

Module 8
Life Stage
Requirements

William Shakespeare's *As You Like It*, spoken by the melancholy Jaques. The speech compares the world to a stage and life to a play, and catalogues the seven stages of a man's life: infant, school-boy, lover, soldier, justice, pantaloon, and second childhood, "sans teeth, sans eyes, sans taste, sans everything". Shakespeare means that the world is nothing but a theatrical stage where we humans are actors. From our birth we enter the stage and keep on acting true to our age, until old age when we act the last scene. It is one of Shakespeare's most frequently-quoted passages. The full passage is:

*All the world's a stage,
And all the men and women merely players;
They have their exits and their entrances;
And one man in his time plays many parts,
His acts being seven ages. At first **the infant**,
Mewling and puking in the nurse's arms;
Then the whining **school-boy**, with his satchel
And shining morning face, creeping like snail
Unwillingly to school. And then **the lover**,
Sighing like furnace, with a woeful ballad
Made to his mistress' eyebrow. Then **a soldier**,
Full of strange oaths, and bearded like the pard,
Jealous in honour, sudden and quick in quarrel,
Seeking the bubble reputation*

*Even in the cannon's mouth. And then **the justice**,
In fair round belly with good capon lin'd,
With eyes severe and beard of formal cut,
Full of wise saws and modern instances;
And so he plays his part. The sixth age shifts
Into the lean and slipper'd **pantaloon**,
With spectacles on nose and pouch on side;
His youthful hose, well sav'd, a world too wide
For his shrunk shank; and his big manly voice,
Turning again toward childish treble, pipes
And whistles in his sound. Last scene of all,
That ends this strange eventful history,
Is **second childishness** and mere oblivion;
Sans teeth, sans eyes, sans taste, sans
everything."*

Infancy

0-1 year

Childhood

1-12 years

The Lover

12-18 years

The Soldier

18-25 years

The Justice

25-65 years

Preconception

Prenatal

Lactating mother

Menopause

The Pantaloon 65-?

Second childhood ?-?

The Infant: In this stage he is dependent on others and needs to be constantly attended to.



**The School boy -
Childhood:** It is in this stage that he begins to go to school. He is reluctant to leave the protected environment of his home as he is still not confident enough to exercise his own discretion.



The Lover: In this stage, comparable to modern day adolescence, he is always remorseful due to some reason or other, especially the loss of love. He tries to express feelings through song or some other cultural activity.

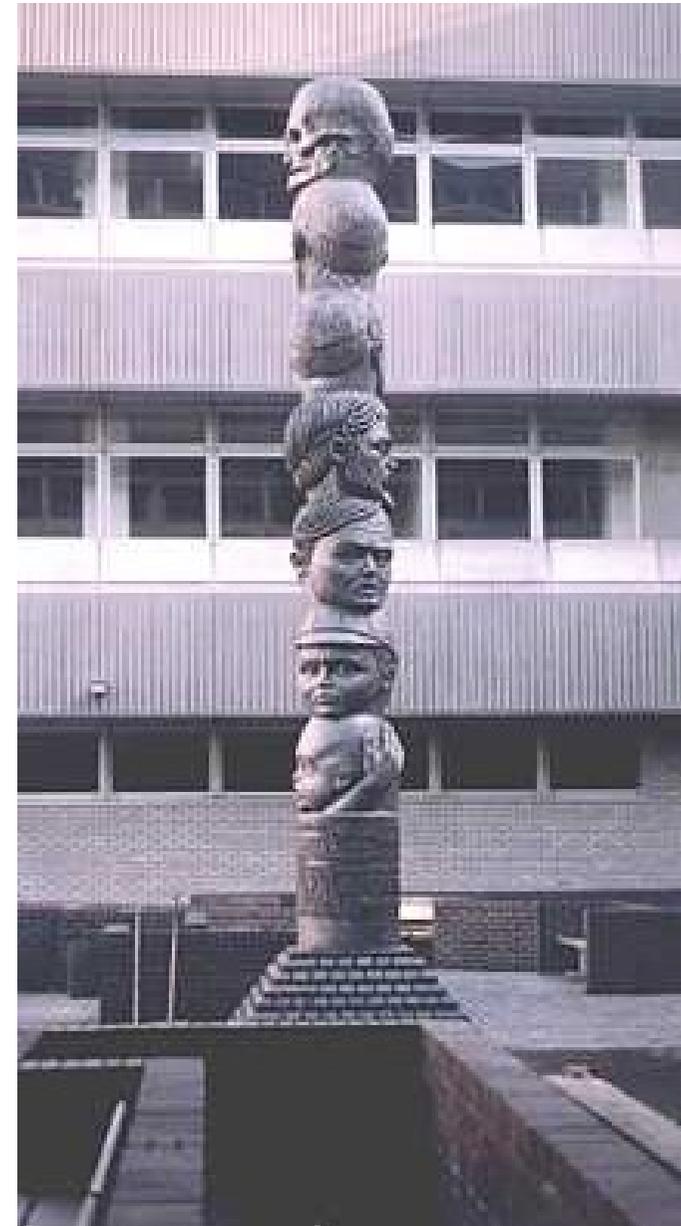
The Soldier: comparable to modern day young adult, that he thinks less of himself and begins to think more of others. He is very easily aroused and is hot headed. He is always working towards making a reputation for himself and gaining recognition, however short lived it may be, even at the cost of his own life.

The Justice: In this stage, comparable to modern day adult, he has acquired wisdom through the many experiences he has had in life. He has reached a stage where he has gained prosperity and social status. He becomes very attentive of his looks and begins to enjoy the finer things of life.

The Pantaloon - Old age: He begins to lose his charm — both physical and mental. He begins to become the brunt of others' jokes. He loses his firmness and assertiveness, and shrinks in stature and personality.

Second Childhood - Mental dementia and death: He loses his status and he becomes a non-entity. He becomes dependent on others like a child and is in need of constant support before finally dying.

**The Seven ages of
Man** from
Shakespeare's *As
You Like It*.
Commissioned by
British Telecom and
placed near the
Mermaid Theatre,
London.



Infancy

0-1 year

Nutritional requirements for infants and toddlers

Recommended Dietary Allowances by Age

Age	Calcium mg/day	Magnesium mg/day	Phosphorus mg/day	Iron mg/day	Vit D IU/day	Vit K mcg/day
0-6 months	400	40	300	6	300	5
6 to 12 months	600	60	500	10	400	10
1 to 3 years	800	80	800	10	400	15

Sleepy baby

A newborn baby that is excessively sleepy and poor at latching on and feeding can be born to mother's prescribed drugs through the labour, especially Pethedin.

Pethedin passes through the cord into the baby through the labour.

Check for chemical toxicity and prescribe **NAC to mother and baby.**

Colic



1. Colic is caused by spasm of the smooth muscle of the intestines and causes a great deal of distress to the baby.

Colic can be caused by imbalance in the calcium / magnesium ratio in the baby.

Johnson, JD; Cocker, K; Chang, E (1 October 2015). "Infantile Colic: Recognition and Treatment". *American Family Physician*. 92 (7): 577–82. PMID 26447441. Archived from the original on 26 August 2017. Retrieved 22 July 2017.

A high level of calcium compared to magnesium is passed to the baby through the milk of a mother drinking large quantities of hard water either in hard water areas or mineral water with a high calcium to magnesium ratio.

Shamir, Raanan; St James-Roberts, Ian; Di Lorenzo, Carlo; Burns, Alan J.; Thapar, Nikhil; Indrio, Flavia; Riezzo, Giuseppe; Raimondi, Francesco; Di Mauro, Antonio (2013-12-01). "Infant crying, colic, and gastrointestinal discomfort in early childhood: a review of the evidence and most plausible mechanisms". *Journal of Pediatric Gastroenterology and Nutrition*. 57 Suppl 1:

2. Potassium deficiency causes the contractions of the intestinal muscles to slow, without which the food cannot be digested and absorbed properly, resulting in diarrhoea or constipation. Test for Potassium and Pantothenic acid or CoA factors.

Shamir, Raanan; St James-Roberts, Ian; Di Lorenzo, Carlo; Burns, Alan J.; Thapar, Nikhil; Indrio, Flavia; Riezzo, Giuseppe; Raimondi, Francesco; Di Mauro, Antonio (2013-12-01). "Infant crying, colic, and gastrointestinal discomfort in early childhood: a review of the evidence and most plausible mechanisms". *Journal of Pediatric Gastroenterology and Nutrition*. 57 Suppl 1:

3. Intestinal movements also slow down when the diet becomes deficient in protein, or some of the B vitamins, particularly B1, B5. Undigested food may stay in the intestines for hours or days, stagnating and creating stagnant gas.

Providing the missing nutrients usually increases the motility and relieves the symptoms.

Liquid Vitamins and Mineral supplements work best with children

Shamir, Raanan; St James-Roberts, Ian; Di Lorenzo, Carlo; Burns, Alan J.; Thapar, Nikhil; Indrio, Flavia; Riezzo, Giuseppe; Raimondi, Francesco; Di Mauro, Antonio (2013-12-01). "Infant crying, colic, and gastrointestinal discomfort in early childhood: a review of the evidence and most plausible mechanisms". *Journal of Pediatric Gastroenterology and Nutrition*. 57 Suppl 1:

4. Check for probiotics. Babies gut is usually inoculated during birth itself and in cases of caesarean birth this may not happen. Also if the mother or baby has been prescribed antibiotics, the normal flora and fauna of the gut may be killed off.

Xu, Man; Wang, Jiao; Wang, Ning; Sun, Fei; Wang, Lin; Liu, Xiao-Hong (1 January 2015). "The Efficacy and Safety of the Probiotic Bacterium *Lactobacillus reuteri* DSM 17938 for Infantile Colic: A Meta-Analysis of Randomized Controlled Trials". *PLoS One*. 10(10): e0141445.

**Predominant
probiotics in
infancy**

**Lactobacillus
brevis**

**Bifidobacterium
breve**

**Bifidobacterium
infantis**

**Bifidobacterium
longus**



**5. Check baby
for tolerance to
mothers milk.**

**Milk may contain
contaminants
through the diet
or mobilisation
of mothers fat.**

*Karp, Harvey (2003). **The Happiest Baby on the Block: The New Way to Calm Crying and Help***

Your Baby Sleep Longer. New York: Bantam.



6. Check for **allergy to foods** **mother** is eating which are passing into the milk i.e. wheat, or cows milk proteins.

Remove allergen from mothers diet.

Roberts, DM; Ostapchuk, M; O'Brien, JG (Aug 15, 2004). "Infantile colic". American Family Physician (Review). 70 (4): 735–40.

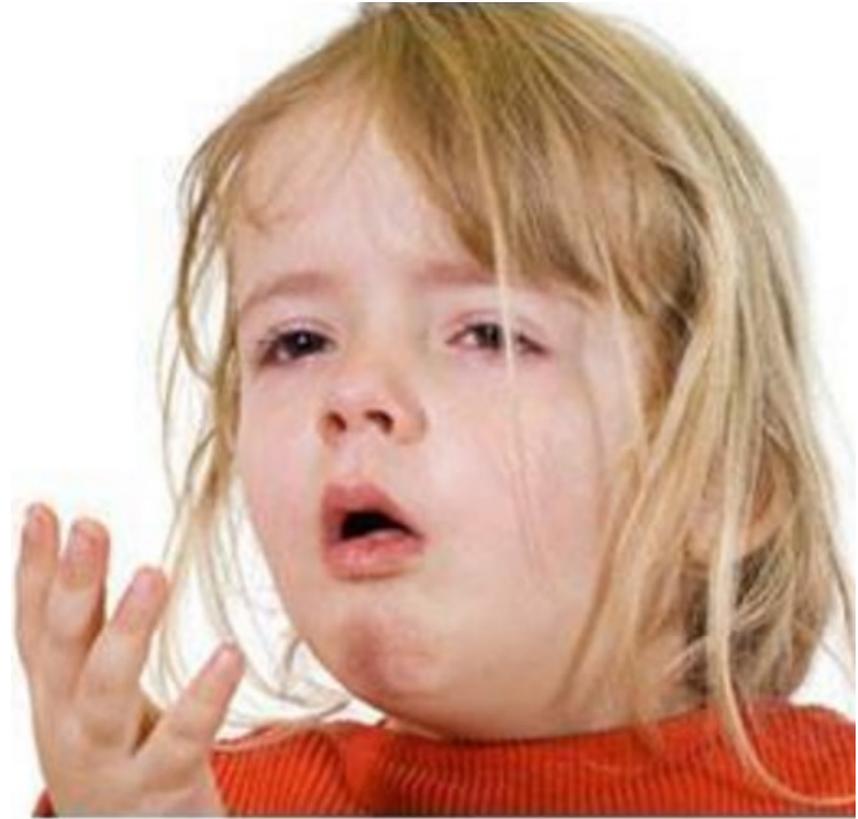


seleneriverpress 

**7. Check child
for infection. i.e.
bacteria, virus,
fungus or
parasite and
treat accordingly.**

*Karp, Harvey (2003). **The Happiest Baby
on the Block: The New Way to Calm
Crying and Help Your Baby Sleep***

Longer. New York: Bantam.



Childhood

1-13 years

**Nutrition from
infancy through to
Childhood (1-13
years)**



- 1. During this time nutrition plays a critical role in promoting optimal growth and development, strengthening the immune system and enhancing social and cognitive ability**
- 2. During the first years of life the infant's weight should triple, and length should increase by 50%.**

"Children's Health: MedlinePlus". nih.gov.

3. By the time a child is 5 the brain will have reached 90% of its adult weight.

4. Major requirements for toddlers age 1-3 years.

"Children's Health: MedlinePlus". nih.gov.

The major requirements for toddlers from one year to three

Calories:	about 1300
Protein:	16 grams
Vitamin A:	400ug RE
Vitamin C:	40 mg
Thiamin:	0.7 mg
Riboflavin:	0.8 mg
Niacin:	9 mg
Vitamin B6:	1.0 mg
Folate:	50 ug
Calcium:	800mg

**Specific Nutrient Deficiencies to
Test for in infants and children**

1. Calcium, Phosphorus and Vitamin D. Very low Calcium can contribute to rickets in infants and children. Only generally occurs on very restrictive diets.

UNICEF, The State of the World's Children 1998: Fact Sheet. <http://www.unicef.org/sowc98/fs03.htm>

Maintain adequate Calcium
during childhood is necessary for
the development of a maximal
peak bone mass.

**This decreases the incidence of
osteoporosis later on in life.**

UNICEF, The State of the World's Children 1998: Fact
Sheet. <http://www.unicef.org/sowc98/fs03.htm>

Vitamin D may need to be supplemented alongside Calcium for a maximal response.

Bioavailability of Calcium from human milk is greater than formula feed.

UNICEF, The State of the World's Children 1998: Fact Sheet. <http://www.unicef.org/sowc98/fs03.htm>

2. Iron Deficiency especially in breast fed babies whose mothers are iron deficient.

3. Vitamin K. There is postnatal decline of Vitamin K dependent coagulation factors. Lack of Vitamin K occurs in Hemorrhagic disease of the newborn.

UNICEF, The State of the World's Children 1998: Fact Sheet. <http://www.unicef.org/sowc98/fs03.htm>

4. Essential fatty acids

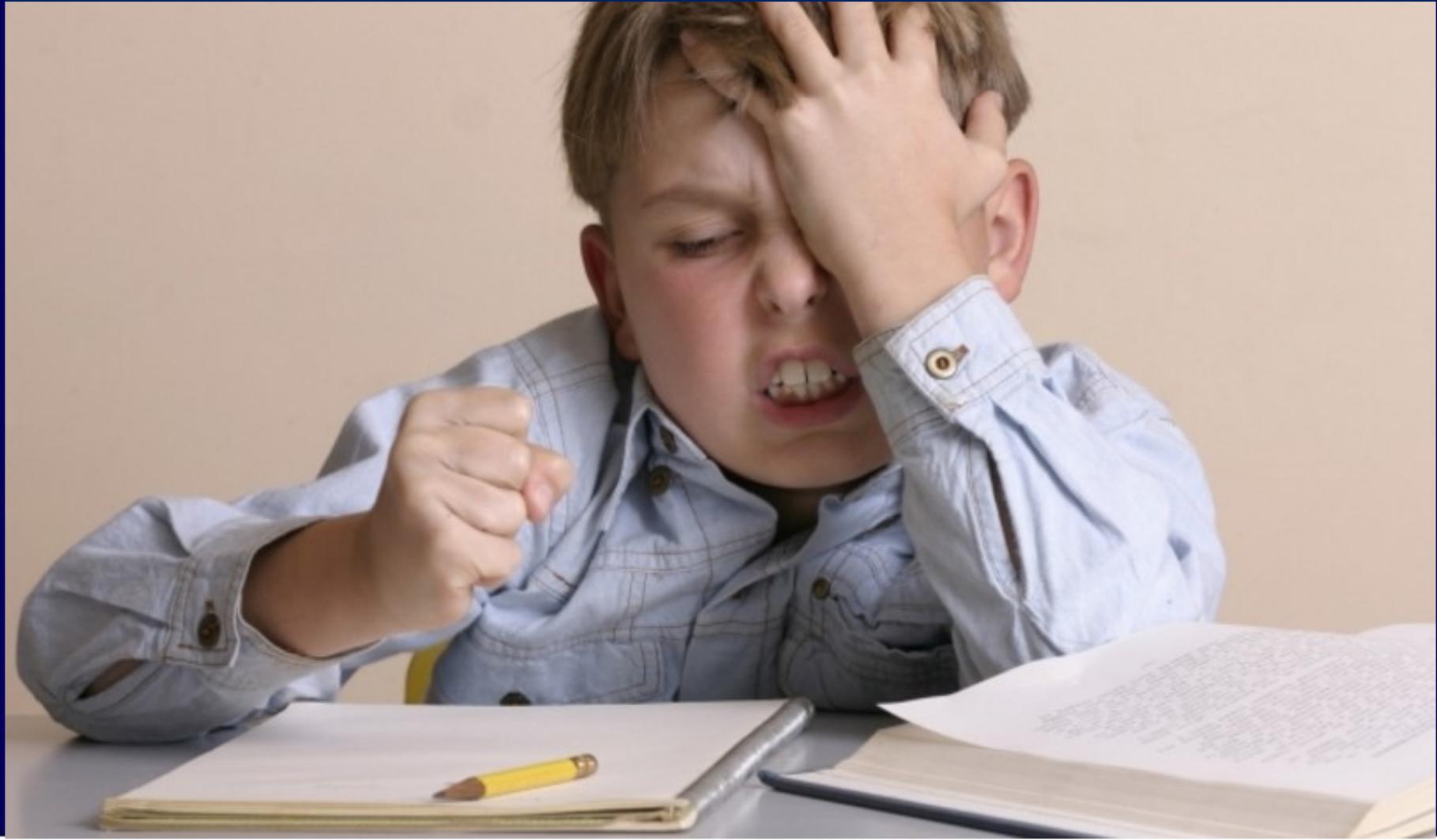
DHA is essential for proper development of the brain and retina in the infant

5. Zinc for growth and repair and appetite (children who won't eat).

6. Folic acid (stunted growth test epiphyseal plate of knee)

**Conditions necessitating extra
nutritional intervention**

Attention Deficit Hyperactivity Disorder in children



This is the most common behavioural disorder in children Characterised by attention deficit, impulsivity and sometimes over activity (hyperactivity), mood swings, temper tantrums, disorganisation, inability to cope with stress or stay focussed.

Center for Food Safety and Applied Nutrition (30 March 2011). Background Document for the Food Advisory Committee: Certified Color Additives in Food and Possible Association with Attention Deficit Hyperactivity Disorder in Children.(PDF) (Report). Food and Drug Administration.

**It begins in
childhood and
can last into
adulthood**



Causative factors include, genetic factors, adverse responses to food additives, intolerances to foods, sensitivities to environmental chemicals, moulds and fungi and exposures to neurodevelopmental toxins such as heavy metals and organo-chlorine pollutants

Chapman, Sarah (March 2011). Guidelines on approaches to the replacement of Tartrazine, Allura Red, Ponceau 4R, Quinoline Yellow, Sunset Yellow and Carmoisine in food and beverages.(PDF) (Report). Aberdeen: Food Standards Agency in Scotland.

Thyroid dysfunction also common.

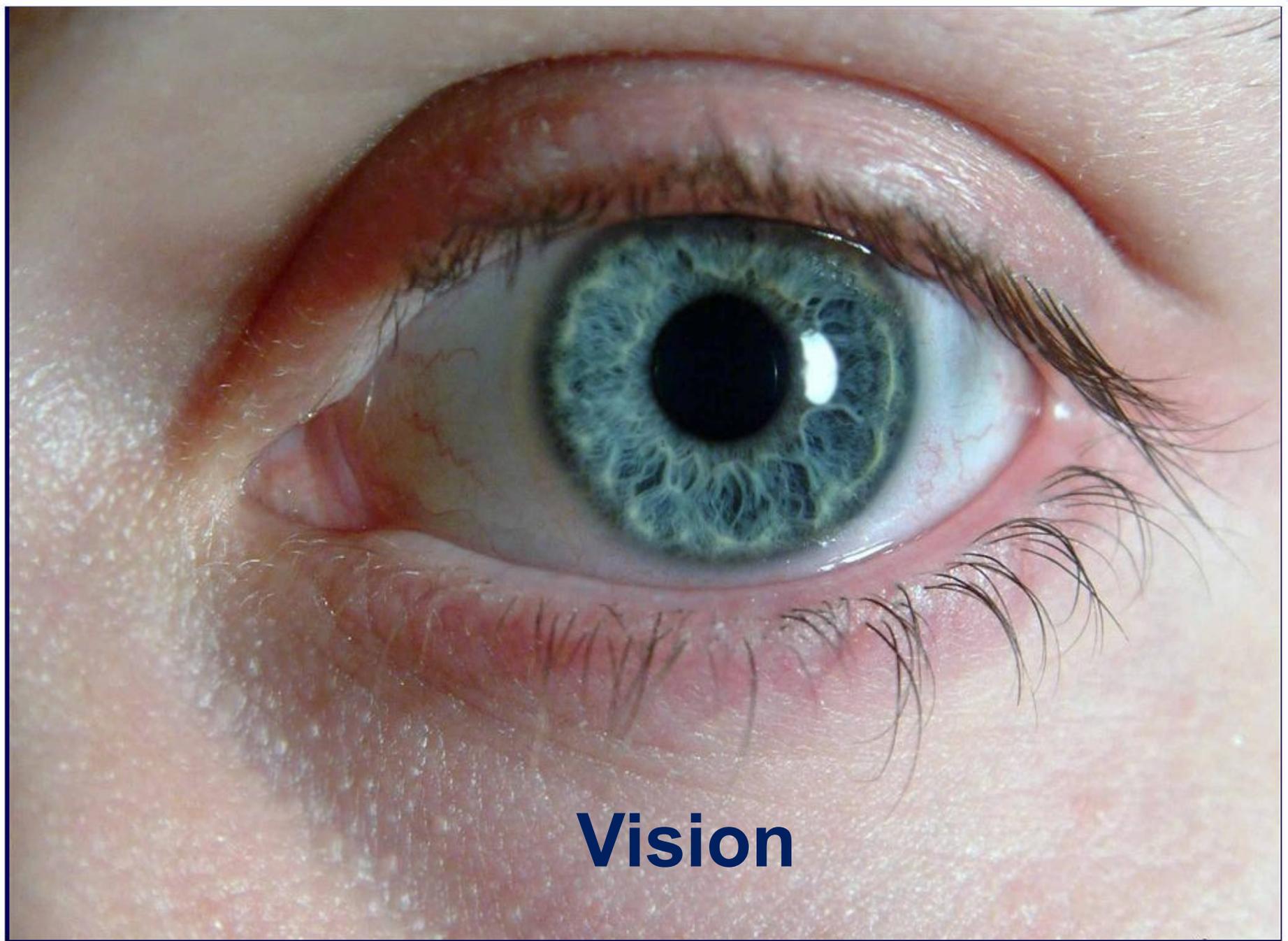
Nutrient deficiencies are common, particularly P5P, Magnesium, Zinc, Omega 3 / DHA fatty acids, Bioflavonoids and the essential Phospholipids.

Young, G; Conquer, J (January 2005). "Omega-3 fatty acids and neuropsychiatric disorders". *Reproduction, Nutrition, Development*. 45 (1): 1–28.

