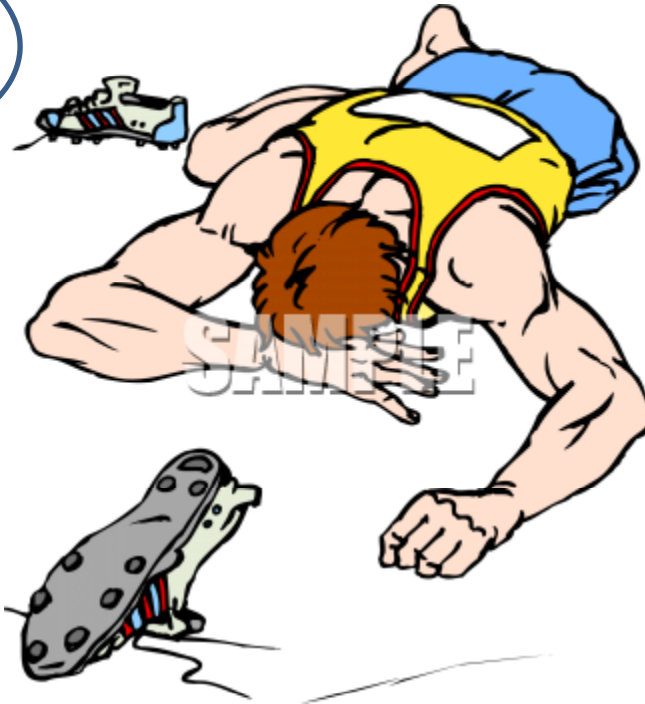
SUMMARY

- Diet is a key
- Supplements
 - MULTI-VITAMIN** GIRLS AND BOYS (do not take iron together)
 - IRON**¹ – 2 times a day with a vitamin C source IF LOW
 - Girls all runners should take once a day if low Ferritin
work with doc and nutritionist 2 x's a day
 - Boys should only take if low Ferritin
 - Must get tested every 8 – 12 weeks if taking supplements
 - VITAMIN C** – everyone should take
 - ***VITAMIN D and CALCIUM SUPPLMENTS** – Only if low levels are recorded



A COMPROMISED OXYGEN UPTAKE SYSTEM

IT'S NOT IN YOUR
HEAD!!!!



ALWAYS ALWAYS ALWAYS

RULE OUT MEDICAL BEFORE JUMP TO MENTAL -EMOTIONAL!!!