**Treat with relevant
supplementation, dietary
modification, detoxification,
correction of intestinal dysbiosis,
Cranial and Emotional work.**

Challenging the 5 senses





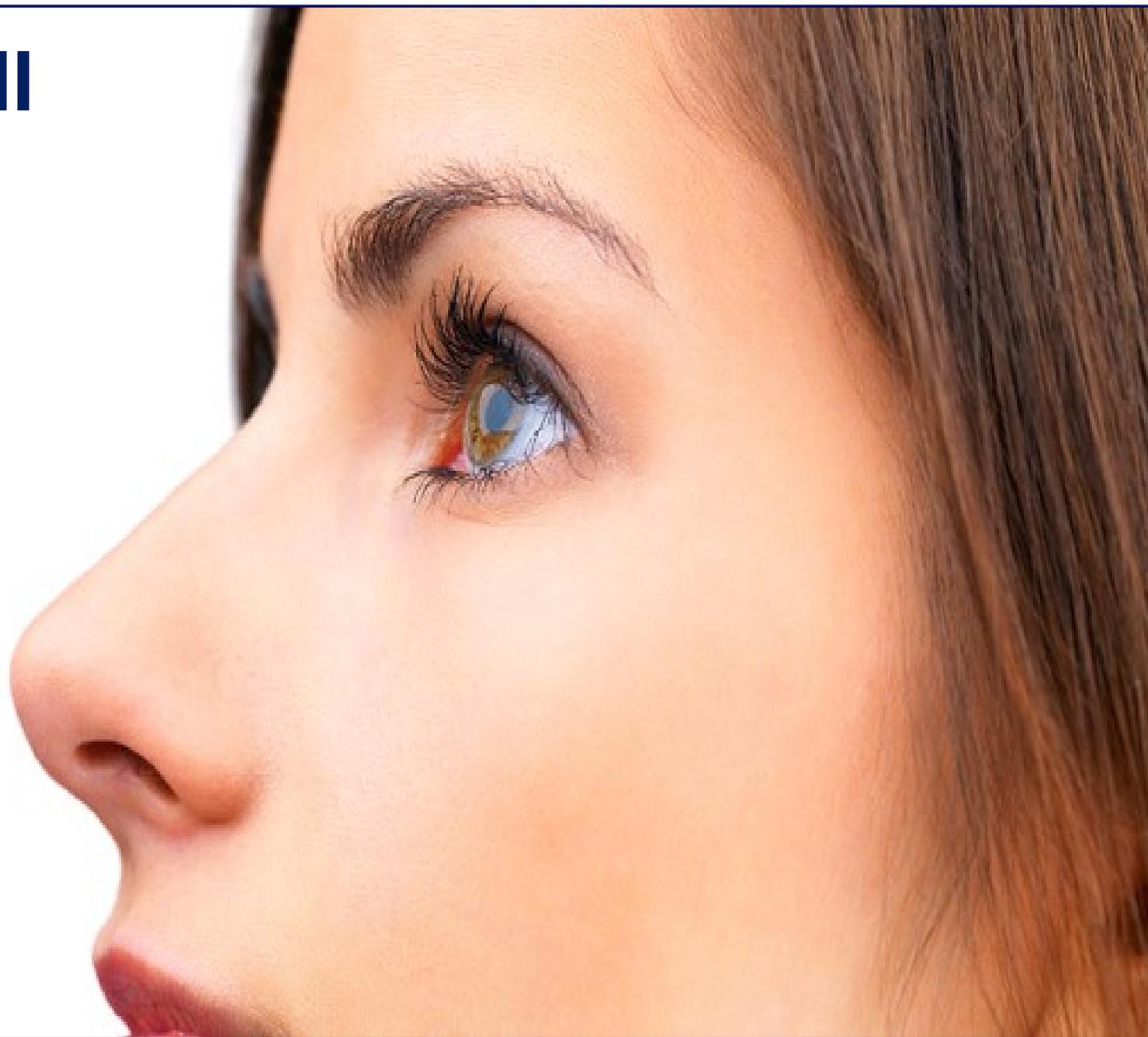
Vision



Hearing



Smell





Taste

selenriverpress 

UMAMI

Cystathione

**Argino
succinate**

Glutamic acid

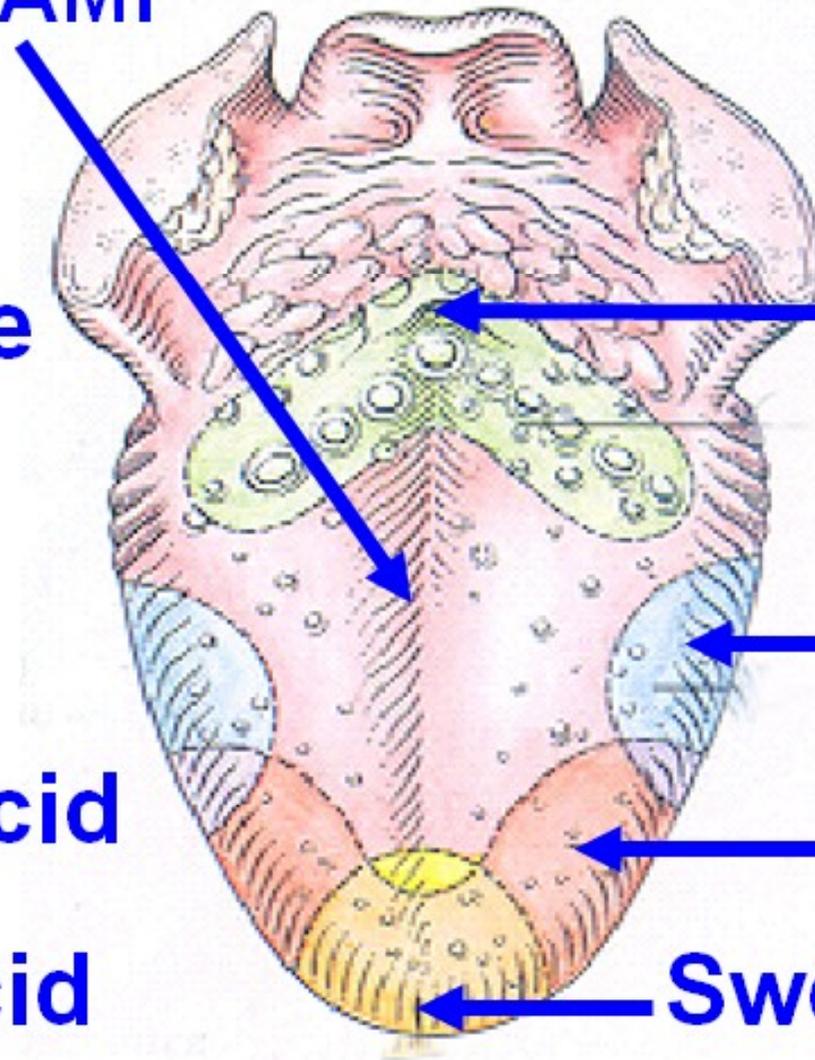
Aspartic acid

Bitter

Sour

Salt

Sweet



**The Lover
Teenagers
13-18 years**

Teenagers



Menstrual period dysfunctions

Dysmenorrhea

**Low progesterone or High
estrogens**

P-5-P

Zinc

Evening primrose oil

Magnesium (for uterine cramps)

Heavy periods (menorrhagia)

**Usually a vascular collagen
weakness**

Iron

P-5-P

Collagen

**Vitamin C complex (for
bioflavonoids)**

Nutrition in early teens (13-18years)

1. Adolescence is a period of intense physical, psychological and cognitive development.

Macmillan Dictionary for Students Macmillan, Pan Ltd. (1981), page 14, 456.
Retrieved 2010-7-15.

2. Puberty, age 10-12 for girls and 12-14 for boys is an intense growth period increasing height and weight. Protein, calorie and nutrient requirements increase.



3. The body mass doubles and nutritional demands increase.



4. At puberty the skeleton is only half its adult mass and bone is constantly being formed and reabsorbed, hence the importance of Calcium. 99% of total body calcium is found in the skeleton. 50% of serum calcium is ionised. Calcium absorption is passive, Vit D independent or active Vit D dependent.

Marshal, W. (1978). Puberty. In F. Falkner & J.Tanner (Eds.), *Human growth*, Vol. 2. New York: Plenum.

Recommended intake of **1200-1500 mg/day** achieve optimal peak bone mass.

The efficiency of calcium absorption is increased in puberty and the majority of bone formation occurs during this period. Probably due to higher anabolic steroid levels.

Marshal, W. (1978). Puberty. In F. Falkner & J. Tanner (Eds.), *Human growth*, Vol. 2. New York: Plenum

Preoccupation of girls with being thin and hence cutting down on all milk products decreases dietary intake. Also teenagers that drink massive amounts of cola containing large amounts of phosphorus may be deficient as the Phosphorus displaces Calcium.

Goldstein, B. (1976). Introduction to human sexuality. Belmont, CA: Star.

5. Rapid growth of body mass and rise in haemoglobin concentration require more iron.

6. Omega 3 oils

7. Nutritional requirements

increase when teenage diets can become very poor, either through fast foods, convenience foods or diets especially in girls.

Ge, Xiaojia; Natsuaki, Misaki N.; Neiderhiser, Jenae M.; Reiss, David (2007). "Genetic and Environmental Influences on Pubertal Timing: Results From Two National Sibling Studies". *Journal of Research on Adolescence*. 17 (4): 767–788.

Nutritional Requirements at Puberty in Females



1. Bone Calcium reaches a maximum in females shortly before menarch.

At that time bone deposition rate is 5x that of adult.

There is a decline in bone Ca deposition rate after menarch.

2. Increased nutrients are required by the **pituitary, ovaries and adrenal glands.**

3. Omega 3 and / or EPO improves dysmenorrhea in adolescents when taken for more than 3 months

Exam Support Formula

High Omega 3 intake for at least 3 months prior to exams.

1 week before exam onset aerobic exercise 1-2 X per day 15 minutes each.

3 days before exams and during exam period care with diet.

No refined sugars.

Protein, usually boiled egg and fruit and whole-wheat toast for breakfast.

Fruit juice and handful of nuts and raisins mid morning .

Protein and whole-wheat bread and 1 pint water for lunch, handful nuts and raisins mid afternoon and nutritious evening meal.

Before exam morning or afternoon, cycle, walk or run to school. (stimulates acetylcholine)

The Soldier
18-25 years

Essential nutrients to support the modern soldier

Multiple Vitamin and Mineral

Omega 3

NAC for the boozy nights

Zinc

Optimal eating

a) eat to the level of comfort

b) incorporate the 6 tastes

Sweet – sugar, honey, milk

Salt – salt

Sour – lemon, yogurt, vinegar

Bitter – Lemon rind, bitter

green, turmeric, fenugreek

Pungent – onions, garlic,

ginger, radishes

Astringent – beans, lentils

Recommended Daily Allowances

In 1941 RDA's were developed with the goal of reducing the incidence of nutritional deficiency diseases within the general population, such as scurvy, pellagra and beriberi.

Alexander Shawtz

They were intended

- 1. As guidelines for the prevention of nutritional deficiencies.**
- 2. To be related to the nutrient status of population groups, not individuals.**

Alexander Shawtz

Since **at least 1951** critics of the RDA's have asserted that the RDA's lack the ability to recommend levels of nutrients sufficient to maintain health for a person seeking a healthy life span that is associated with a morbidity free existence.

Alexander Shawtz

Studies that have been used to determine the level of a nutrient that is sufficient to prevent a nutritional deficiency is typically conducted for **only 6-9 months, about 1% of the average person's lifetime. This suggests that the minimalist dietary standards are based -**

Alexander Shawtz

On data incapable of suggesting levels of nutrients essential to prevent many conditions and diseases associated with morbidity.

The 10th edition of the RDA's in 1989 recommends higher levels for smokers, heavy alcohol users and dieters.

Alexander Shawtz

Recommended Optimal Nutrient Intakes

Cheraskin and Ringsdorf investigated the health of 13,500 subjects through an evaluation of each person's health status. Each subject in the study completed the following test or procedure -

- 1. The 195 item Cornell Medical Index Health Questionnaire.**
- 2. Physical and anthropometric measurements.**
- 3. Dental examination.**
- 4. Eye examination.**
- 5. Cardiac tests including ECG.**
- 6. Glucose tolerance test**
- 7. Panel of 50 blood chemistries.**
- 8. Study of each patient's diet.**

The hypothesis of the study concluded that relatively symptomless and disease free individuals are healthier than those with clinical symptoms and signs and that this difference was due to the intake of nutrients from the diet and / or dietary supplementation.

Alexander Shawtz

**RDA's and optimal nutritional
intake levels.**

Details in Laminate

The Justice
25-65 years

Thinking about starting a family

Even just thinking about getting pregnant

Multiple Vitamin / Mineral

Folates

P-5-P

DHA

Choline

NO VITAMIN A (use carotenoids)

A woman with brown hair, wearing a light blue short-sleeved shirt, is shown from the chest up. She is holding a black pen in her right hand and a white folder or document in her left hand. The folder has the text "Epigenetics Products" written on it in purple, slanted font. The background is plain white. The entire image is framed by a dark blue border.

Preconception Nutrition

Epigenetics Products

Good nutrition is essential to prepare the woman's body for pregnancy to enable her to provide adequate nutrients for the developing baby.

Begin lifestyle changes / supplementation **3 months to 1 year before conception.**

Zinc deficiency can cause miscarriage, foetal growth retardation, stillbirth and congenital handicap. An important component of collagen it is necessary to promote the health and elasticity of the skin and connective tissue to safeguard against premature rupture of the membranes.

Calcium. Inadequate intake of calcium by the mother results in Calcium being taken from the mothers bones, increasing the risk of osteoporosis of the mother.

Use most ionizable form of calcium such as lactate or citrate.

Folic Acid. It is very sensitive and easily destroyed by light and cooking so usually need to supplement.

Folic acid is used with B12 to produce DNA and RNA.

RDA folic acid = 400 mcg/day to prevent neural tube defects.

Including spinabifida and anencephaly. Folic acid is used with B12 to produce DNA and RNA. All nutrients involved in the degradation of homocysteine, including Folate, P-5-P and B12 have a relation to negative pregnancy outcomes, probably related to their impact on methylation.

Increased homocysteine levels implicated in neural tube defects, spontaneous abortion and placental abruption. Also in pre-term delivery and low birth weight.



The foetus, the neonate and the pregnant woman all have increased requirement for **folate and vitamin B12** and are more likely to suffer deficiencies of these vitamins.

Derangement of methionine to **homocysteine** metabolism could be the underlying mechanism of neural tube defects and may be the mechanism of prevention observed with folic acid supplementation.



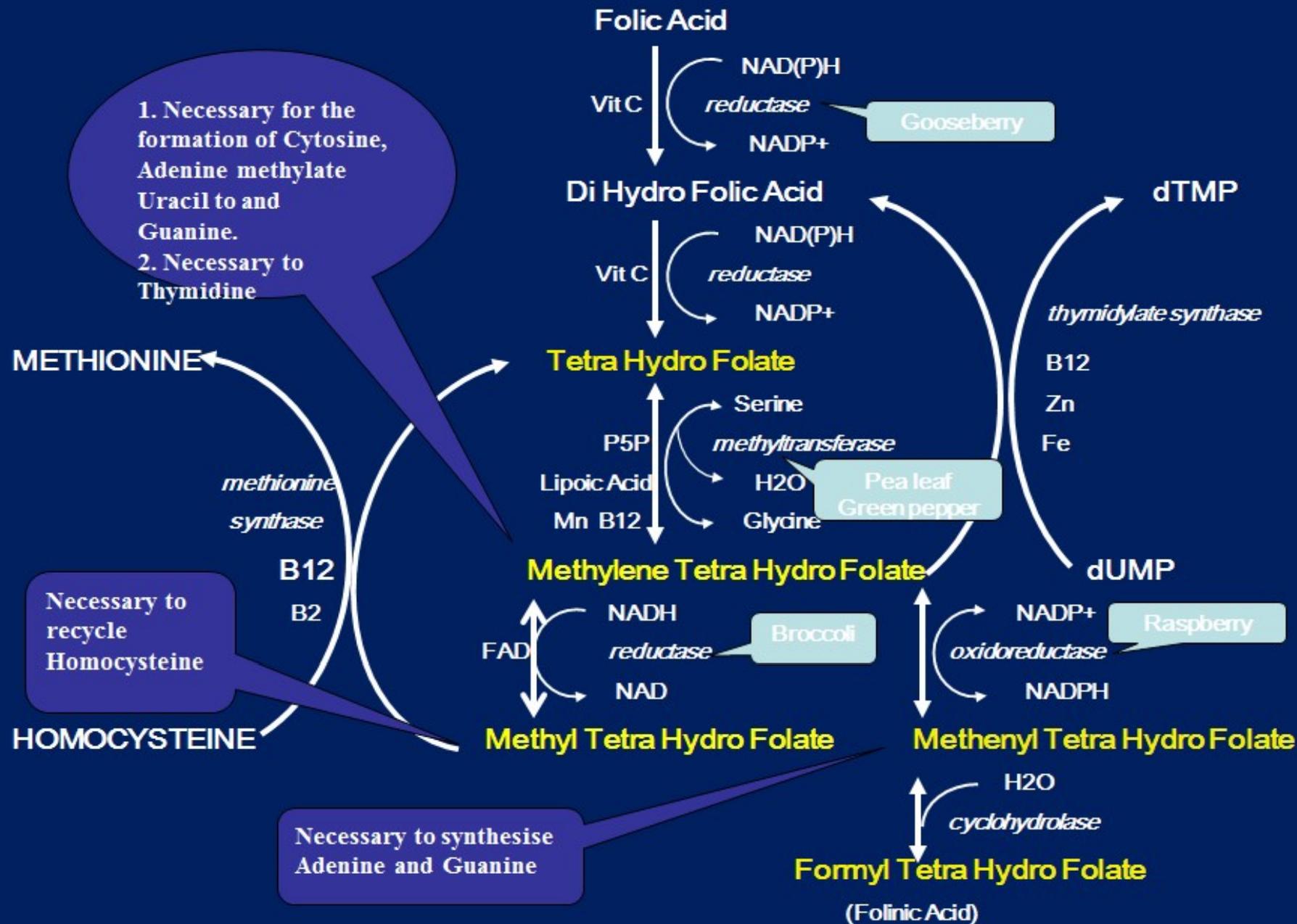
Derangement of methionone – homocysteine metabolism is found in 20% of cases with neural tube defects, recurrent miscarriage and placental abruption.

Homocysteine itself may be toxic to the embryo or may be an indicator of reduced availability of SAM for methylation of DNA.

A gene has been identified responsible for the increased incidence of **NTD**. The gene is 3x more prevalent in women with NTD infants. It regulates the activity of methyl H4 Folate reductase, the enzyme responsible for converting methylene H4 Folate to **5-Methyl H4 Folate** -

- the form of folic acid involved in the remethylation of homocysteine to methionine. These women may have adequate dietary intakes of folates but improper conversion needed for **homocysteine disposition.**

Patients with the genetic polymorphism where there is congenital deficiency of the **enzyme Methylene tetrahydrofolate reductase**, which is needed for the formation of 5MTHF have reduced levels of methionine and SAM in the CSF and show demyelination in the brain and degeneration of the spinal cord.





Methylene tetrahydrofolate is the active form of folate to prevent neural tube defects

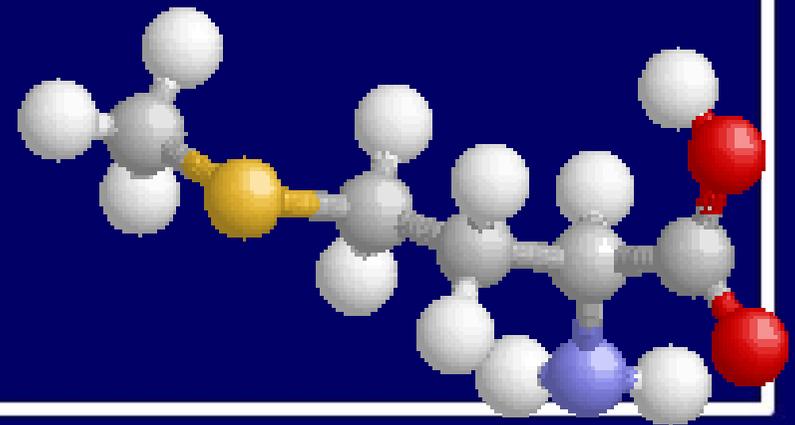
Folinic acid (Methenyl H4 folate)

is more stable than folic acid and has a longer half life in the body. Folinic acid also readily crosses the blood brain barrier and is slowly cleared, compared to folic acid which is poorly transported into the brain and once in the CNS is rapidly cleared.

Vitamin B12. Low plasma levels of B12 have been shown to increase risk of NTD.

Methylcobalamine **is needed in** the remethylation of homocysteine. Decreased **adenosylcobalamine** results in increased amounts of methylmalonyl CoA and general increase in glycine levels.

Methionine. Adequate methionine seems to exert a protective effect if there is folic acid deficiency. Lack of folic acid and methionine can result in foetal underdevelopment.



Phosphatidylcholine acts as a precursor to acetylcholine and choline.

The availability of choline and its metabolites is critical for optimal brain and nerve development and function.

Choline is also involved in the regeneration of methionine from homocysteine.

Taurine - Optimise dietary levels of protein and the nutrients required for its synthesise from cysteine and methionine (B6). There is virtually no taurine in plants and vegetables so supplementation may be necessary pre-conceptually.

During neonatal period total body levels and brain **taurine reach a peak.**

Deficiency can be associated with mental retardation.

CoQ10 - Plasma CoQ10 levels rise throughout pregnancy from week 18 and reach a high of about 50% above normal levels by week 36. Studies show that women with threatened abortion and spontaneous abortion have lower levels of CoQ10 than those with normal pregnancies.

Vitamin A has been shown to be teratogenic in pregnancy especially when taken in the first 2 months of pregnancy. The liver tetra hydro folate regulates liver folate metabolism and is suppressed in cases of high Vit A.

There is a higher incidence of birth defects in cases of high Vitamin A intake.

Beta carotene, the precursor to Vitamin A is not teratogenic.

Mercury Toxicity



Advise against mercury filling removal during pregnancy and ensure complete removal at least **3 months prior to conception**
Mercury vapour is highly lipid soluble and enters from the oral mucosa.

Mercury traverses cell membranes including the blood brain barrier and the **placental barrier. It is also found in **breast milk**.**

Mercury concentrations have been found in the kidney, liver, GI tract, jaw and choroids plexus in the brain.

Also found in all, areas of the brain involved in **memory function** (the medullary basal nucleus, amygdala and hippocampus). It can also be taken up by the retina of the eye and alter colour perception.

Starting with Mum



Prenatal Nutrition

Choline

Folates

Vitamin B12

Iron

DHA

Vitamin D3

Multiple Vitamin / Mineral

Infertility – inability to conceive after 1 year of intercourse without contraception

25% of couples will experience infertility

1/3 = male factors

1/3 = female factors

1/3 = combined factors

Infertility increases with age

Factors that reduce fertility in Males and Females

- **Alcohol**
- **Caffeine - up to 300mg caffeine per day can reduce fertility by 27%. Caffeine also impedes the bodies ability to absorb iron and calcium**
- **Artificial Sweeteners**



**No hope if you
drink alcohol,
smoke,**

**drink coffee
and take
artificial
sweeteners!**



- **Cigarettes-contributes to atresia**

(The degeneration of those ovarian follicles which do not ovulate during the menstrual cycle.)

in females and decreased sperm production in males.

- **Recreational Drugs.**
- **Some prescription drugs.**
- **Herbicides and Pesticides.**
- **Mobile phones.**

The Sunday Times 27/6/04

Mobile phones can cut a man's fertility by a third

RESEARCH into the fertility of men who regularly carry and use mobile phones has suggested their sperm count can be cut by up to 30%, reducing chances of conception.

The study is the first to indicate male fertility may be damaged by the radiation emitted by mobiles. Men who carry the phone in a belt holster or trouser pocket are thought to be at the highest risk and could one day be advised to put the

mobile in a bag or briefcase and away from vulnerable areas.

Details of the research will be released on Tuesday at an international scientific conference of fertility experts in Berlin. The researchers studied 221 men for 13 months comparing the sperm of those who used their phones heavily with others who did not.

They found that heavy users of mobile phones, those who carried their phone around

with them most of the time, had their sperm counts reduced by nearly 30%. Many of the sperm that did survive showed abnormal movements further reducing fertility.

While the research suggests an effect on the sperm, the scientists say further work will need to be done to confirm the finding and establish the mechanism by which it might happen.

In the paper, Dr Imre Fejes of the obstetrics and gynaecology

Jonathan Leake
Science Editor

department at the University of Szeged in Hungary concludes: "The prolonged use of cell phones may have a negative effect on spermatogenesis [sperm production] and male fertility, that deteriorates both concentration and motility."

Unlike previous studies, the researchers believe that phones

may cause damage while in stand-by mode. Although not in use, they make regular transmissions to maintain contact with the nearest radio masts. It had been assumed such transmissions were too short to cause harm.

In the study, the researchers looked at men using mobile phones operating on a single frequency. In Britain the picture is more complex with a range of technologies and frequencies in

use. Experts believe, however, that if biological or health effects were to emerge, they would probably be found across the spectrum.

The findings will be presented at the European Society of Human Reproduction and Embryology's annual conference.

Lawrence Chailis, emeritus professor of physics at Nottingham University, who chairs the government's Mobile Tele-

communications and Health Research Group, said that although there were many studies into the health effects of mobile phones, the results were too contradictory to draw firm conclusions.

"There is no conclusive evidence of damage to health, but mobile phones have only been around for about 15 years," he said. "Many serious diseases take much longer than that to

Continued on page 2

Female Infertility

- **Poor diet and nutrition**
- **Endometriosis**
- **XS athletic activity**
- **Too little or too much weight**
- **Past surgery and scarring**
- **Infections especially sexually transmitted diseases**
- **Atkins diet**

Poor diet and nutrition

**B3, B5, B12, Folic Acid, Mg
metabolise cholesterol which is a
precursor to hormones.**

**Nutrients for pituitary function i.e.
EFA, Vit A, C, E, Zn, Mg, Mn.**

**Oral contraceptives decrease Zn
levels if taken over long periods.**

Too much athletic activity

- Results in Amenorrhea, not enough hormone produced for ovulation
- No cholesterol precursor



Endometriosis

- **Check patient for toxin involvement and removal contributing to the endometriosis.**
- **16 Hydroxyestrone –
Methylating nutrients – Mg, Zn,
P5P, B12, Folate, Betaine, DMG,
Iodine.**

Too much or too little weight

- **12% infertility due to weight problems.**
- **If underweight there is not enough fatty acids and essential nutrients to make hormones- need to supplement with Omega 3 and Prenatal nutrients.**

- **If overweight**, often has associated hypoglycaemia and hypoadrenia –adrenal hormones interfere with conception
- Check out **thyroid** function. Main cause is Iodine or Selenium deficiency.

Cholesterol

Pregnenalone

Progesterone

Aldosterone

DHEA

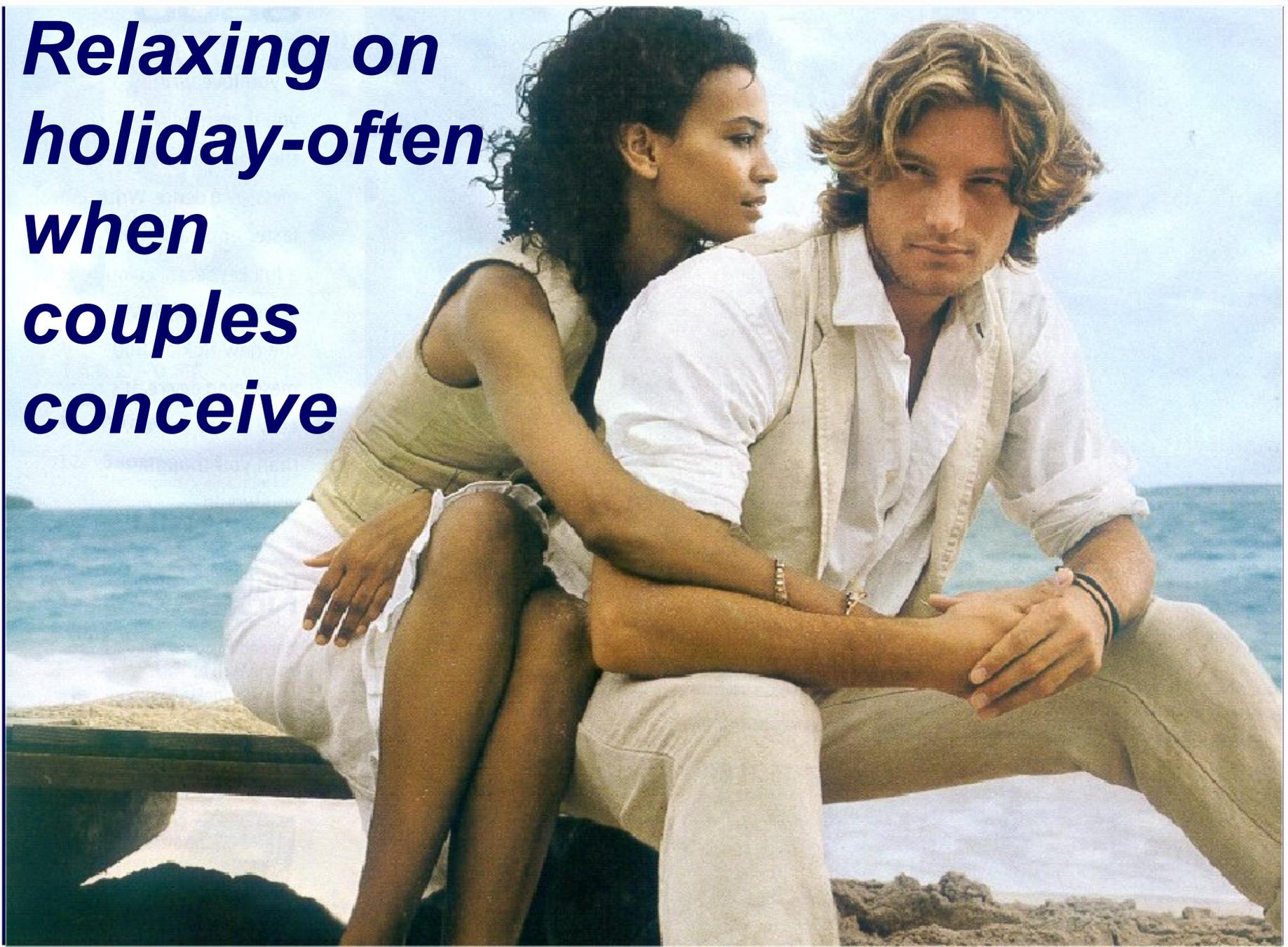
Androstenedione

Testosterone

Estradiol
Estrone
Estriol

Cortisol

***Relaxing on
holiday-often
when
couples
conceive***



Past Surgery and Scarring

**Past uterine or ovarian surgery
with resultant scarring preventing
implantation.**

Test for Vit C

Magnesium

Vitamin E

Silica



Infections

Test for parasites,
especially toxoplasmosis.
(Usually responds well to
Black walnut), and treat
with relevant antiparasitic.

i.e. Wormwood, Cloves, Black
walnut, Artemesia annua.



Test for Bacteria and treat with relevant antibacterial i.e. Vitamin D3, Colloidal silver, Goldenseal etc

Test for virus ant treat with relevant antiviral i.e. Vitamin D3, Colloidal silver, Echinacea, Selenium.

Test for Toxic Metals and Radiation and chelate with
Ornithine, Phospholipid,
Vitamin C

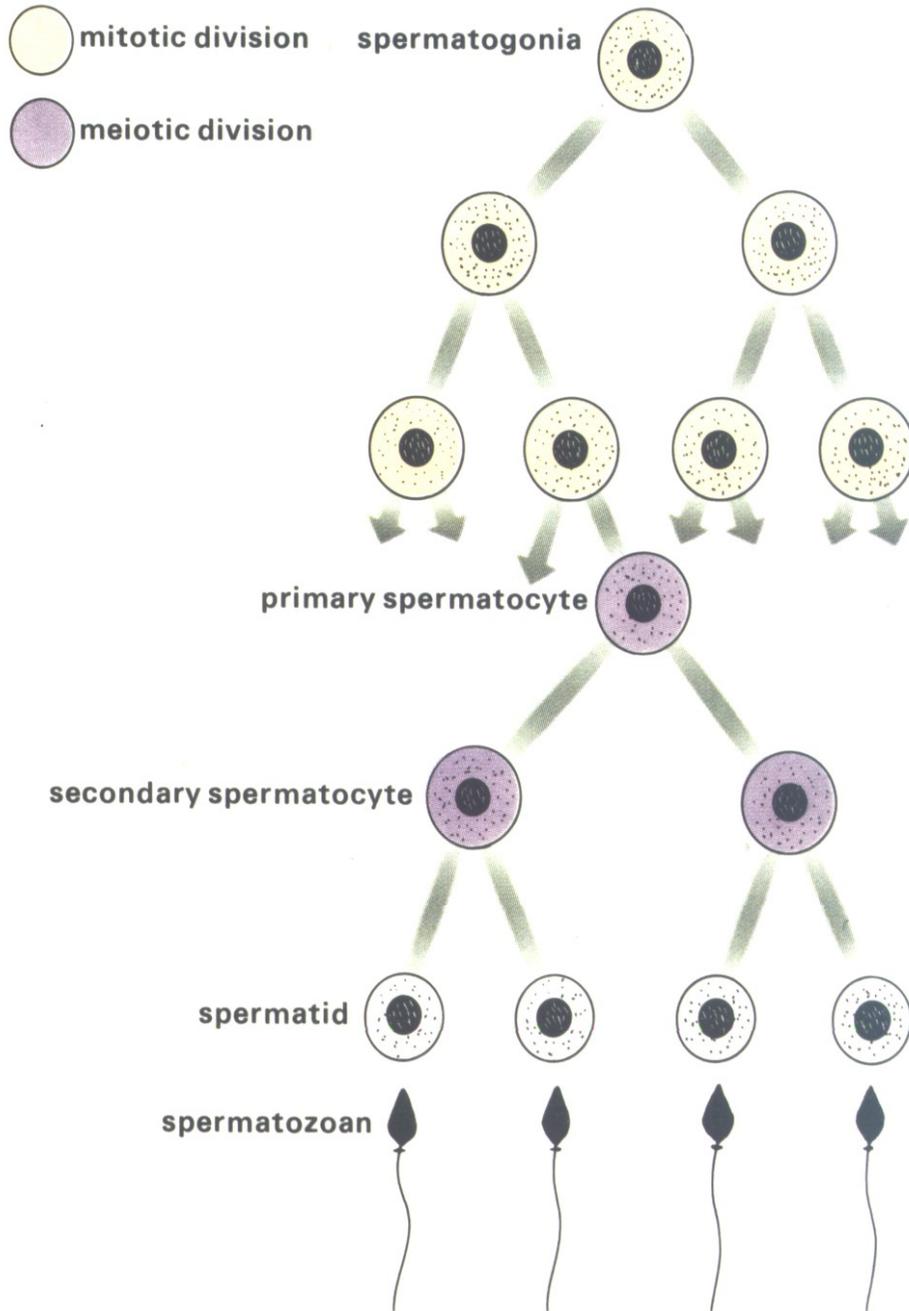
Test for chemicals and treat with
chemical chelator i.e.
Glutathione, NAC, Taurine,
Vitamin C, Yarrow, Lemon balm

Allow at least 3 months in female infertility to attain a normal level of hormones for conception.

Male Infertility

**Sperm
production
requires
Vit A, C, E, Folic
acid and Zinc
in conjunction
with
testosterone**





Sperm production

Nutrient content of sperm includes Ca, Mg, Zn, Inositol and B12

Deficiency of Vit E causes degeneration of testicles.

It also acts as an antioxidant and has been shown to inhibit free radical damage to sensitive cell membranes.

It improves sperm mobility and enhances the ability of the sperm to penetrate the egg.

Vit E combined with Selenium
supplementation shows the most significant increase in sperm motility.

Deficiency of B12. If an aging stomach lining fails to produce enough intrinsic factor a B12 deficiency results causing anaemia. Eventually can cause infertility in males and females.

In one study, infertility caused by pernicious anaemia was reversed by Vit B12 administration.

In another study 375 men with low sperm counts were given **methylcobalamin**, more than half responded with increased sperm production.

B12 is important in cellular replication, especially for the synthesis of DNA and RNA.

Deficiency of Zinc results in immovable, useless sperm and low sperm count. Zn is needed by the testes, seminal vesicles and prostate. Zn levels in the seminal vesicles is directly related to the sperm motility. The sperm are too weak to penetrate the egg.

Dietary Zinc restriction reduces both sperm count and seminal plasma volume.

Zinc supplementation increases plasma testosterone.

Each ejaculation corresponds to loss of 1mg Zn.

Zinc is a good indicator of fertility.

The Zinc concentration in semen corresponds to the number of sperm in fertile men.

In rats Manganese deficiency causes loss of semen.

Deficiency of Selenium also shown to cause infertility.

Hereford Texas – The Town Without A Toothache

Dr. Heard, a dentist in Hereford, Texas, back in the 1940s, is possibly responsible for the beginning of the myth that fluoride prevents tooth decay. Later he rejected that notion, arguing that it was not just the fluoride but all the other nutrients and minerals especially manganese in the diet in Deaf Smith County, Texas.

Co Q 10 is concentrated in the mitochondria and is involved in the energy production of the sperm.

Also acts as an antioxidant, preventing lipid peroxidation of sperm cell membranes.

Vitamin C helps with sperm agglutination problems.

Antibodies to sperm create this agglutination and Vitamin C decreases agglutination.

Vitamin C also shown to reduce sperm abnormalities and increase viability, motility, maturity and total sperm count.

Vitamin C also helps protect sperm over free radical damage. In one study 30 infertile but otherwise healthy men were given 1gm Vitamin C and all their wives became pregnant compared to another control group given a placebo, none of which became pregnant.

Antioxidants-Polyunsaturated fatty acids and phospholipids are key constituents in the sperm cell membrane and highly susceptible to oxidative damage.

Sperm produce controlled concentrations of ROS, such as superoxide, H₂O₂ and NO which are needed for fertilization.

However large concentrations of these free radicals can directly damage sperm cells.

**Deficiency of some amino acids
reduces sperm count.**

L- Arginine is important for sperm mobility as it is a precursor in the synthesis of polyamines and as a precursor to nitric oxide.

The polyamines putrescine and spermidine are organic components important to sperm movement.

Nitric Oxide within spermatozoa also appears to be necessary for adequate sperm mobility.

Pathospermia (abnormal sperm) can be caused by abnormal Arginine metabolism.

L- Arginine is also a testosterone precursor.

L-Carnitine contributes directly to sperm mobility and may be involved in the successful maturation of sperm. The main function of carnitine in the epididymus is to provide an energetic substrate for sperm.

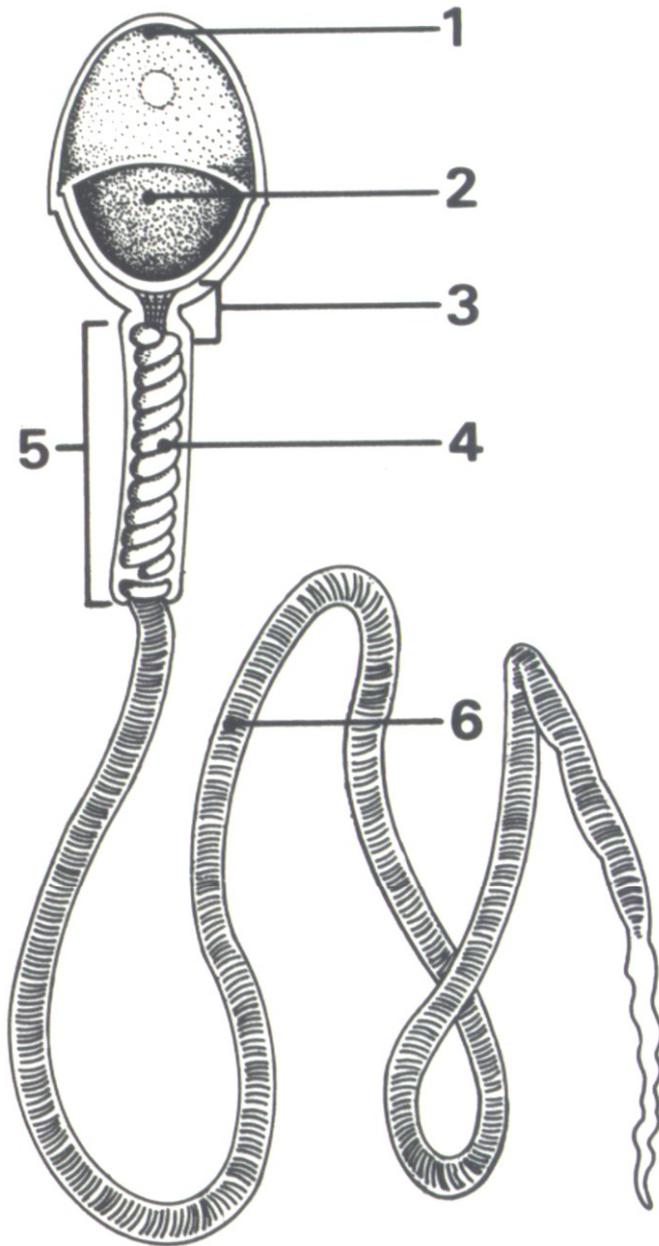
Important because epididymal sperm use **fatty acid metabolism** as their main source of energy metabolism and tend to concentrate **carnitine** while it is in the epididymis, as **carnitine** is necessary for transport of fatty acids into the mitochondria.

Low levels of **carnitine** reduce fatty acid concentrations within the mitochondria, leading to decreased energy production and potential alterations in **sperm motility**.

Glutathione is vital to sperm antioxidant defences and increases sperm motility. Selenium and glutathione are essential to the formation of phospholipid hydroperoxide glutathione peroxidase, an enzyme present in spermatids.

It becomes a structural protein comprising over 50% of the mitochondrial capsule in the mid piece of the mature sperm.

Deficiency of either **glutathione or **selenium** can lead to instability of the mid piece, resulting in defective motility.**



- 1. Head**
- 2. Neck**
- 3. Joins 4 to the body 5**
- 4. Mitochondria**
- 5. Body**
- 6. Tail**

Declining sperm counts linked with the action of **xenoestrogens found particularly in organochlorine pesticides. Found particularly in male foetuses when mother was exposed to high levels of organochlorine pesticides over long periods.**

Exogenous estrogens inhibit the development of Sertoli cells, which determine the lifelong capacity for sperm production.

Danish study showed **organic farmers** had higher sperm counts than those using pesticides.

Generally there is a declining sperm count.

Sperm count per ml is about half of that in 1940.

Sperm count fall

Sperm counts have dropped by almost a third in a decade, a study of 7,500 men at the Aberdeen Fertility Centre from 1989 to 2002 showed. Siladitya Bhattacharya, the lead researcher, said they could not conclude that male fertility had fallen, because factors other than sperm count played a part.

The Times
5/1/04

Alcohol is a reproductive tract toxin; consumed in a large enough quantity over a long enough period of time can cause infertility.

It is at least partially reversible if males infertile from drinking avoid drinking it for a ***moderate*** period of time.



Smokers show increased cadmium levels in seminal fluid. Cigarette smokers have higher levels of circulating estradiol, and decreased LH, FSH and prolactin, all of which can impact spermatogenesis. Smokers with low prolactin levels demonstrate defects in sperm motility.

Nicotine can alter the hypothalamic-pituitary axis, affecting growth hormone, cortisol, vasopressin and oxytocin release, which then inhibits LH and prolactin.

Smoking has also been shown to result in oxidative damage of DNA.

Damage to **guanine** part of DNA is 50% higher in smokers. The concentration of alpha tocopherol decreases by a third in the seminal plasma of smokers.

Smoking and low antioxidant levels increase **oxidative damage to sperm DNA.**

As with females, test for infections

-

Chlamydia can reside in the epididymis and vas deferens affecting sperm development and fertility.

28-71% of infertile men have evidence of chlamydial infection.



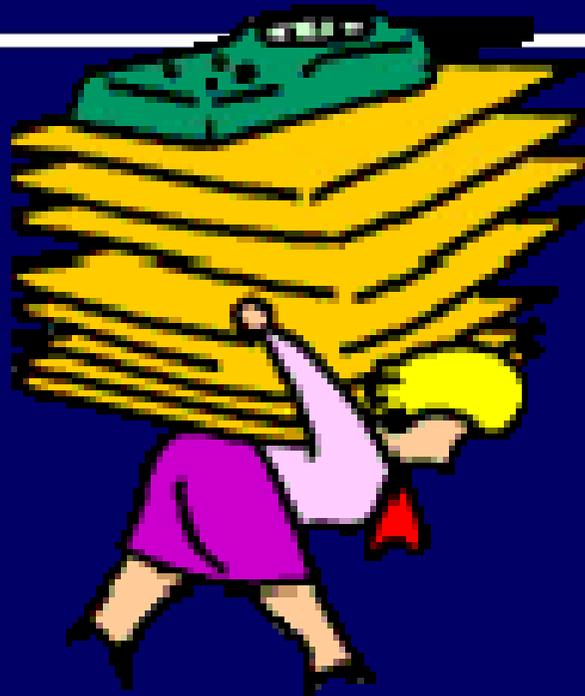
- **Test for heavy metals.**

Lead can cause a significant decrease in male fertility.

Mercury has also been shown to decrease sperm quality and sperm production.

- Recent study shows **mobile phones** can reduce male fertility by one third. Researchers have found that radiation emitted from mobile phone use affects swimming mobility of sperm and sperm count.





Presumably the same applies to **females.**

People tend to keep mobile phones in their pockets.

Allow 3 months for any nutritional supplementation and dietary / lifestyle changes to provide the nutrients necessary to make healthy, viable sperm as spermatogenesis takes 74 days.

Age and fertility

Table 1. Infertility Increases With Age

Percentage of married women who are infertile by age group.

<i>Age Group (years)</i>	<i>Percent Infertile</i>	<i>Percent chance of remaining childless*</i>
20 - 24	7	6
25 - 29	9	9
30 - 34	15	15
35 - 39	22	30
40 - 44	29	64

Adapted from Menken J, Trussell J, Larsen U. Age and infertility. *Science*. 1986;23:1389.

* Historical data based upon the age at which a woman marries.

In the Female

- **Fertility decreases with age, particularly after 35.**
- **Female is born with 1-million+ eggs. At puberty 300,000 eggs left.**
- **300 will be ovulated during entire reproductive period of life, the rest undergo atresia (degeneration).**

**Table 2. Risk of Chromosomal Abnormality in Newborns
by Maternal Age**

<i>Maternal Age (years)</i>	<i>Risk for Down Syndrome</i>	<i>Total Risk for Chromosomal Abnormalities</i>
20	1/1,667	1/526
25	1/1,250	1/476
30	1/952	1/385
35	1/378	1/192
40	1/106	1/66
41	1/82	1/53
42	1/63	1/42
43	1/49	1/33
44	1/38	1/26
45	1/30	1/21
46	1/23	1/16
47	1/18	1/13
48	1/14	1/10
49	1/11	1/8

Source: *Maternal Fetal Medicine: Practice and Principles*. Creasy and Resnick, eds.
W.B. Saunders, Philadelphia, PA. 1994:71. Reproduced with permission.

**Degeneration of
eggs**

Smoking accelerates atresia and facilitates early menopause. Eggs in ovaries also age increasing possibility of genetic abnormalities. e.g. Downs syndrome.

Also when
eggs from
older women
are fertilised
the embryos
are less likely
to develop.



Women over 40 are at increased
risk of miscarriage.

Table 3. Risk of Miscarriage (Spontaneous Abortion) with Increased Age

<i>Maternal Age (years)</i>	<i>Spontaneous Abortion (%)</i>
15-19	10
20-24	10
25-29	10
30-34	12
35-39	18
40-44	34
≥45	53

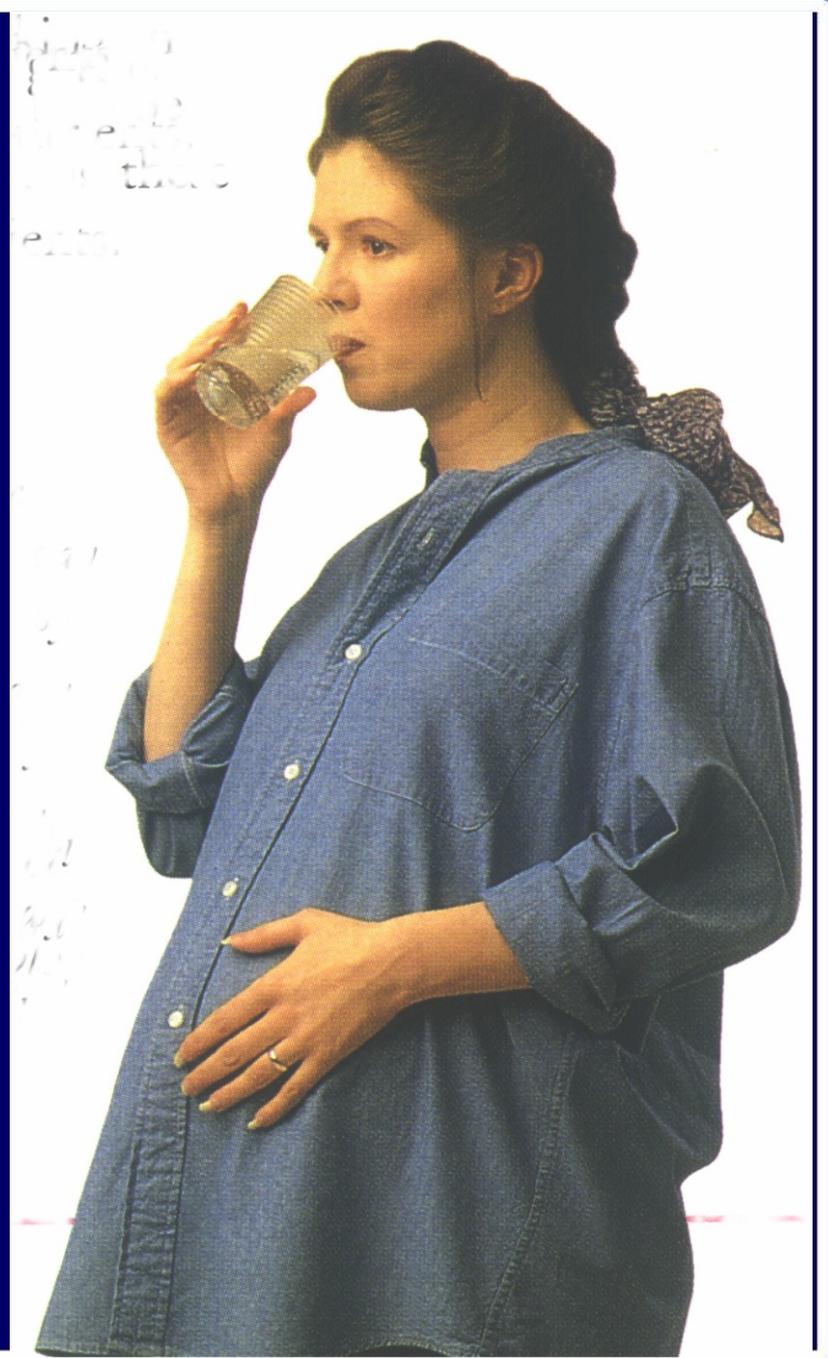
Adapted from P.R. Gindoff and R. Jewelewicz. Reproductive potential in the older woman. *Fertility and Sterility*, 46:989;1986.

In the Male

No maximum age that a male can father a child e.g. Charlie Chaplin at 82 years.



Nutrition During Pregnancy



Recomended Daily Allowances

Female RDA (by age)	15-18	19-24	25-50	51+	Pregnant
Calories	2200	2200	2200	1900	+300
Protein	44	46	50	50	60
Vitamin E	8	8	8	8	10
Vitamin K	55	60	65	65	65
Vitamin C	60	60	60	60	70
Thiamin	1.1	1.1	1.1	1.0	1.5
Riboflavin	1.3	1.3	1.3	1.2	1.6
Niacin	15	15	15	13	17
Vitamin B6	1.5	1.6	1.6	1.6	2.2
Folate	180	180	180	180	400
Vitamin B12	2.0	2.0	2.0	2.0	2.2
Iron	15	15	15	10	30
Zinc	12	12	12	12	15
Selenium	50	55	55	55	65

Deficiency

- **Multiple ways nutritional deficiency can occur**

- a) Primary intake deficiency**

b) Secondary embryonic and foetal nutritional deficiencies caused by

Genetics

Maternal disease

Toxic Insults

Physiological stressors

triggering acute maternal response

All these can be significant contributors to the occurrence of birth defects

Improving the nutritional status of the mother can reduce frequency and severity of pregnancy complications.

- **50% human conceptions are lost before or during implantation.**
- **15-20% of implanted pregnancies are lost before delivery.**
- **3% of completed pregnancies result in a child with 1 or more congenital defects-causative factors can be identified for only 60% of these.**

- **Genetic defects 28%**
- **Multi-factorial Inheritance 23%**
- **Uterine factors 3%**
- **Twinning and specific toxicants 3%**

Intrauterine growth retardation (IUGR) is a marker for pregnancy complications

Risk factors for IUGR

- **Smoking**
- **Low maternal calorie intake**
- **Hypertension**
- ***Multiple pregnancies***

**Mechanisms underlying the
development of essential nutrient
deficiencies**

1. Inadequate dietary intake of essential nutrient

2. Adequate dietary intake

**although deficiency still occurs
due to**

- Genetic Factors creating a higher than normal requirement for a nutrient eg Acrodermatitis Enteropathica require a large amount of Zn. Because of a genetic defect in Zn absorption**

Menke's disease where individuals suffer from Cu deficiency due to intracellular trafficking of Cu.

Gene Abnormalities

**e.g. gene polymorphisms
associated with folate metabolism
can increase the risk of genetic
abnormalities**

3. Nutritional interactions can result in conditioned deficiencies eg dietary binding factors, such as fibre and phytate, can form a complex in the gut with essential minerals that limit their absorption. Zn deficiency results in individuals who consume phytate rich foods

4) Mineral to mineral interactions.

If one mineral is involved in the metabolism of another, a deficiency of one may influence the other. Alterations in Fe metabolism are often observed in individuals with Cu deficiency.

Another interaction occurs when elements share a **common transport site or ligand**. Because of their similar physiochemical properties

Zn-Cu react

Fe-Mn react

Cd-Zn react

Zn-Vit A reactions.

These reactions can occur at multiple sites, including the gut, within the blood pool and within the placenta.

Metal-metal interactions can significantly influence the transport of metals into the developing foetus.

Importantly, metal-to-metal interactions can occur between essential and nonessential metals.

e.g. Exposure to high levels of Cadmium can result in secondary Zn deficiency which can be teratogenic.

4. Effect of drugs or chemicals on the metabolism of the nutrient

a) Chelating drugs i.e. Chelation of Cu by D-Penicillamine

Chelation of Zn by EDTA

Both these result in foetal mineral deficiencies.

b) Drugs or chemical nutrients
that influence the metabolism of
a nutrient.

For example a decreased
absorption of some nutrients
results from drug induced
reduction in transit time. Also
diuretics increase the urinary
loss of some nutrients.

5) Acute maternal response to drugs and toxicants, physical stimuli and some diseases metabolising greater amounts of nutrients than normal.

e.g. Increased need for Folic and Ascorbic acid in response to the oxidative damage of smoking.

**Essential
Micronutrient
Deficiencies and
Pregnancy**



Zinc

Severe Zn Deficiency during pregnancy is **teratogenic. Typical malformations associated with severe Zn deficiency include cleft lip and palate, brain and eye malformations, and numerous abnormalities of the heart lung and urino-genital systems.**

Biochemical and functional abnormalities can occur as a result of Zn deficiency. In animal models even transitory deficiencies (5-6 days) in Zn can be teratogenic and preconception Zn deficiency can adversely affect embryonic developments can drop in the plasma by more than 50% in 24hrs after Zn deficiency occurs.

The rapid effect on the developing foetus suggest a lack of substantial Zn stores in the embryo and foetus.

Hypo-zincaemia can be a
complication of disease states
including
Diabetes
Hypertension
AIDs
Alcoholism

Physiological changes can exist for weeks or months in the mother due to toxicants including maternal tissue damage.

There are associated inflammatory responses. This stimulates a protein, metallothionein to be produced which binds to Zn.

The function of this protein is to protect against metal toxicity.

There is a resultant

HYPOZINCAEMIA and reduced Zn transport to the foetus.

Long-term ingestion of Zn should be monitored as it can induce secondary Cu deficiency

Placental Zinc

A healthy placenta is the richest known source of Zn, containing between 300-600 mg depending on its size. In the animal kingdom and in some societies the placenta is eaten, valued for its high nutrient content. Eating the placenta immediately restores postpartum Zn levels.

Copper

A deficit of Cu during pregnancy can result in early embryonic death and gross structural abnormalities including skeletal, pulmonary and cardiovascular defects.

Biochemical, neurological and immunological abnormalities can occur.

Human infants with **Menkes syndrome**, an X-linked defect in the copper transporter ATP7A are characterized by hypothermia, neuronal degeneration, and abnormalities in hair, skin and connective tissues, bone fractures and widespread vascular abnormalities.

Iron

Maternal Iron deficiency has been shown to affect cognition, behaviour and motor development.

Selenium

Low blood selenium concentration correlates with increased risk of spontaneous abortion.

Also involved in oxidative defence system, cell signalling and regulation of cell growth.

Selenium is required for sperm motility.

Selenium is involved with the conversion of thyroxin (T4) to T3 intra-cellularly.

Selenium has a role in viral suppression, AIDS and is also implicated in delaying the aging process.

Vitamins

- **Folic Acid** deficiencies and neural tube defects-expand
- **Carotenoids** decrease in response to toxicants including maternal tissue damage.
- **Choline** important in hippocampal connections.

Dr. Williams, in collaboration with Dr. Warren H. Meck, associate professor in the Department of Experimental Psychology, opted to build an improved cholinergic system by adding **choline** to the diet when the cholinergic cells are being formed and making the synaptic connections in the brain.

Cholinergic cells are special because they need choline to make acetylcholine but cholinergic cells, like all cells, also require choline to maintain their cell membranes. So, Dr. Williams supplemented pregnant rats with choline in their drinking water.

This task taps into working and reference memories.

"Amazingly enough, the rats which had pre-natal or post-natal or both pre- and post-natal supplementation of choline made fewer mistakes on the first day of training and the choline animals continually perform better than control rats even as adults," said Dr. Williams. In fact, rats which had both **pre- and post-natal supplementation of choline** demonstrated the greatest amount of permanent improvement in their memory capacity and precision.

"Since those experiments were completed, the sensitive periods for choline administration have been determined to be prior to birth on days 12 to 17 in development and also days 15 and 30 after birth," said Dr. Williams.

The former period occurs when all the **cholinergic neurons in the basal forebrain form**. The latter period also seems to be highly significant because it is when these developing rats are being weaned and **synaptic connections are being made in the hippocampus and cortex** that are critical in visuospatial learning and memory.

P-5-P Important to maintain adequate amounts of P5P to keep levels of Homocysteine low- decrease miscarriage etc

Hypervitaminosis A is teratogenic, resulting in craniofacial, limb, neural tube, heart and uro-genital system defects

EFA

Omega 3 and Omega 6 required for optimal growth and development

Omega 3 especially DHA is decreased in pre-term infants.

These babies cannot synthesise DHA from alpha linolenic acid in sufficient amounts to ensure adequate amounts to the brain and retina.

Increased visual acuity and better problem solving ability in infants supplemented with DHA. DHA is essential for the proper development of the brain and retina in the foetus and infant, RBC levels DHA of infants born to mothers supplemented with DHA were 35% higher and blood plasma levels 45% higher.

Omega 3 supplementation has been shown to reduce the levels of **preclampsia along with magnesium**

All Nutrients associated with normal **homocysteine** production and re-methylation as pre-conceptually.

Magnesium

Zinc

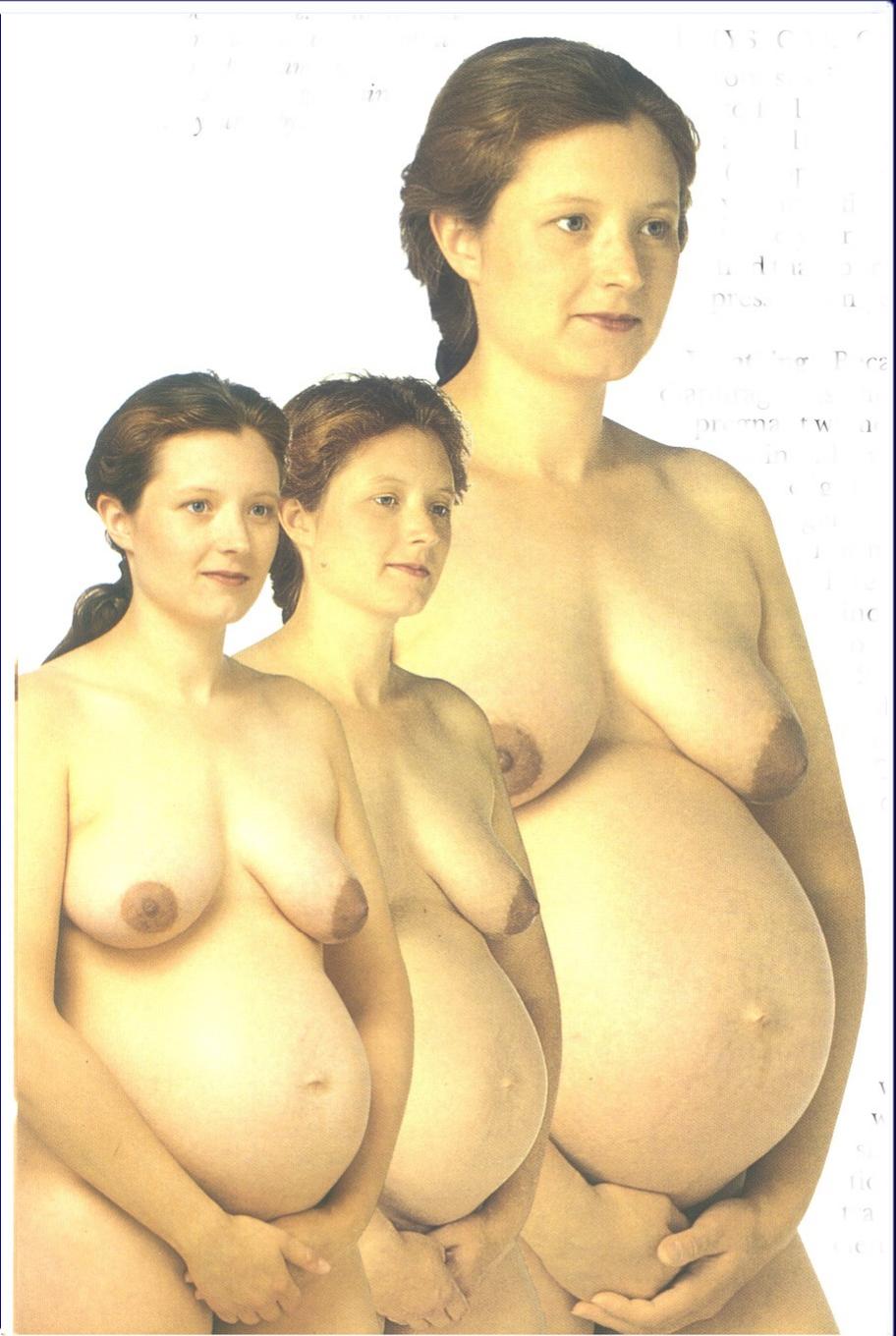
P5P

Methylcobalamin

MethylH4Folate

Betaine

**Genetic
Consequences of
Nutritional
Deficiencies
during
pregnancy**



1. Folic Acid deficiency can lead to neural tube defects

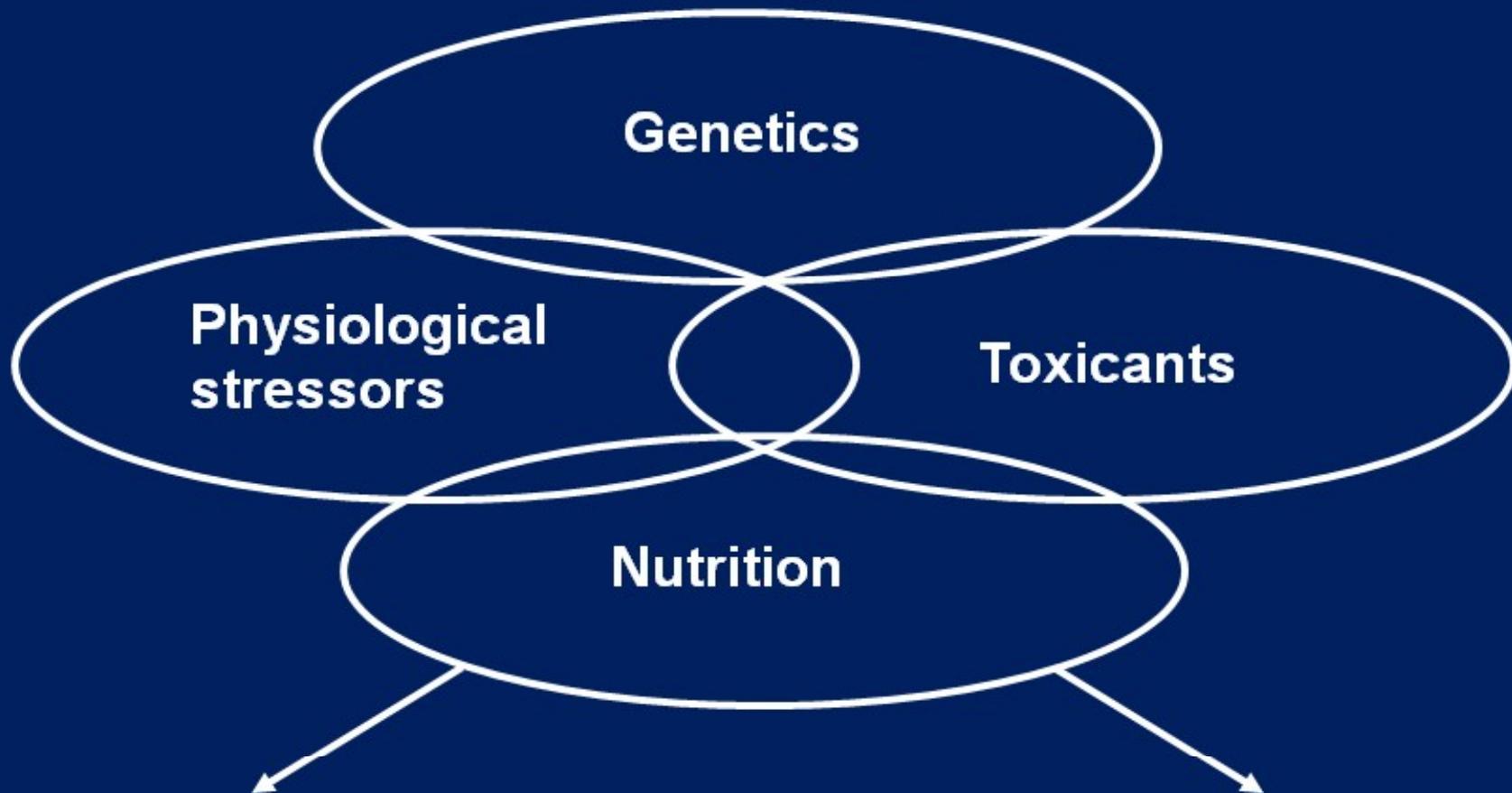
2. Maternal exposure to nutritional insults can have persistent effects on offspring eg decreased Zn can result in persistent effects on immune system function in the offspring even after Zn repletion.

3. Poor Iron intake during early development can result in persistent changes in dopamine metabolism, myelin composition, brain iron concentrations and behavioural disturbances

4. Perinatal Copper deficiency affects Moro reflex despite Copper repletion.

This suggests **maternal nutrition influences** the programming of certain foetal genes. Micronutrient deficiencies significantly effect the intrauterine environment and can influence the risk for certain diseases such as diabetes, hypertension and coronary heart disease.

**Maternal and environmental
interactive effects that can
influence the developing
conceptus**



Maternal health



Fetal outcome

Morning Sickness



**Low stomach acid
(hypochlorhydria)
causes the morning
nausea and
sickness often
associated with
pregnancy**



Morning sickness is not all it seems

By Mark Henderson
and Alexandra Freat

MORNING sickness is not nearly as bad as pregnant women think, according to new research from Canada.

The findings suggest that while up to 80 per cent of pregnant women suffer from sickness, many are nowhere near as ill as they feel: the impact of the nausea depends largely on mental outlook.

That means doctors should make sure that their patients are offered counselling and psychological support as well as anti-emetic drugs, Toronto University scientists say.

Their findings come after research published this year purporting to show that concentration and memory loss during pregnancy and immediately after childbirth, commonly referred to as "cotton wool brain", are also not nearly as bad as women think.

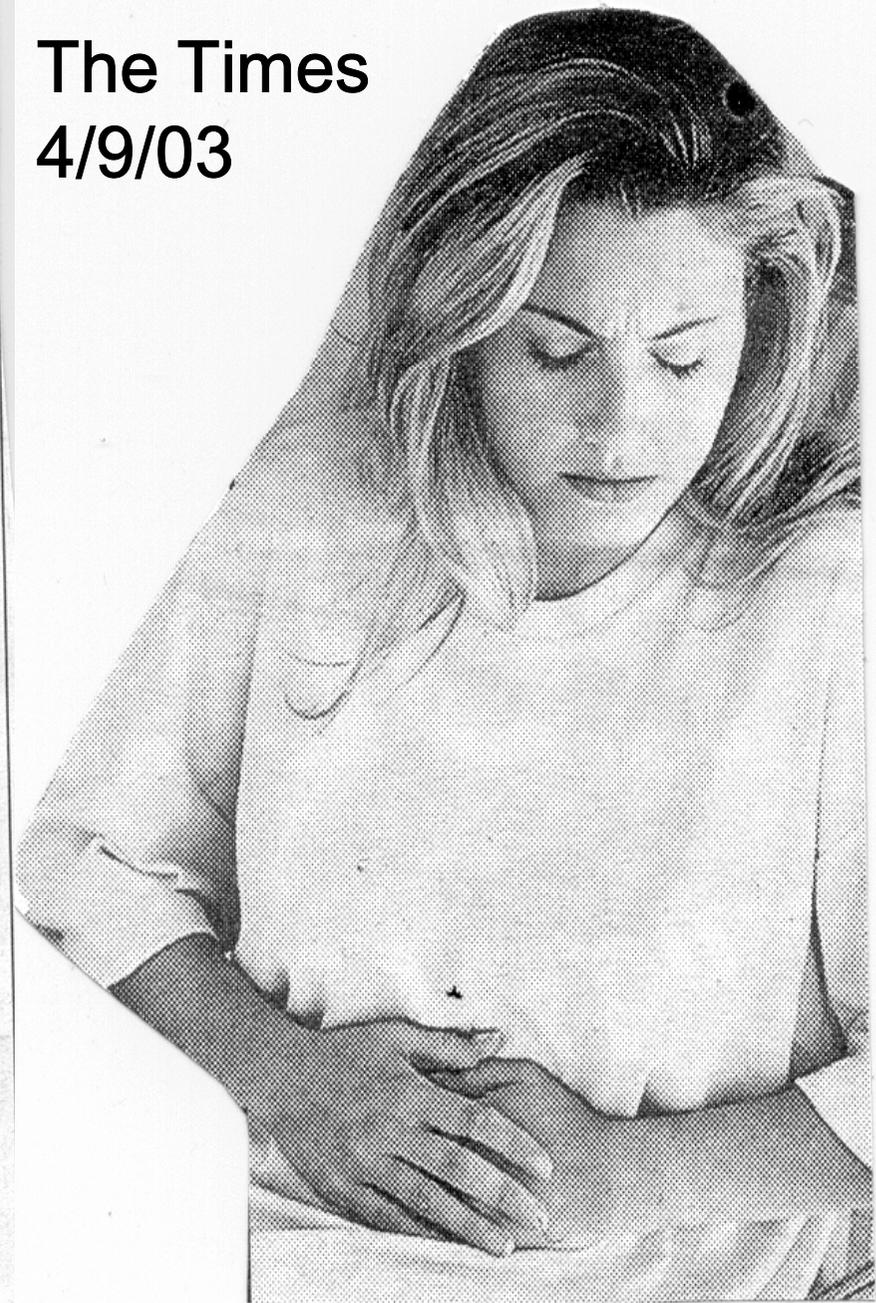
That study, by psychologists from the University of Sunderland, suggested that women's perception of their condition was unduly affected by expectations of what was supposed to happen in pregnancy.

While there is no suggestion that morning sickness is all or even mainly in the mind, those women who considered themselves to have the most serious symptoms were not always the ones who were worst affected.

Variations in physical symptoms explained only about 14 per cent of the variations in how ill the women felt. The remainder is probably owing to other factors, such as depression or family support.

An estimated 80 per cent of pregnant women experience some form of morning sickness. Almost half of working women said that their effectiveness at work was affected by the condition, and a quarter took time off because of it.

The Times
4/9/03



Preggie Pops

Naturally
flavoured
lollipops made
especially to
overcome
morning
sickness in
pregnancy.

The Natural Way To Ease
Morning Sickness!

Preggie Pops

7 Delicious
All Natural Flavors!

- Raspberry
- Strawberry
- Lemon
- Orange
- Lime
- Peach
- Apple

Conceived and Delivered by HealthCare Professionals!

The advertisement features a pregnant woman in a floral dress and a wide-brimmed hat standing in a field. In the background, there is a large wheel with seven segments, each representing a different flavor of the lollipops. The text is overlaid on the image, providing information about the product and its benefits for morning sickness.

Morning sickness
P-5-P
Ginger



Stretch marks

Rub into abdominal skin

Vitamin E and Vitamin D cream

2x day

Pre-Eclampsia

Omega 3 oils shown to reduce levels of preclampsia.

Pre-eclampsia is often thought to be a Magnesium deficiency but Vitamin E and Selenium status should also be assessed for.

Pre-Labour

**Raspberry leaf tea
can be taken from
30 weeks.**



Labour

1. Zinc required for the production of prostaglandins and hormones essential to initiate labour

2. Zinc promotes elasticity of the perineum during labour and birth. If perineal area is able to stretch readily tearing and episiotomies less likely.

3. Zinc deficient women tend to have longer labours and require more medical intervention

4. Zinc deficiency is linked to weakening of the uterine muscle tissue effecting the efficiency of labour contractions.

5. Zinc packs into placenta at the end of pregnancy and copper levels rise

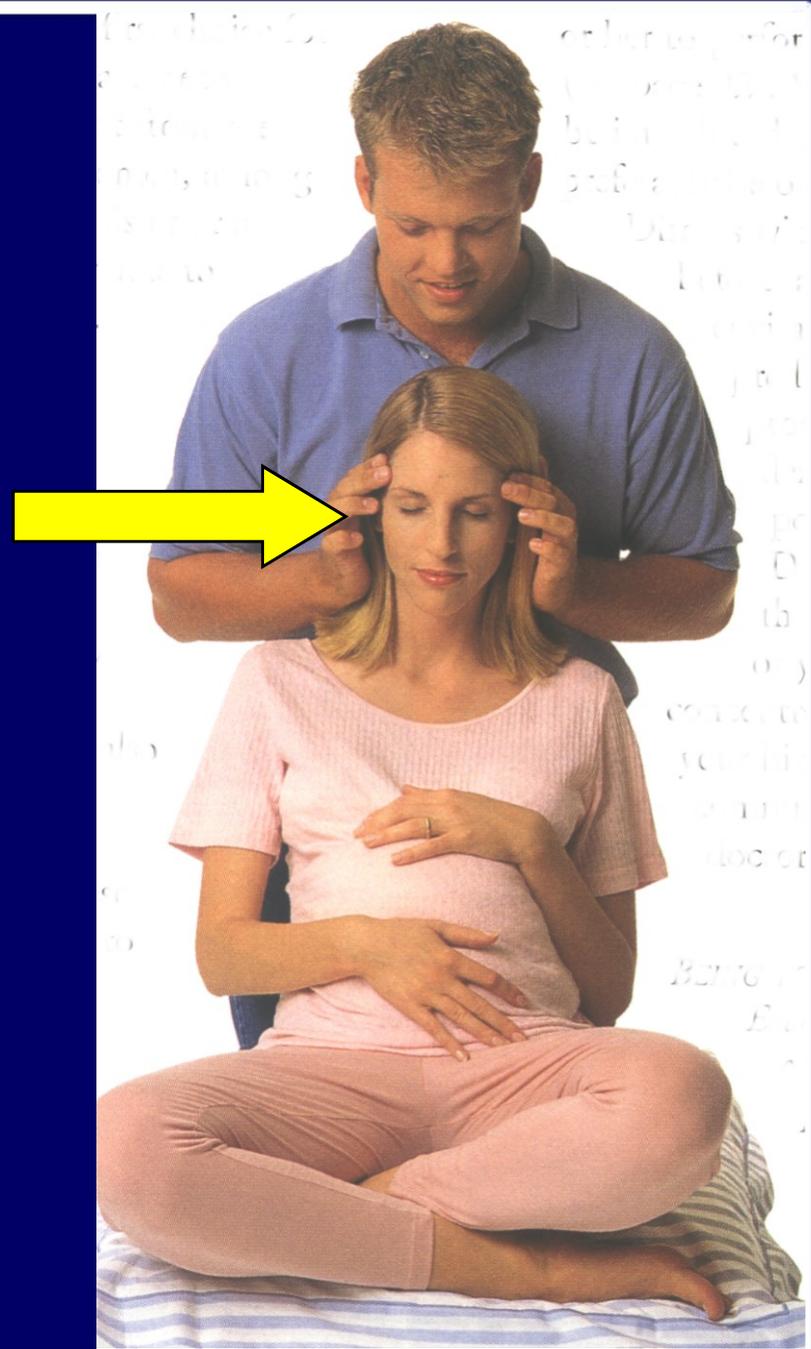
6. Following birth Zinc levels fall with expulsion of the placenta and Copper levels remain high, thought to be a factor in postnatal depression.

Magnesium is required for
smooth muscle contraction of the
uterus

Test for ionizable form of
Magnesium.

P-5-P and L-Tyrosine can be given on tongue while SI 19 points tapped with concurrent uterine therapy localisation to decrease the pain of contractions*

*Chris Astill-Smith





Post-Natal Depression

Post-Natal Depression

Occurs usually 40-48 hours after birth or when the milk comes in.

Test mother for Magnesium deficiency following massive loss due to smooth muscle contraction through the labour.

Test mother for **Zinc** deficiency as there is high zinc loss on expulsion of the placenta.

Also **Omega 3 fatty acids**.

Cranial

Predominant probiotics in treating depression states

B. Bifidum

B. Lactis

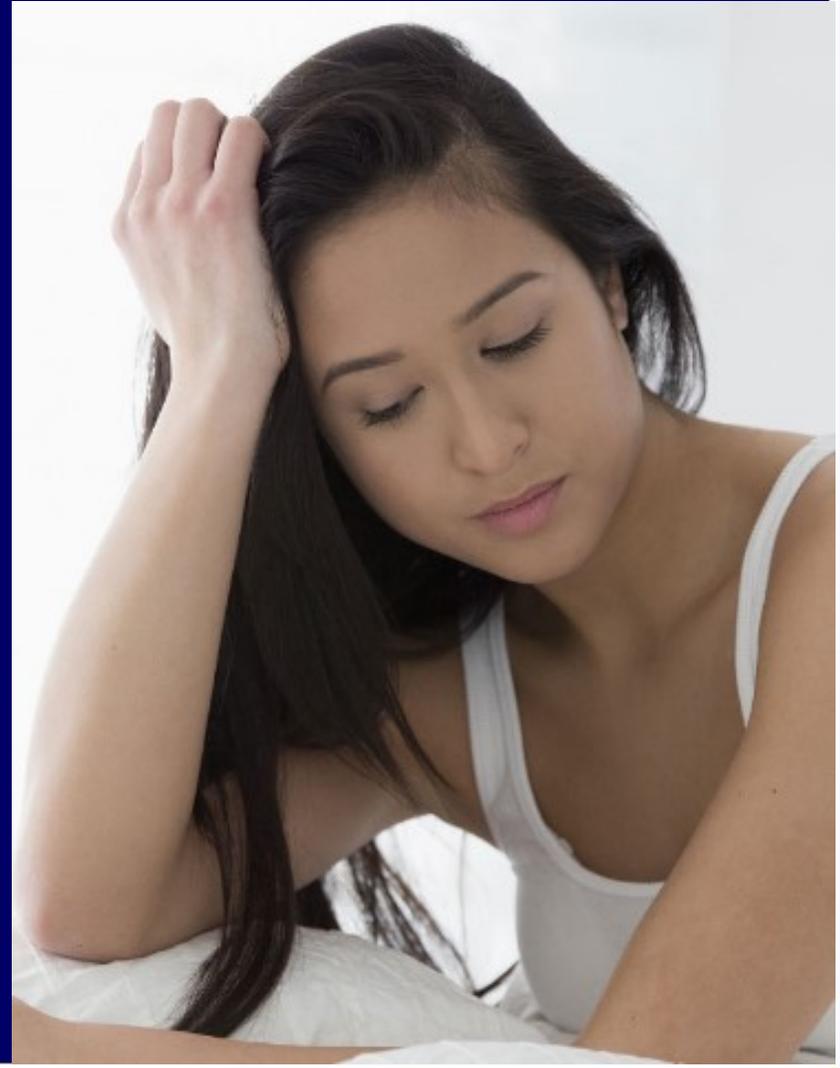
L. Acidophilus

L. Breve

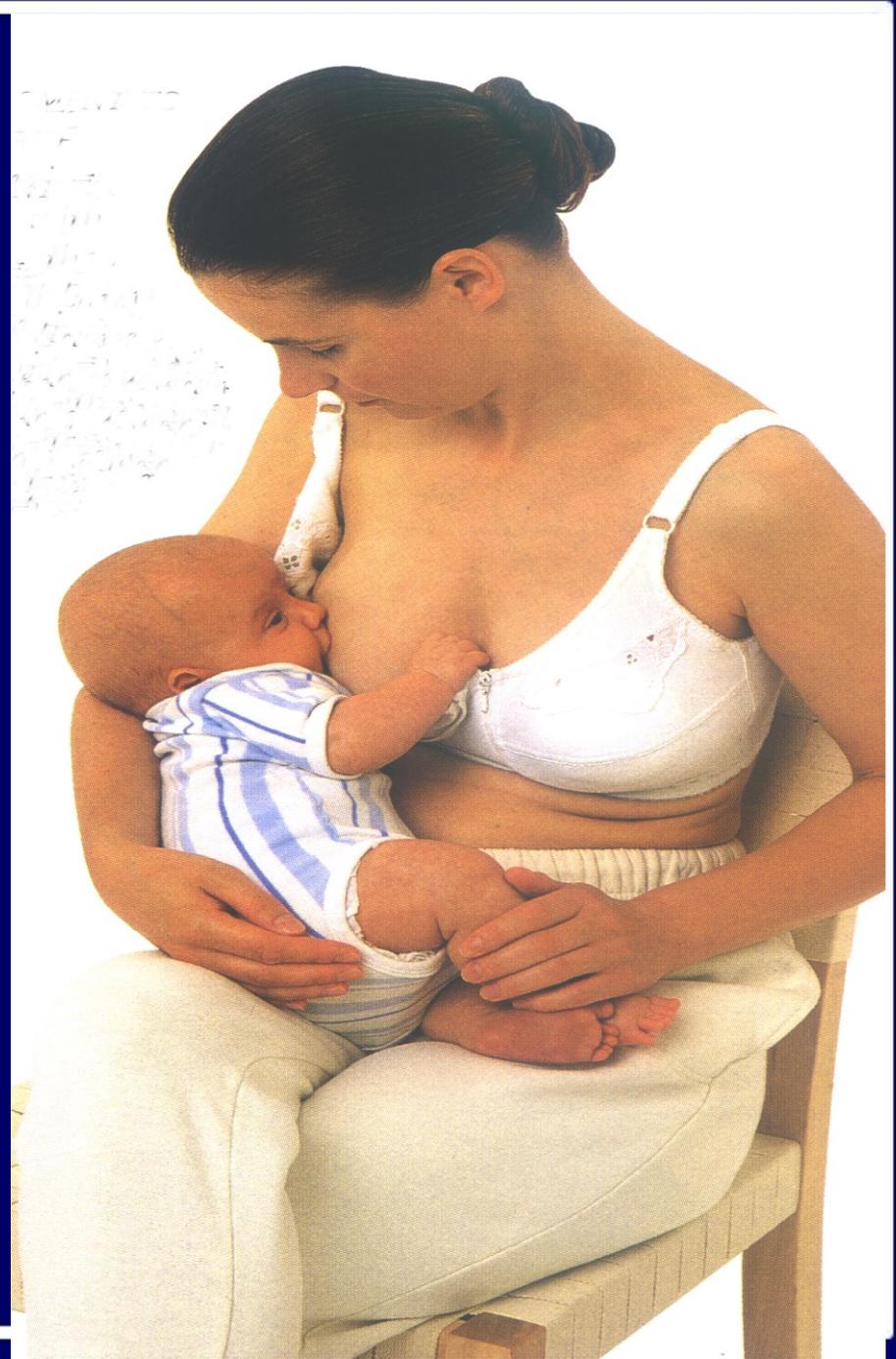
L. Casei

L. Salivarius

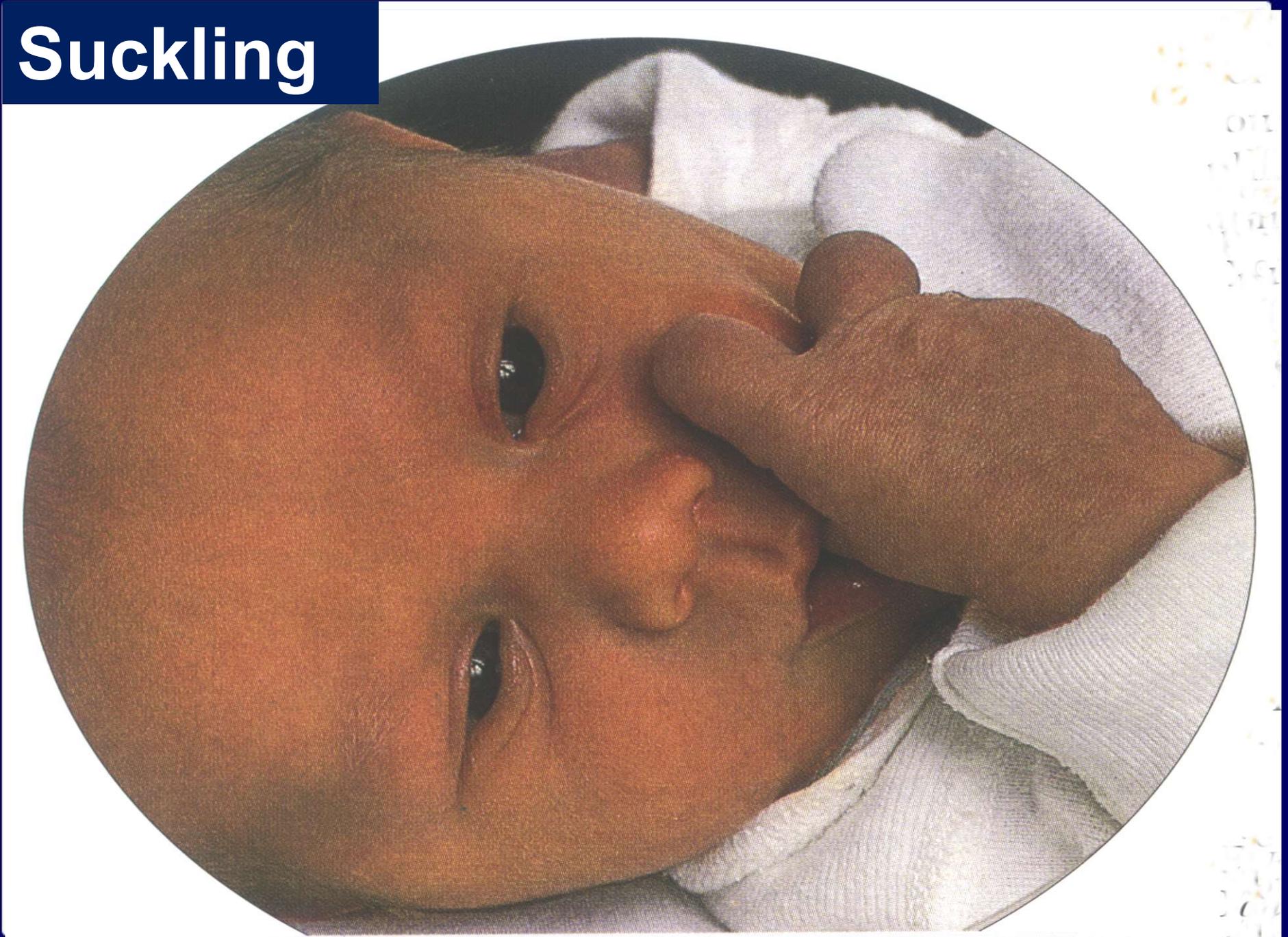
L. Lactis



Lactation



Suckling



1. Suckling initiates afferent impulses that travel by sensory neurones from the areola to the hypothalamus. Here they stimulate magnocellular neurones that stimulate the posterior pituitary to release oxytocin. The oxytocin causes contraction of the myoepithelial cells and release of milk.

2. Human milk has high lactose content, providing 40% of the calories available to the infant.

This is because the infant's brain is large and requires glucose as a metabolic substrate and lactose is broken down to glucose and galactose prior to intestinal absorption.

Also **lactose secretion** obligates the secretion of a large amount of water due to osmosis supplying the infant's water requirements.

3. As lactose is only synthesised from **glucose, maternal glucose utilisation is increased by 30% in fully lactating women.**

Macronutrient Composition of Human Milk

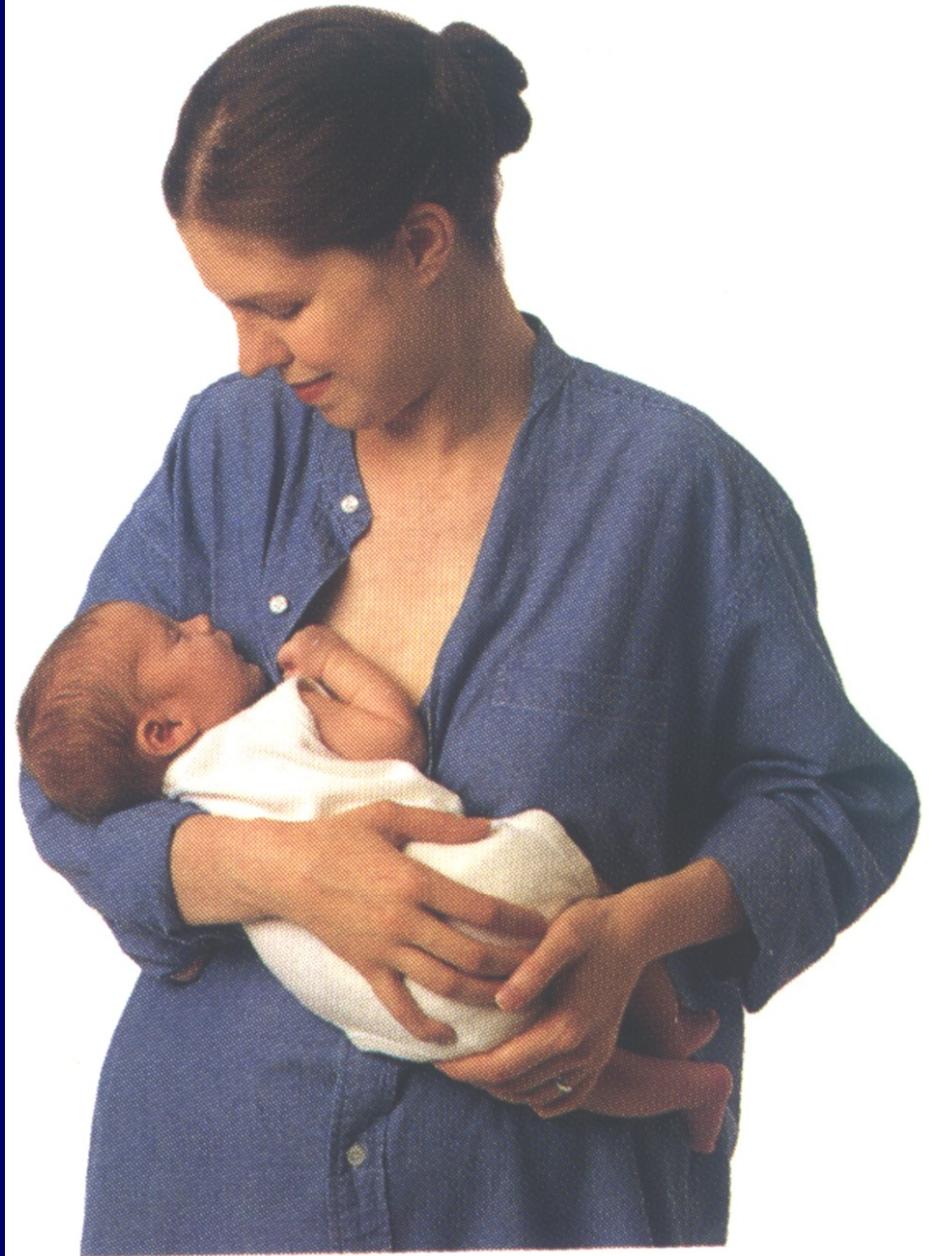
Human vs. Bovine Milk Composition

Component	Human Milk	Bovine Milk
Carbohydrates		
Lactose	7.3 g/dl	4.0 g/dl
Oligosaccharides	1.2 g/dl	0.1 g/dl
Proteins		
Caseins	0.2 g/dl	2.7 g/dl
α -Lactalbumin	0.2 g/dl	0.1 g/dl
Lactoferrin	0.2 g/dl	Trace
Secretory IgA	0.2 g/dl	0.003 g/dl
B-Lactoglobulin	None	0.36 g/dl
Milk Lipids		
Triglycerides	4.0 %	4.0 %
Phospholipids	0.04 %	0.04 %
Minerals		
Sodium	5.0 mM	15 mM
Potassium	15.0 mM	45 mM
Chloride	15.0 mM	35 mM
Calcium	8.0 mM	30 mM
Magnesium	1.4 mM	4.0 mM

1. The **oligosacharrhides** are complex sugars, which include glucose, galactose, fucose, N acetylglucosamine, N acetylgalactosamine, N acetylneuraminic acid, mannose and sialic acid.

These can act as growth factors for **lactobacillus**, which populates the GI tract of the breast-fed infant and as protective factors against bacteria. Fucose, galactose, mannose, galactosamine, glucosamine and sialic acid also binds B12 making it more bio available.

2. A histidine rich glycoprotein has been found in colostrum and breast milk that binds copper and zinc.



3. Human milk proteins include casein. This is low compared to other mammals due to slow growth of human infant. The casein is also bound to calcium and phosphate. Other proteins are alpha lactoalbumin, which synthesises lactose and lactoferrin.

This is a Fe binding protein found in colostrums and milk. As Fe is needed for bacteria to multiply, and lactoferrin binds to the Fe, it is therefore considered to have **antibacterial properties**. It protects against E Coli, Klebsiella, Pseudomonas and Listeria.

Lactoferrin is increased in colostrum and in mastitis. Other proteins are immunoglobulin IgA, lysozyme, lipases, and growth factors.

4. Milk Lipids constitute about 4% of human milk. Most of these are triglycerides. 20% of these are derived from medium chain fatty acids made in the mammary gland and 80% are derived from plasma. Milk also contains phospholipids and cholesterol in small amounts

Minerals.

Milk contains small quantities of sodium, potassium, chloride, calcium and magnesium.

Milk contains predominantly **Omega 6 fatty acids** but ideally should contain equal Omega 3 and 6 fatty acids.

5. Amino Acids Human milk has high cysteine: methionine ratio and some taurine. Cows milk has low cysteine to methionine ratio and no taurine.

The human infant's liver and brain have low levels of cystathionase, the enzyme converting methionine to cysteine (the foetus and pre-term infant are completely lacking this enzyme).

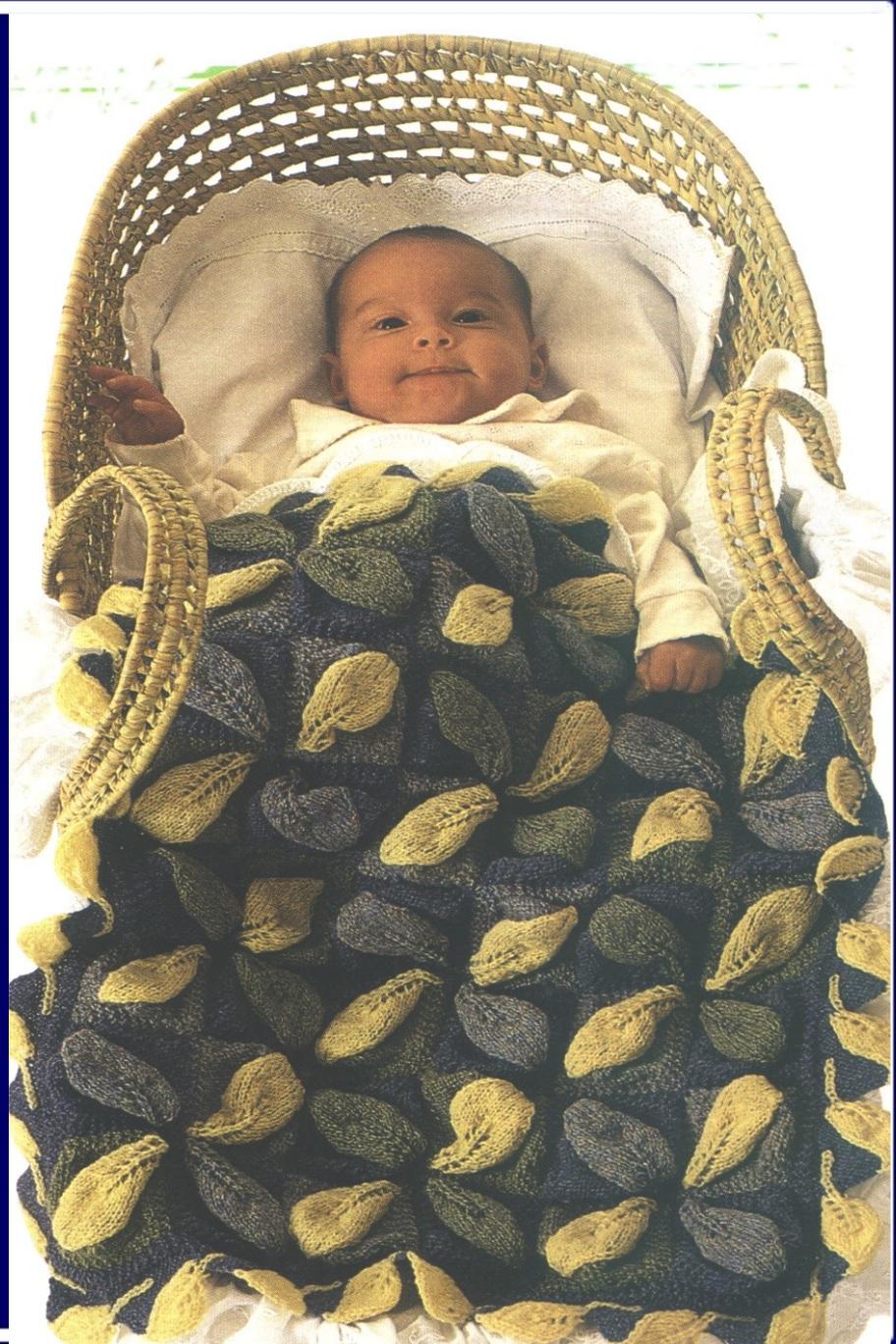
Taurine is made from cysteine (by cysteinesulfonic acid decarboxylase enzyme). Cysteine is needed for CNS development. Taurine is needed for the infant for brain development and function, retinal development and function and conjugation of bile salts.

**Also human milk is low in
phenylalanine and tyrosine.
Infants have limited ability to
metabolise these, which can
build up and cause PKU
(Phenylalanine ketone urea)**

6. Cholesterol is needed by the infant in challenging the development of cholesterol metabolising enzymes. It contributes to synthesis of nerve tissue and bile salts.

7. Check B12 deficiency in breast fed babies of strict vegetarian and vegan mothers

Contaminants in Human Milk



1. Most lipophilic and hydrophilic compounds will pass from the mother into the milk

2. Many antibiotics, anticoagulants, anti-thyroid drugs, alcohol, nicotine and caffeine are transferred to the milk.

3. Many environmental contaminants which are stored in the body adipose tissue of the mother are mobilized during lactation and end up in the milk (such as pesticides, industrial contaminants like PCB's and radiation and many known carcinogens).

Need to test for baby weakening to mother's milk with **surrogate** and **supplement** if required the **mother** accordingly.



Mastitis



1. Symptoms include fever, and painful red lumps in the breast.

2. Bacteria, viruses, parasites, fungi, radiation, chemicals or heavy metals can cause this. The infections can be systemic focalising in the milk duct creating a blockage, or passed by the mouth from baby to mother during suckling.

**Treat with anti bacterial i.e.
Colloidal silver, Goldenseal,
antiviral, Echinacea
Digestive enzymes
Probiotics**

Radiations, chemicals or metals may be due to environmental exposure or mobilization from adipose tissue.

Treat with Ornithine, Taurine, NAC, Vitamin C, Phospholipid or similar detox remedy (e.g. Lemon balm, Yarrow,)

It is important that the infant **continues to suckle** to maintain milk production and continuous flow to drain the toxin.



Engorgement

**Wrap
chilled
cabbage
leaves
around the
affected
breast.**

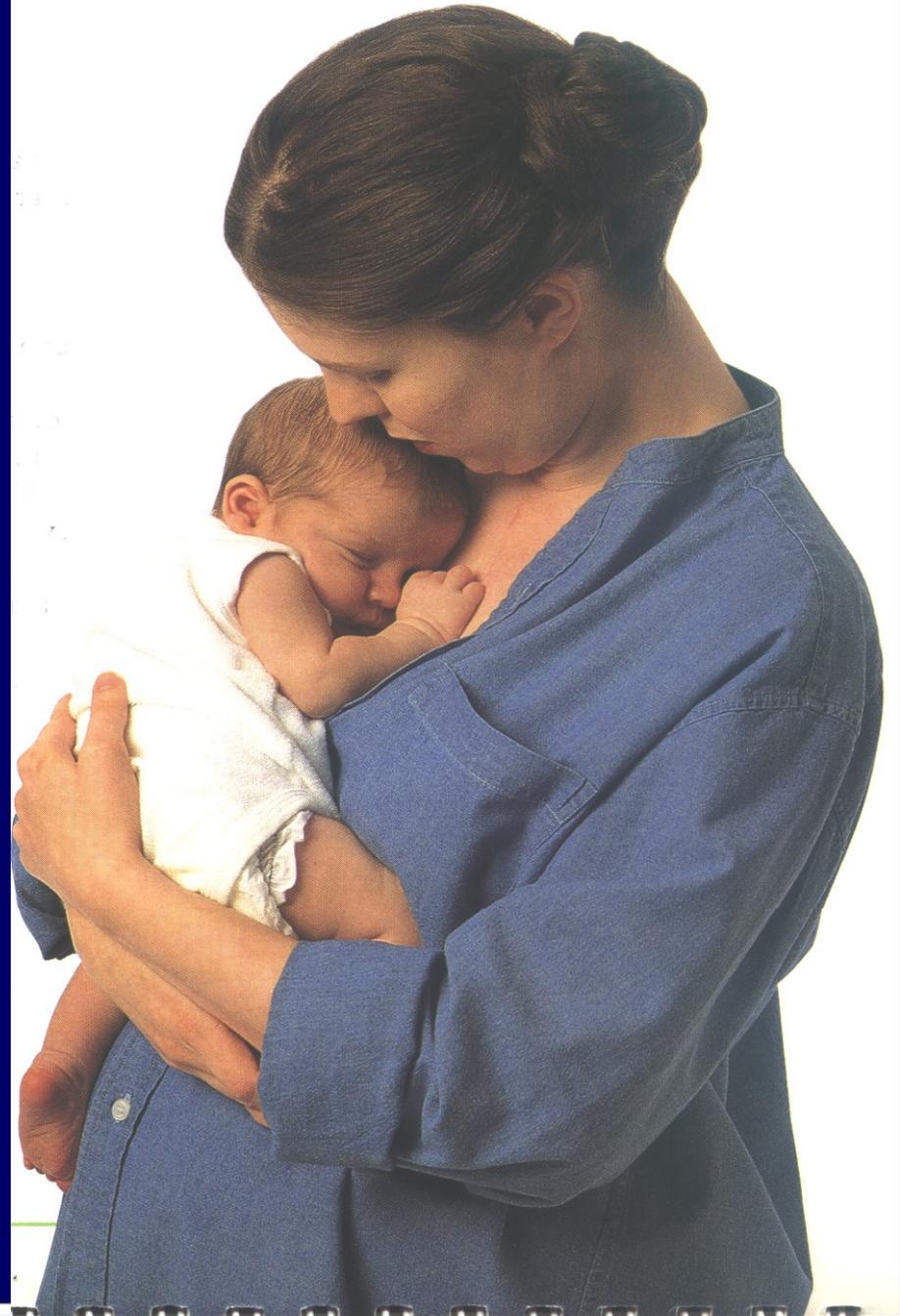


Cracked Nipples

**Rub Vitamin E over nipple,
making sure to clean it off before
feeding.**

**Check for fungal infections
locally and prescribe tested
antifungal herb applied locally.**

Increasing Milk Production



- 1. Increase infant suckling**
- 2. Increase water intake**
- 3. Take herbal galatagogue, such as Star anise, Chaste berry, Fenugreek, Milk Thistle Seed, Nettle Leaf, Raspberry leaf tea**
- 4. Black cumin seed oil**
- 5. Avoid large amounts of sage and parsley which may decrease milk flow**



**Raynauds Phenomena
(Blanching of the nipple)**

May occur in fingers, nipple or both. Occurs as a response to a drop in temperature. Occurs after feeding is over. After baby detaches, the nipple turns white and burns. It may then throb as the blood returns. This may last minutes or hours

Prescribe P-5-P, Vitamin B3, Vitamin E, EFAs, Selenium (for T3)

4. Toxins

Reactive oxygen species (free radicals) damage is the ultimate mediator of aging.

They are generated by

- a) normal oxidative processes**
- b) infections**
- c) environmental pollutants**
- d) hypoxia**

The Generation of Reactive Oxygen Species

Hart and Setlow in the 1970's exposed DNA of various animals to UV light in order to fuse adjacent molecules of DNA. The length of time of DNA repair. The rate of self repair increased with the overall life expectancy of the animal, i.e. elephants time was shorter than mice.

Humans were found to have the fastest genetic repair rate known.

Later **Schneider** at the National Institutes for Aging verified that older cells repair themselves much less efficiently than do younger ones.

The overall conclusion is that aging results from the inability of **DNA** to keep up with the constant oxidative damage being inflicted on it millions of times per year.

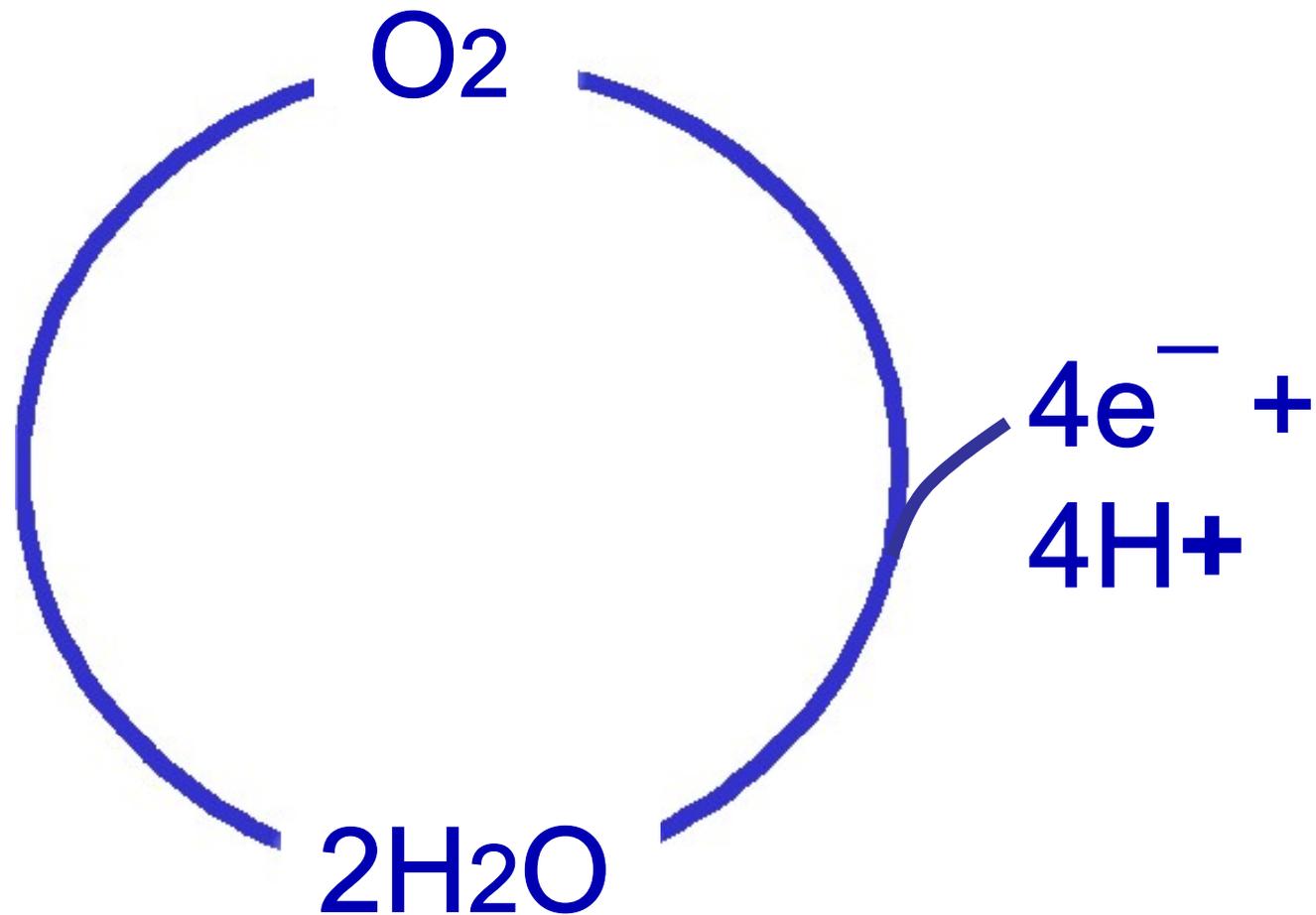


(Damage to the Book of Life)

In the reduction of molecular oxygen at **Complex IV** 4 electrons are required.

However, certain reactions permit this reduction to take place by a series of univalent reductions each of which requires a single electron.

Normal $4 e^-$ reduction of oxygen

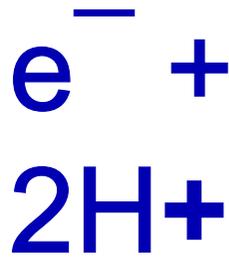


Univalent
reduction
of oxygen

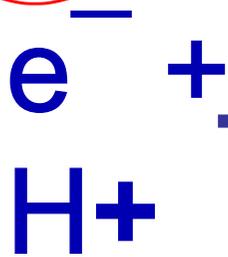
1



2

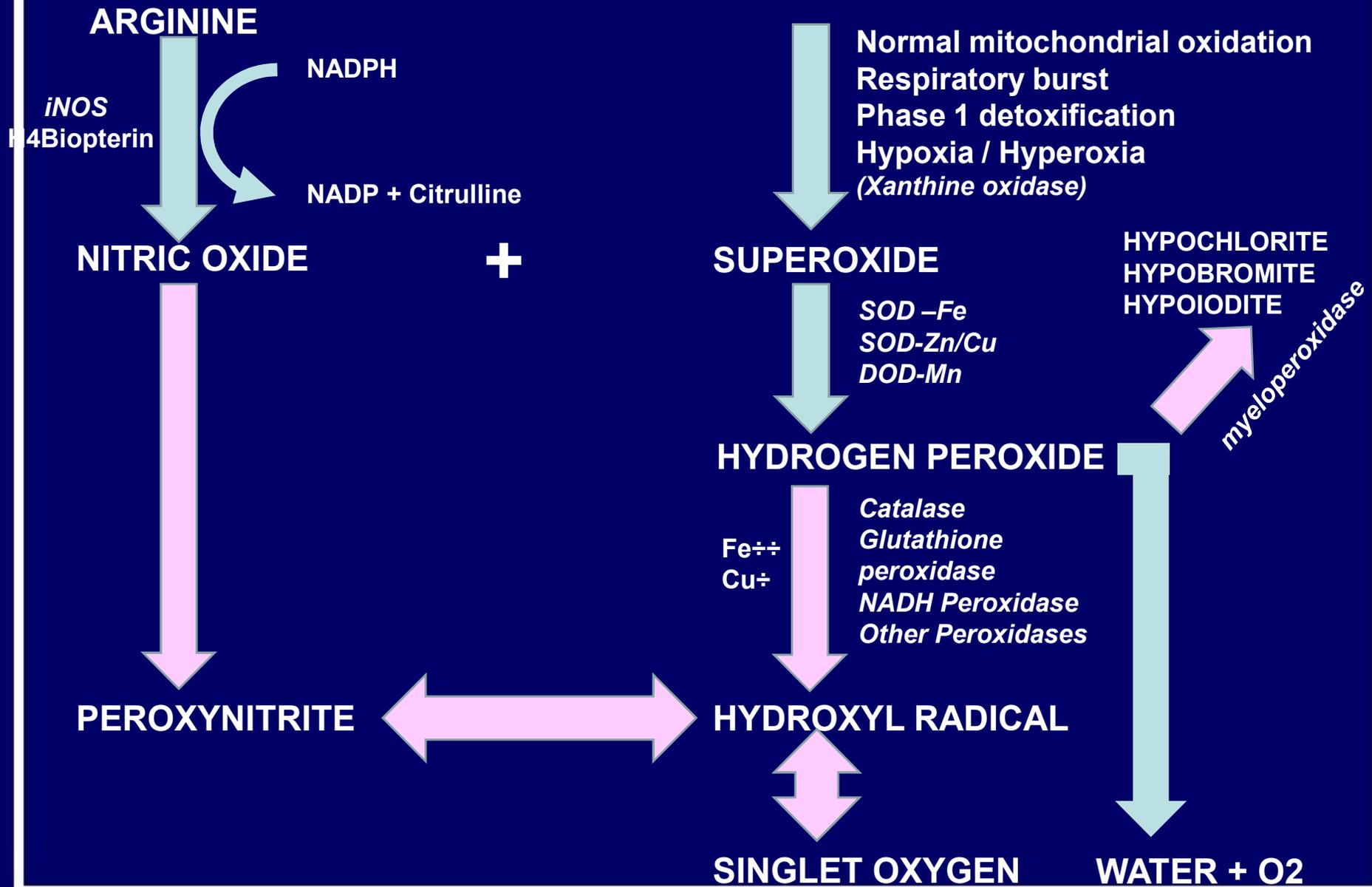


3

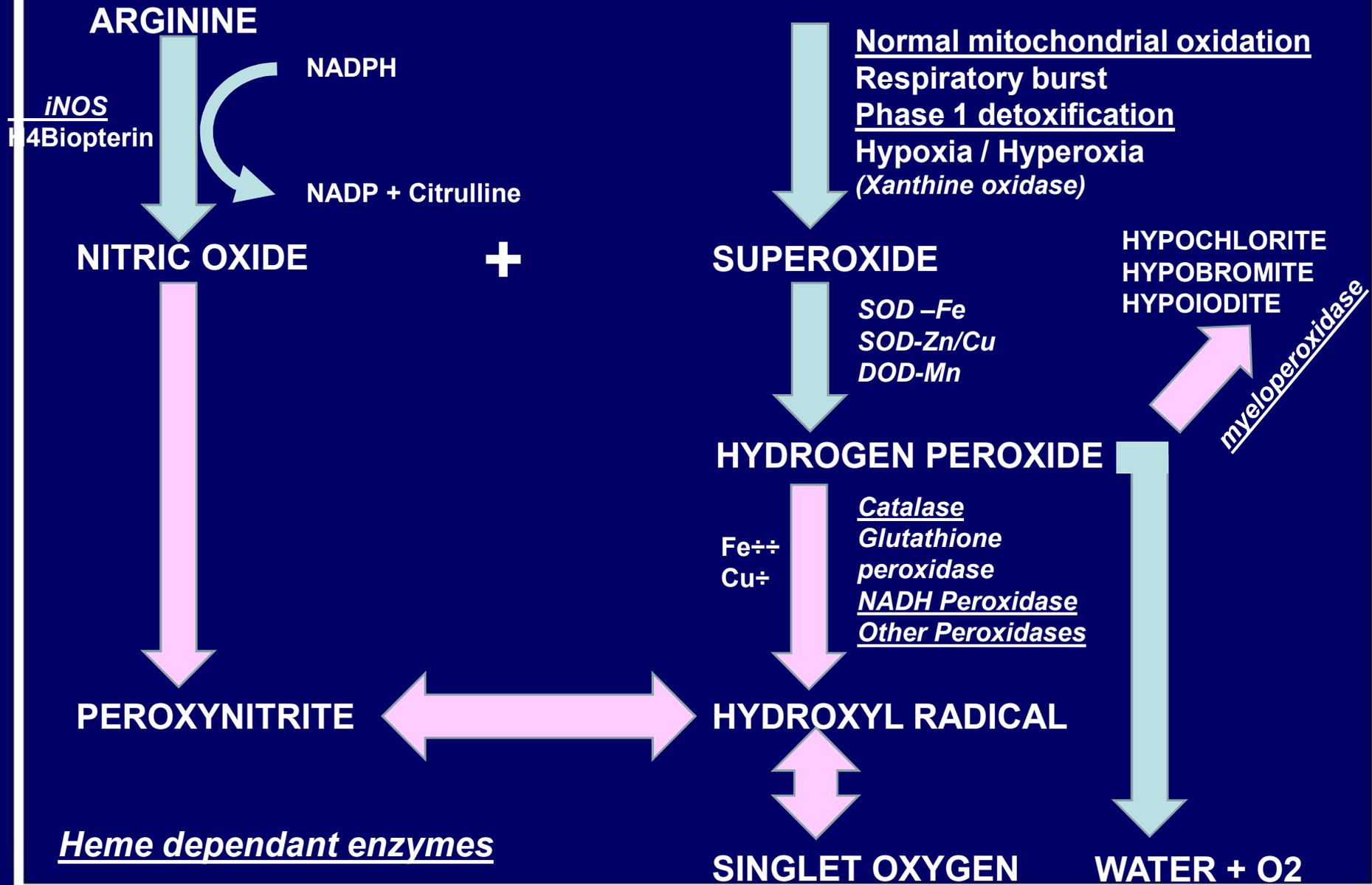


4

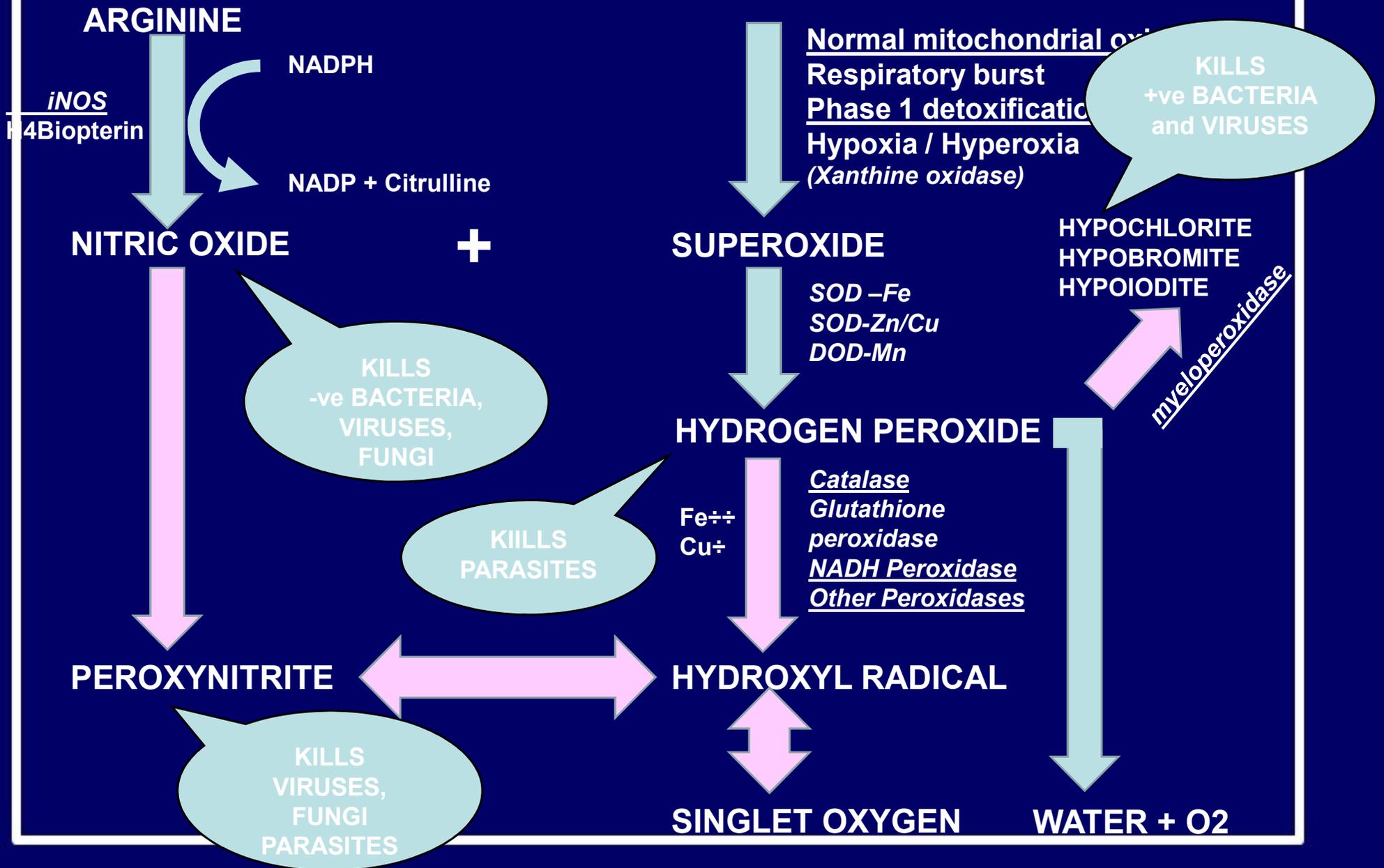
Reactive Oxygen Species



Reactive Oxygen Species



Reactive Oxygen Species



REACTIVE OXYGEN SPECIES (ROS) Challenges

- | | |
|---------------------------|--|
| 1. SUPEROXIDE ANION | = SUPEROXIDE + NADPH + Fe |
| 2. HYDROGEN PEROXIDE | = H ₂ O ₂ |
| 3. Glutathione Peroxidase | = Glutathione Peroxidase |
| NADH Peroxidase | = NADH Peroxidase |
| Peroxidase | = Peroxidase |
| Catalase | = Catalase |
| 4. Hypochlorite anion | = H ₂ O ₂ + KCl or MgCl ₂ |
| Hypobromite anion | = H ₂ O ₂ + KBr or MgBr ₂ |
| Hypoiodite anion | = H ₂ O ₂ + KI or Mgl ₂ |
| 5. HYDROXYL RADICAL | = SUPEROXIDE + NADPH + Fe + H ₂ O ₂ |
| 6. NITRIC OXIDE | = NITRIC OXIDE (NADH + Fe) |
| 7. PEROXYNITRITE | = NITRIC OXIDE + SUPEROXIDE + |
| 8. SINGLET OXYGEN | = H ₂ O ₂ + HYPOCHLORITE |

Antioxidants and enzymatic metabolism

Ultimate challenge for ROS

1. NF Kappa B

2. Cross check against

Vitamin A

Carotenoids

alpha Lipoic acid

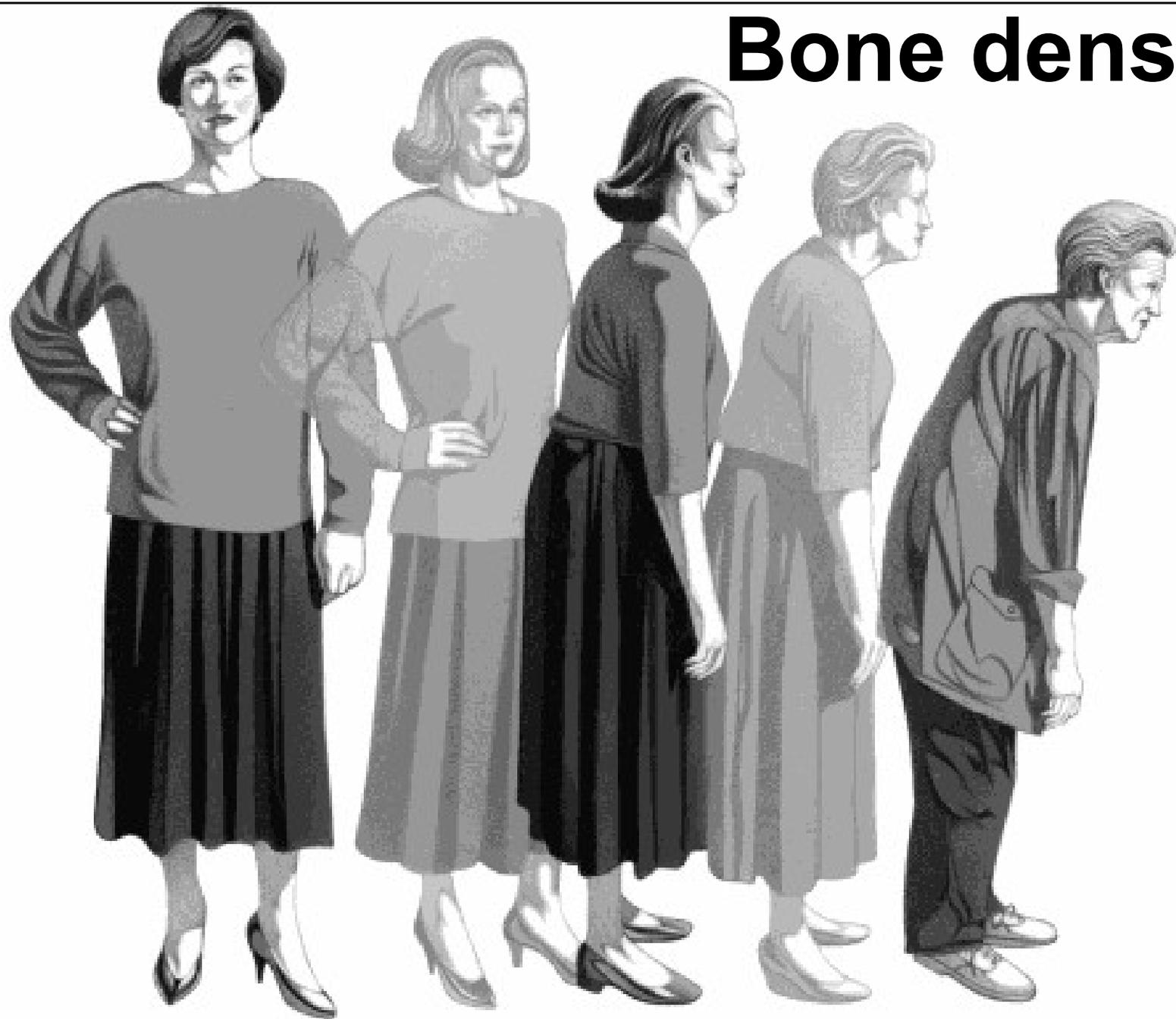
Vitamin C

Vitamin E

CoQ10

Selenium

Bone density



One out of every 2 people over the age of 70 years will suffer from a bone fracture as a result of osteoporosis with one in 5 diagnoses being in men.

Simple steps, starting young, would put all these percentages close to zero.

Women over 50 are more likely to get osteoporosis than breast cancer, heart disease and ovarian cancer combined.

In the case of hip fractures, **one third** die of complications within a year and for another third the rate of death remains higher than otherwise expected for years after a hip fracture, even in patients who seem to have made a full recovery.

Almost all of these cases could have been prevented.

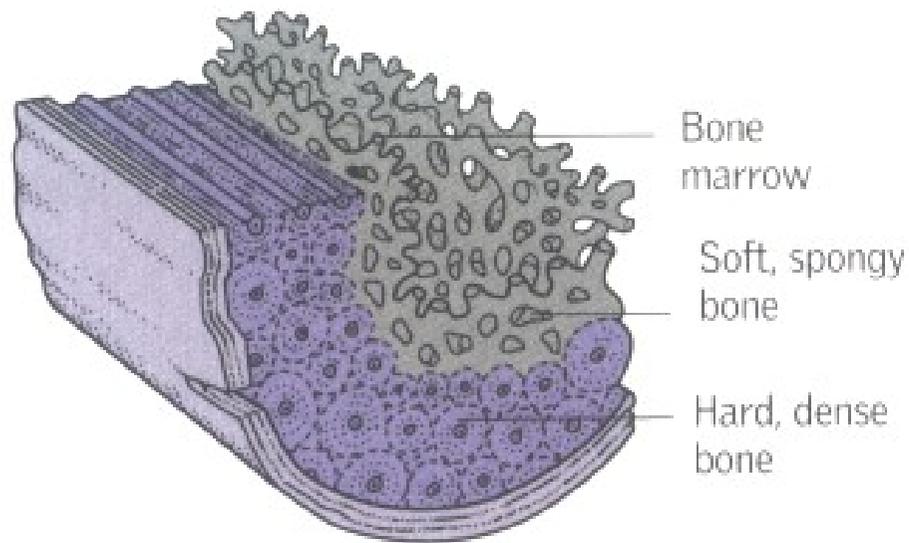


Osteoporosis means “porous bones” (bones with holes) so brittle that they can fracture from the force than nothing more than a sneeze.

Osteomalacia means “soft bones”.

Osteopenia means low bone mass.

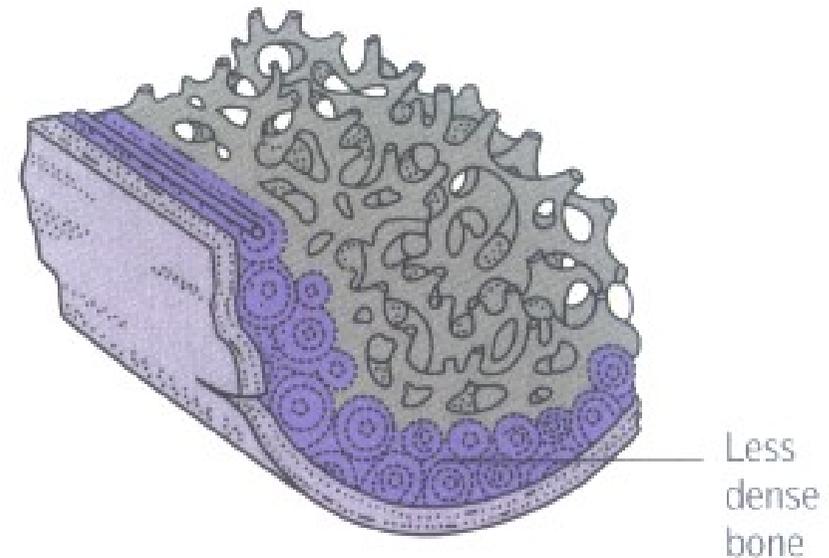
Normal bone



Normal bone cross-section

Bone consists of fibres of collagen (a protein), which give elasticity, and calcium, which gives hardness.

Osteoporosis



Osteoporotic bone

Thinning is due mainly to loss of collagen, which takes calcium with it. Both hard and spongy bone tissues are affected.

Bone contains both organic and inorganic material. The principal proteins of bone are:-

Collagen Type 1 is the major protein comprising 90-95% of the organic material.

Collagen Type V is present in small amounts.

Other non-collagen proteins.

The inorganic or mineral component is mainly **hydroxyapatite** ($\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$) along with Sodium, Magnesium, Carbonate and Fluoride. Approximately 99% of the body's calcium is contained in bone.

Hydroxyapatite confers on bone the strength and resilience required by its physiological roles.

The dynamic structure of bone undergoes continuing cycles of **remodelling**, consisting of resorption followed by deposition of new bone tissue.

This **remodelling** permits bone to adapt to both physical (e.g. increases in weight bearing) and hormonal signals.



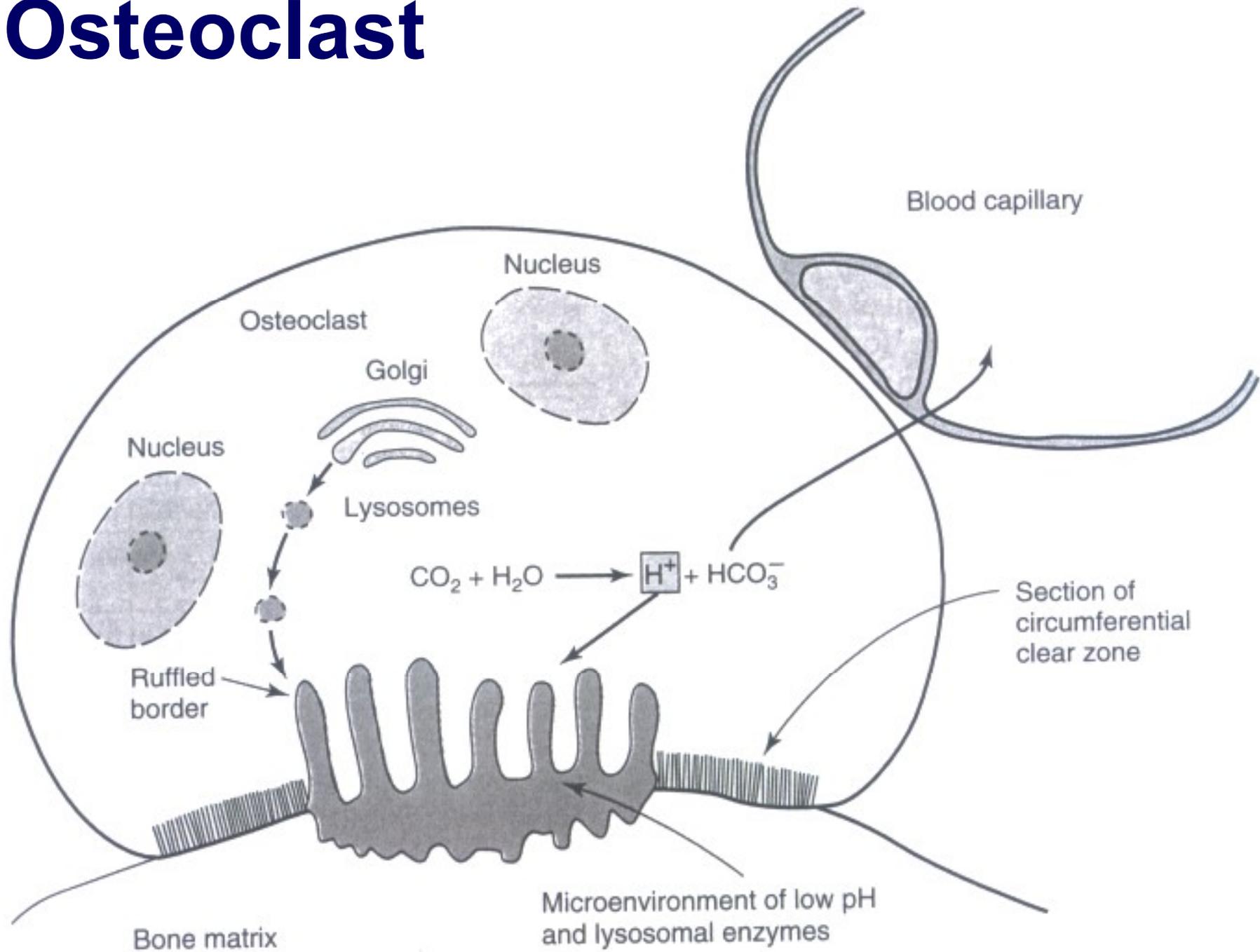
The major cell types involved with bone resorption are the **osteoclasts.**

Osteoblasts are involved with the deposition of bone.

Osteoclasts are multinucleated cells derived from pluripotent hemopoietic stem cells.

Osteoclasts possess an apical membrane domain exhibiting a ruffled border that plays a key role in bone resorption.

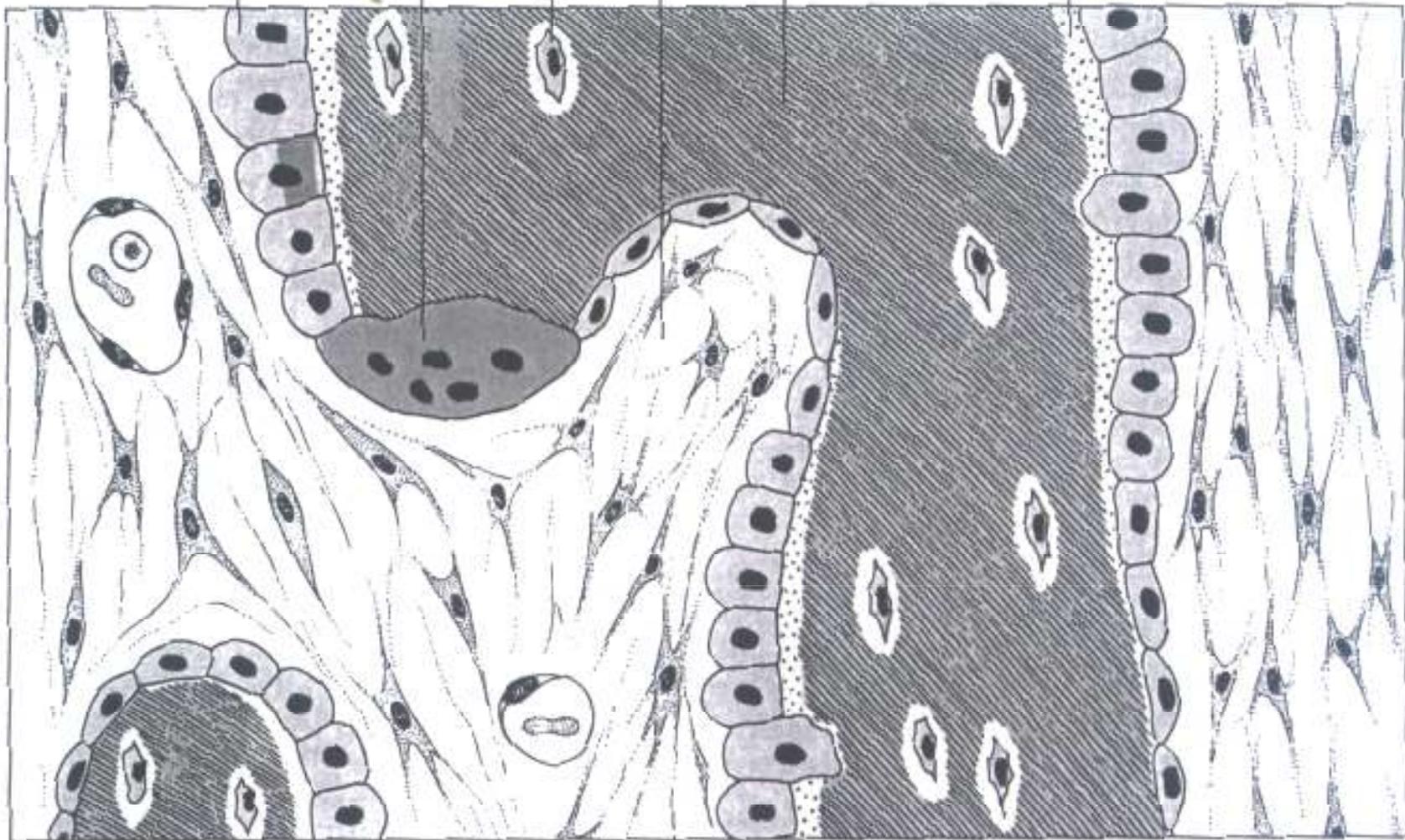
Osteoclast



A proton-translocating ATPase expels protons across the ruffled border into the **resorption** area, which is the microenvironment of low pH. This lowers the local pH to 4 or less, thus increasing the solubility of **hydroxyapatite** and allowing demineralization to occur.

Lysosomal acid proteases are released that digest the now accessible matrix proteins.

Osteoclast Mesenchyme Newly formed matrix (osteoid)
Osteoblast Osteocyte Bone matrix



Osteoblasts – mononuclear cells derived from pluripotent mesenchymal precursors – synthesize most of the proteins found in bone as well as various growth factors and cytokines. They are responsible for the deposition of new bone matrix (osteoid) and its subsequent mineralization.

Osteoblasts control mineralization by regulating the passage of calcium and phosphate ions across their surface membranes (which contain alkaline phosphatase, a zinc dependant enzyme, used to generate phosphate ions from organic phosphates).

Several factors have been implicated in the mechanisms involved in mineralization.

Alkaline phosphatase contributes to mineralization but in itself is not sufficient.

Small vesicles (matrix vesicles) containing calcium and phosphate have been described at sites of mineralization, but their role is not clear.

The principal proteins found in bone.¹

Proteins	Comments
Collagens	
Collagen type I	Approximately 90% of total bone protein. Composed of two $\alpha 1(I)$ and one $\alpha 2(I)$ chains.
Collagen type V	Minor component.
Noncollagen proteins	
Plasma proteins	Mixture of various plasma proteins.
Proteoglycans²	
CS-PG I (biglycan)	Contains two GAG chains; found in other tissues.
CS-PG II (decorin)	Contains one GAG chain; found in other tissues.
CS-PG III	Bone-specific.
Bone SPARC ³ -protein (osteonectin)	Not bone-specific.
Osteocalcin (bone Gla protein)	Contains γ -carboxyglutamate residues that bind to hydroxyapatite. Bone-specific.
Osteopontin	Not bone-specific. Glycosylated and phosphorylated.
Bone sialoprotein	Bone-specific. Heavily glycosylated, and sulfated on tyrosine.
Bone morphogenetic proteins (BMPs)	A family (eight or more) of secreted proteins with a variety of actions on bone; many induce ectopic bone growth.

Stimulated by copper dependant IGF-1

Functional Test

Weak muscle strengthens to bone meal.

DHT*

Strong muscle weakens to phosphorus.

Vibration over bone**

•Chris Astill-Smith

•**Joe Shafer

MENOPAUSE

High Prolactin with hot flushes

Consider P-5-P

Zinc

Magnesium

Chasteberry

**Fibroids High 4 Methoxyestradiol
and 4 or 16 Methoxyestrone**

Consider P-5-P

Zinc

Magnesium

Selenium – Glutathione

Sulphur

Acetylation

Glucuronidation

The Pantaloon

65-? years

Longevity and how communities look after old people.

Dr Ellen Langer and taking old people back 30 year experiment.

Massachusetts Health Education and Welfare Dept – Looking at the risk factors for heart disease.

50% of the time the first symptom of heart disease is death.

Two causes –

1. Job dissatisfaction
2. Self happiness rating

More people die on Mondays.

Dr Sheldon Deal ICAK- USA meeting Chicago 2018

As men age their **testes get smaller** and softer and sperm morphology (shape) and motility decline.

Test with different forms of Zinc.

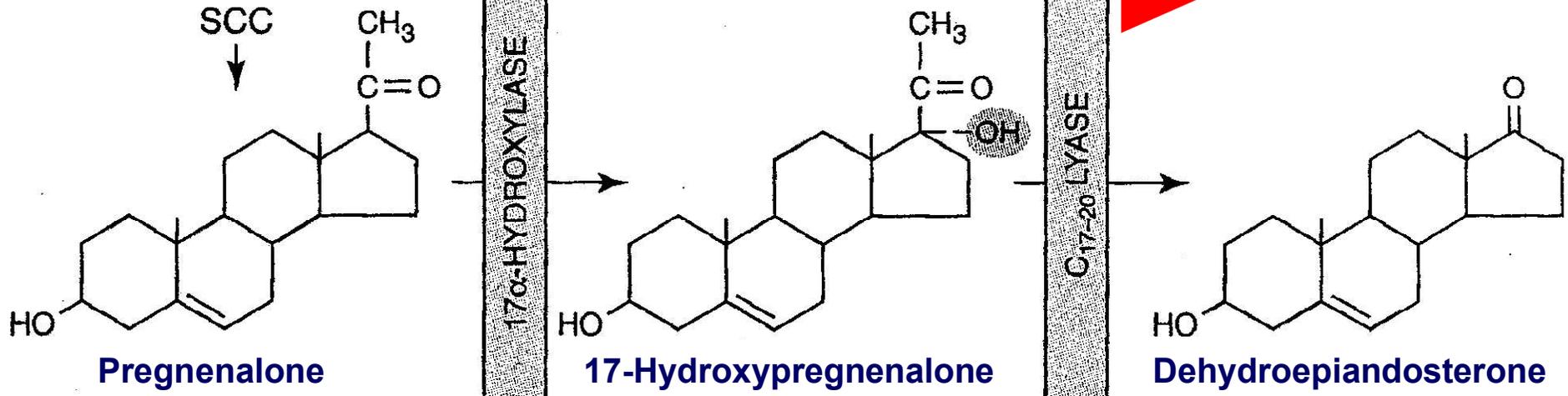
Problems with **libido or erections** can be due to toxicity i.e. heavy metals or testosterone deficiency



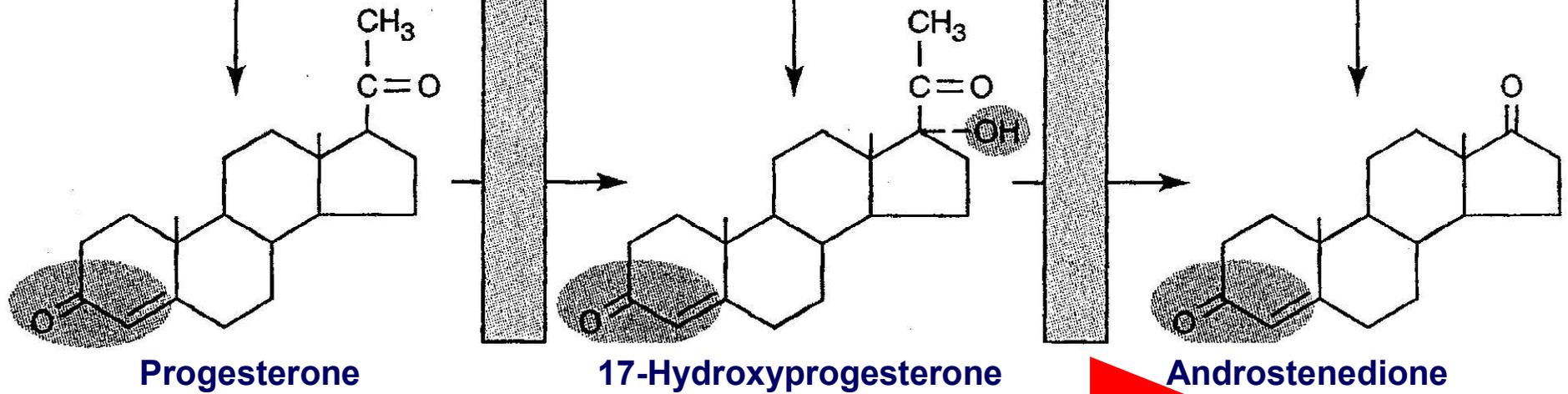
**The synthesis of the
ANDROGENS
(testosterone)**

Cholesterol

Follicular phase

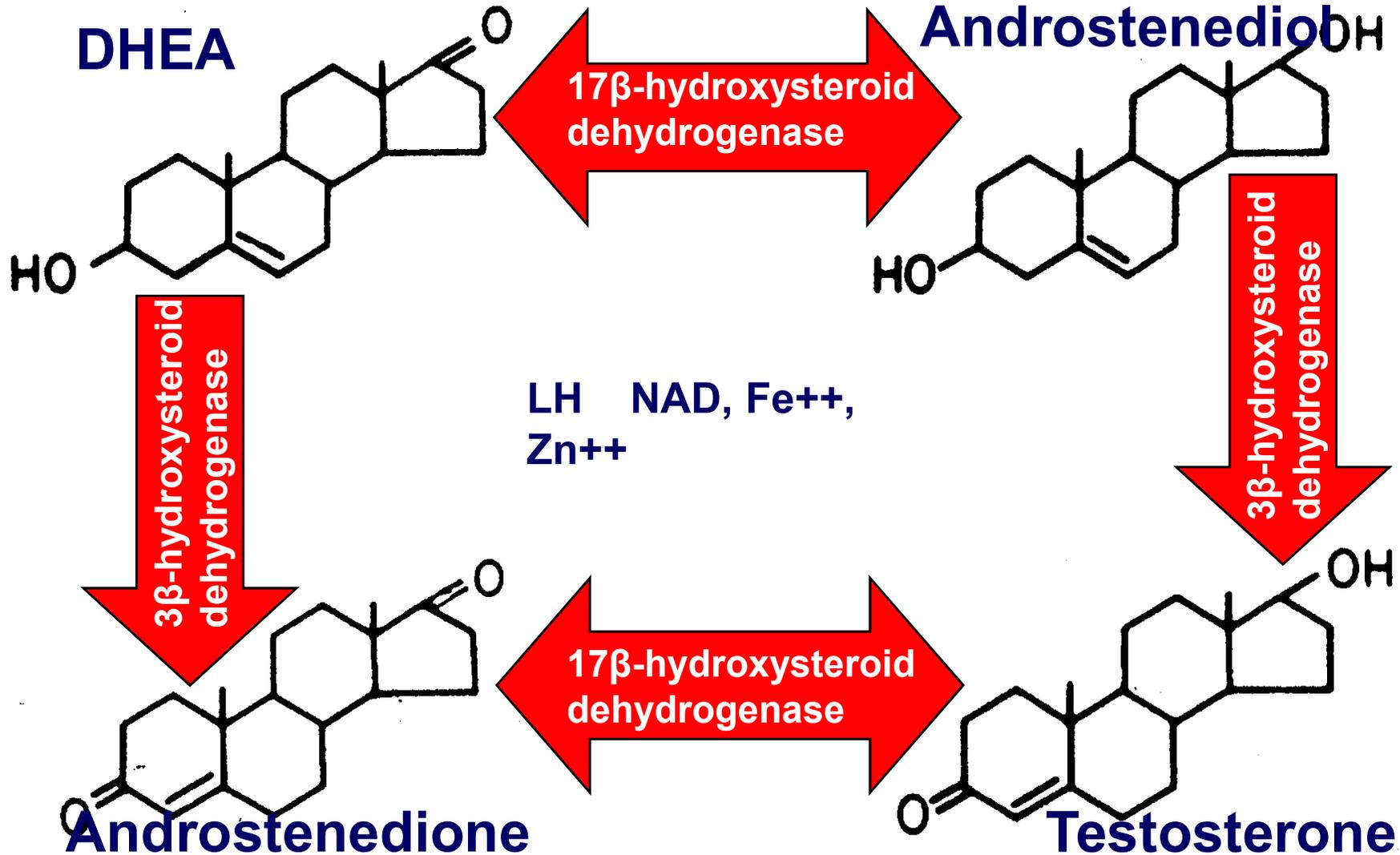


3 β -HYDROXYSTEROID DEHYDROGENASE: $\Delta^5,4$ ISOMERASE



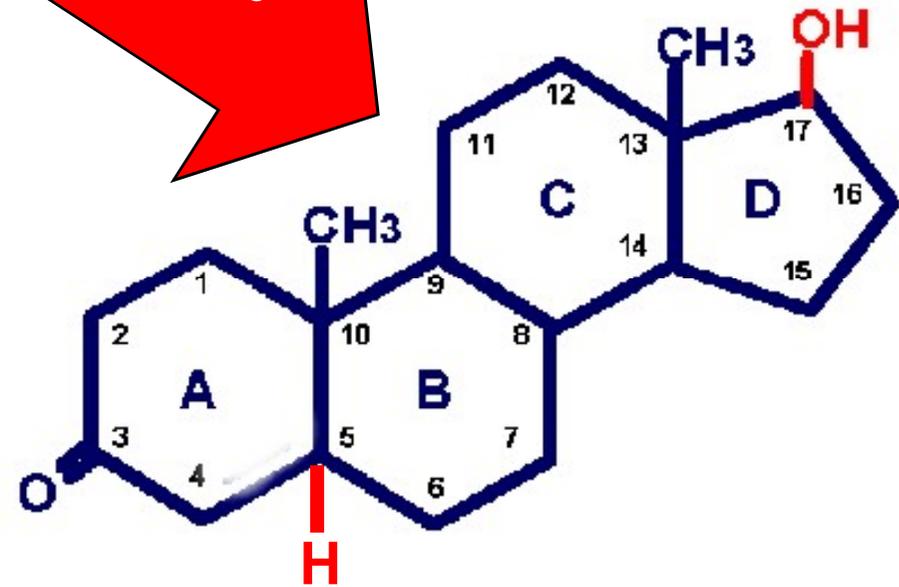
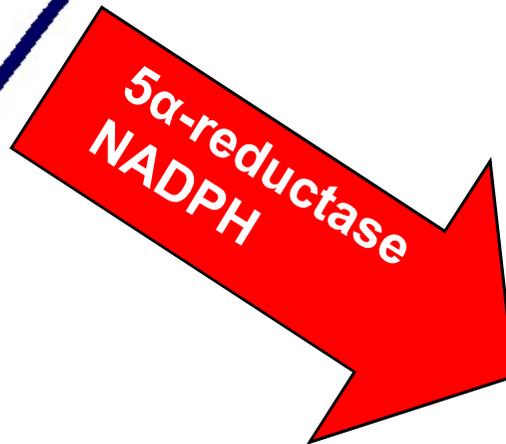
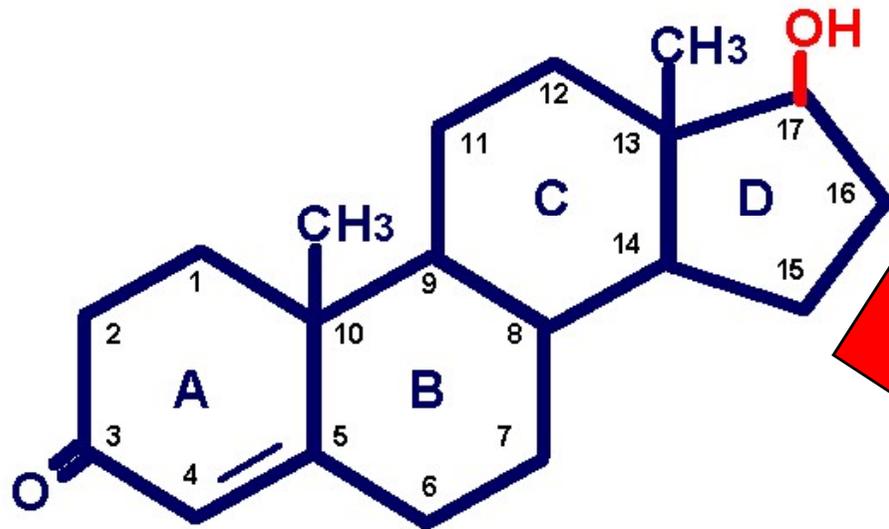
Luteal phase

Follicular phase



Luteal phase

Testosterone



Dihydrotestosterone

**Prescribe, Adrenal extract or
individual nutrient in pathway**

P-5-P

Zinc

Magnesium

Ornithine

There are four factors that influence aging

- 1. Premature cognitive commitments**
- 2. Exercise**
- 3. Nutrition**
- 4. Toxins**

1. Premature cognitive commitments

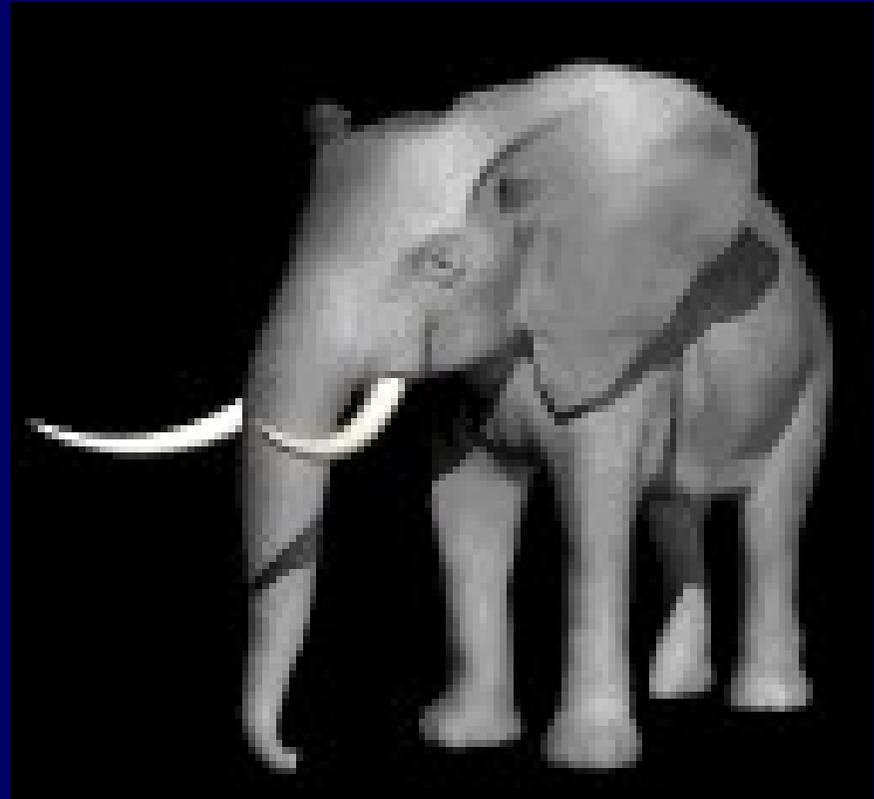


We become committed to a certain reality of aging. People grow old and die because they see others grow old and die.

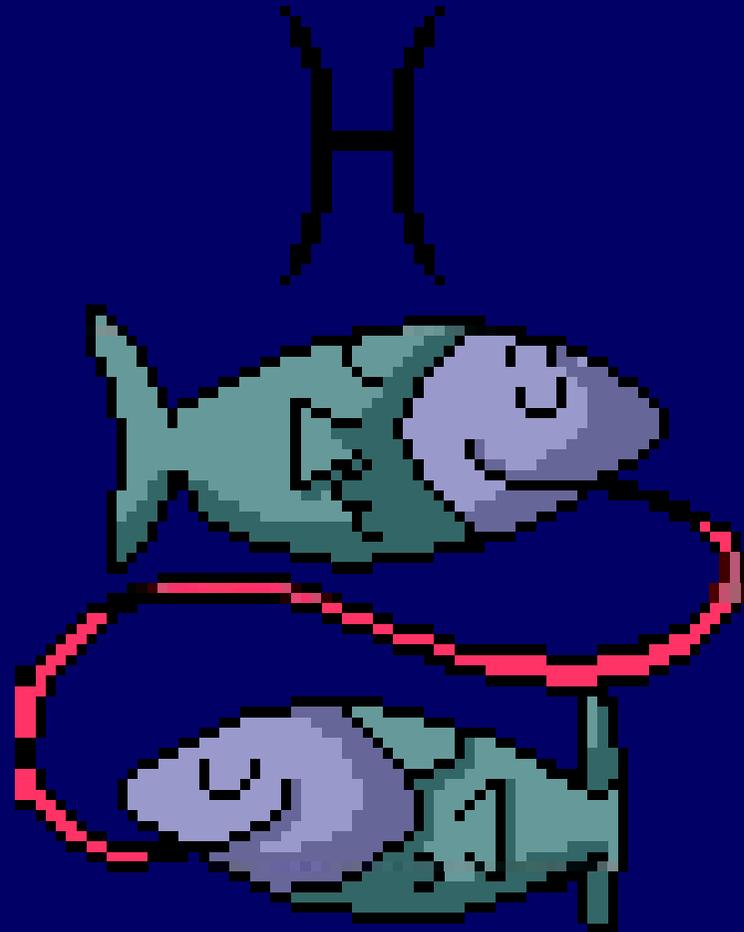
The **collective mindset** of what aging is supposed to be creates our perspective of what being old is and we become this accepting its biological expression.



Sensory experience is programmed into the CNS and subsequent perceptions reinforce what we now hold to be true.



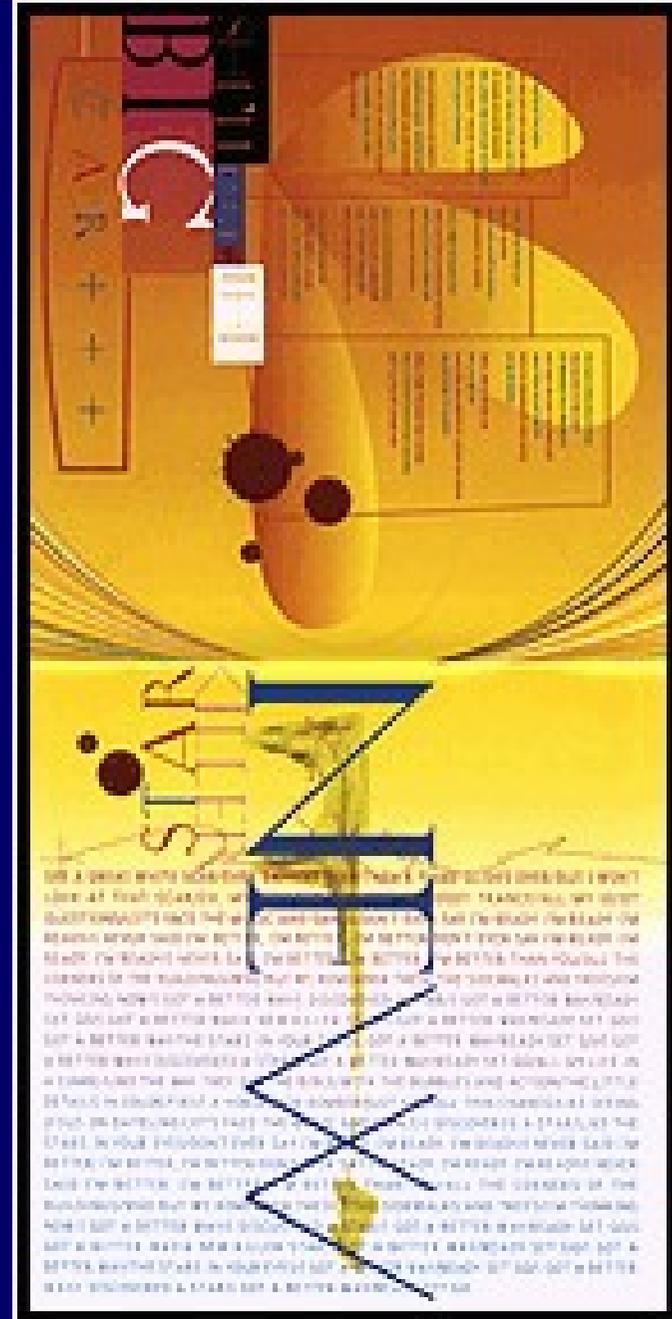
e.g. of elephant
on chain tether,
**fish divided in
tank** and cats
brought up with
horizontal and
vertical lines.



The CNS takes in **1 billionth** of stimuli that are available to it, but it only takes in those stimuli that reinforces what it thinks exists. Our sensory experience edits out everything that we don't think exists and brings in everything we think exists.

Reality = Infinite possibilities coexisting at any one time.

We can reinterpret reality because we are not the thought but the thinker of the thought.



We have **choice and to change things we should.**

a) Recognise our precognitive commitments

b) Change ourselves which changes society which ultimately produces a change in collective consciousness.

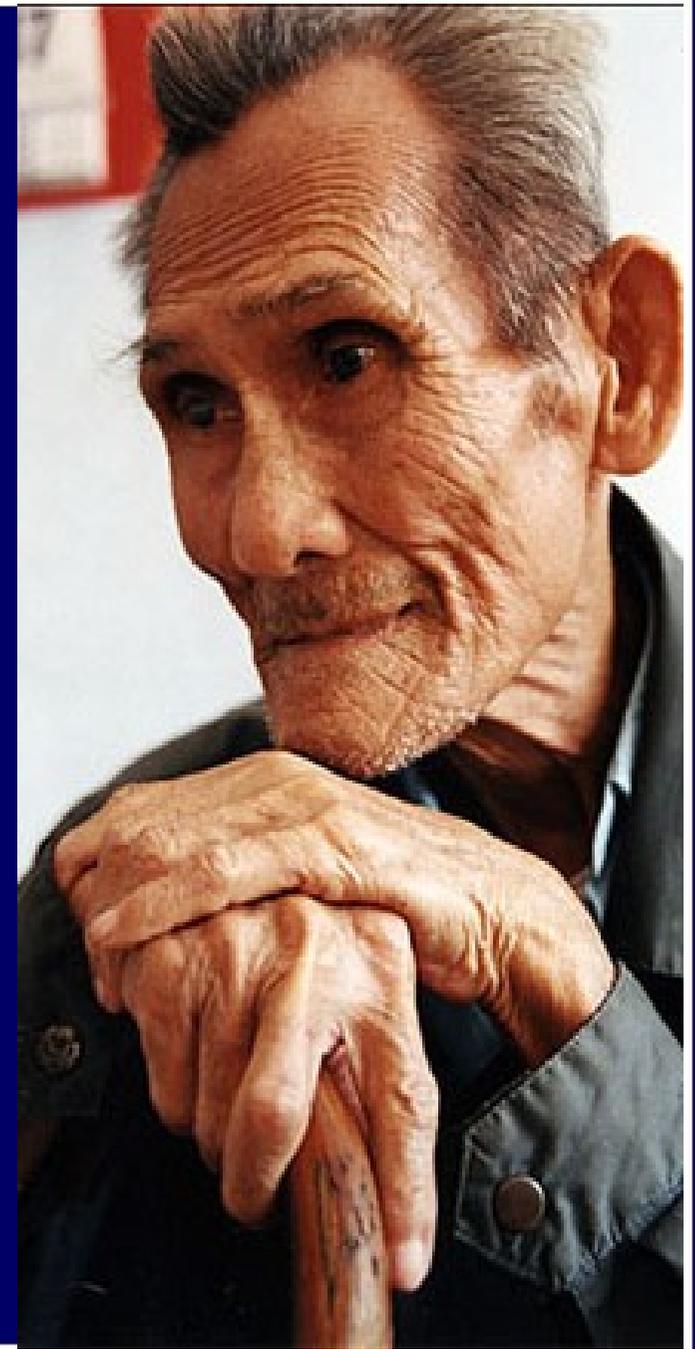
Awareness is a field of energy and information. It is the mind's faculty for having thought before thought is actually present. Retaining awareness is the mark of non aging. Giving it up in favour of habits, rituals, rigid beliefs and outworn behaviour is the mark of aging. **Life is awareness in action.**

There is an assumption that **growing old** is something that happens to people. Now we are seeing that growing old is something that social conditioning taught our bodies to do. If aging is something that is happening to you, then basically you are a victim.

But **if aging** is something you learnt, you are in a position to **unlearn** the behaviour that is making you age, adopt new beliefs and be guided into new opportunities.

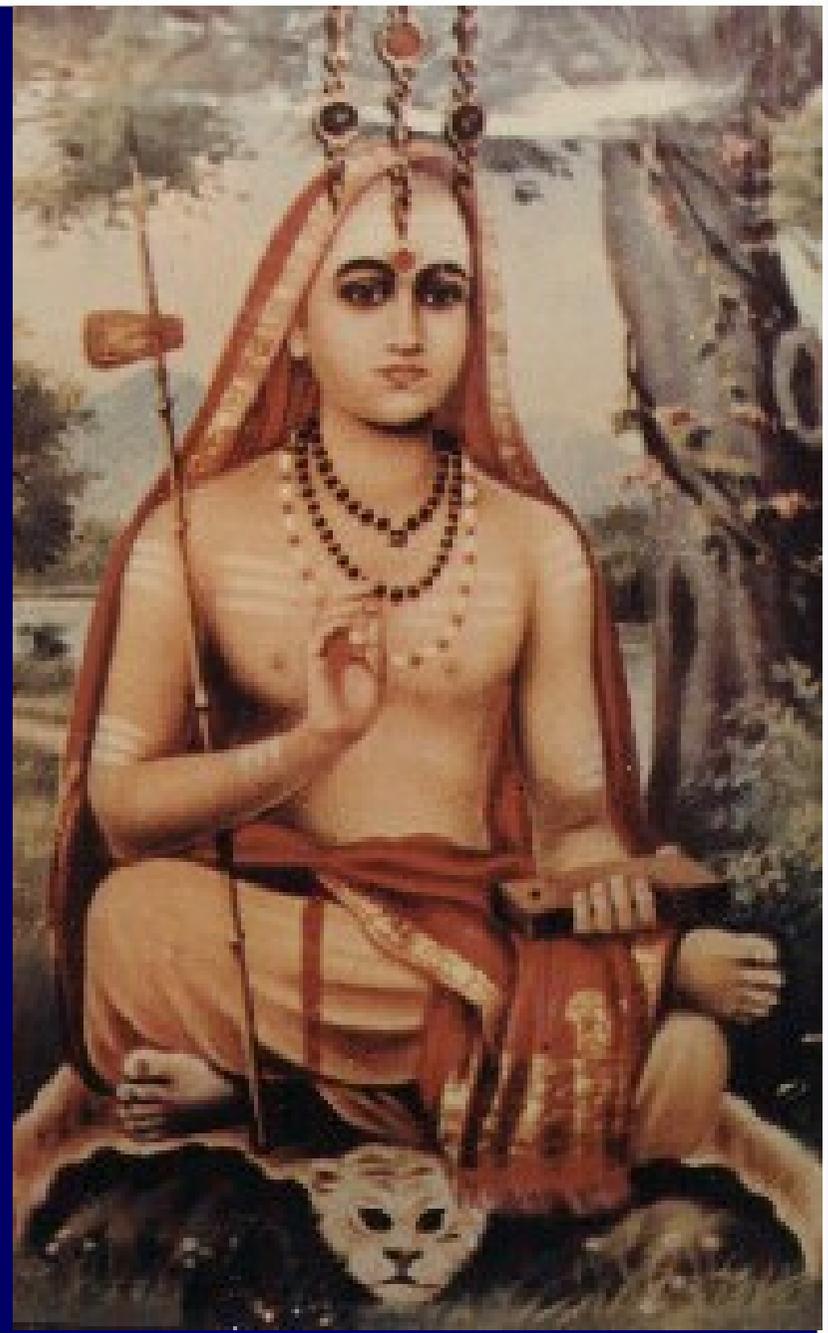


Our inherited expectation that the body must wear out over time, coupled with deep beliefs that we are fated to suffer, grow old and die, creates the biological phenomenon we call aging.



**“People grow old
and die because
they see others
grow old and die”
- Shankara**

**“Belief creates
biology” – Norman
Cousins.**



The three Ages of Man

1. *Chronological age* – how old you are by the calendar.

2. *Biological age* – how old your body is in terms of critical life signs and cellular processes.

3. *Psychological age* – how old you feel you are.

After decades of intense investigation, there is **no adequate theory of human aging. Even our attempts to explain how animals age have resulted in more than 300 separate theories, many of them contradictory.**

Most popular are Reactive Oxygen Species. Mitochondrial dysfunctioning.

Negative factors that accelerate aging.

1. Depression

2. Lack of regular daily routine

3. Lack of regular work routine

4. Job dissatisfaction

Highest risk of heart attack

5. Inability to express emotions

Positive factors that retard aging

- 1. Happy marriage or satisfying long term relationship**
- 2. Job satisfaction** **Lowest risk of heart attack**
- 3. Feeling of personal happiness**
- 4. Regular daily routine**
- 5. Regular work routine**

Larry Scherwitz taped conversation of 600 men, a third who were suffering from heart disease, the rest of whom were healthy. Listened to the tapes he counted how often each man used the words “I”, “Me” and “Mine”. He found the men who used the first person pronoun most often had the highest risk of heart trouble.

Flanders Dunbar's 1957 study on fit and healthy pre-centenarians

- 1. Responding creatively to change (the most important finding)**
- 2. Freedom from anxiety**
- 3. The continued ability to create and invent**
- 4. High levels of adaptive energy**
- 5. A capacity to integrate new things into one's existence**
- 6. Wanting to stay alive**

George Vaillant 1944 took 185 young men and monitored their health for 40 years. He found that even if someone appeared perfectly healthy in youth, he was very likely to die prematurely if he reacted poorly to stress, fell prey to depression or was psychologically unstable.

Of the men who had the best mental health, only 2 became chronically ill or died by aged 53. Of the 48 men with the poorest mental health however, 18 – almost 10x as many – were chronically ill or died by age by that age. He concluded that early aging was retarded by good mental health.

The **most formative years** for establishing these conditions were between 21 and 46, because those are the years when a person generally succeeds or fails in establishing a secure sense of self, regardless of even the most terrible childhood traumas and abuse.

Once **the seed is planted**, the results of mental health show up physically in one's 50's. Late middle age is the perilous decade because it is then that premature heart attacks, hypertension and many types of cancer first show up in great number.

Vaillant found that the aging process is learnt. People with good health teach their bodies to age well, depressed, insecure and unhappy people teach their bodies to age badly.

Stress did not make people sick, giving up their inner adaptability to stress does.

**The greatest
threat to life and
health is having
nothing to live
for.**



Friends, not family, help you live longer

By Sam Lister
Health Correspondent

PEOPLE not only get by with a little help from their friends, but they can also significantly boost their chances of living longer, research suggests.

A ten-year study of survival rates among the elderly has found that those with a network of friends were more likely to live longer than those supported by family members.

Drawing on data from the Australian Longitudinal Study of Ageing, researchers found that people aged over 70 with strong networks of friends had a 22 per cent better survival rate than those without. In contrast, close contact with children and relatives was found to have little impact on improving mortality. The au-

thors of the paper, published today in the *Journal of Epidemiology and Community Health*, suggest that friends may influence health-related behaviour, such as smoking and drinking, or seeking medical help for troubling symptoms. Friends may have important effects on mood, self esteem, and coping mechanisms in times of difficulty.

The study, based at Flinders University in Adelaide, South Australia, aimed to assess how economic, social and behavioural factors affected the health and wellbeing of people aged 70 and upwards. Almost 1,500 people were asked how much personal and phone contact they had with their social networks, including children, relatives, friends and confidants.

The Times

14th June

2005

Bernice Neugarten in 1973 life satisfaction in people 80-100 yrs

- 1. Take pleasure from daily activities.**
- 2. Regards their life as meaningful**
- 3. Feels they have achieved their major goals.**
- 4. Holds a positive self image**
- 5. Is optimistic**

A happy life is a healthy one, too

HAPPY people are healthier, research has shown.

They produce lower levels of harmful chemicals linked to stress and are less at risk of heart attacks.

Researchers from University College Hospital in London looked at more than 200 middle-aged male and female civil servants.

The scientists tested their blood throughout their day and recorded whether or not they felt happy.

Although most felt brighter during their free time, some had no moments of joy at all during the day while others were cheerful most of the time.

The study – published in the journal Proceedings of the National Academy of Sciences – found happier people had lower levels of the stress hormone cortisol. High levels have been linked to a greater risk of heart attack and even to Alzheimer's in later life.

The happy people also had lower levels of fibrinogen – a substance found in the blood which is a major predictor of heart disease.

Happy men had a lower heartbeat, although this was not the case for women.

Lead researcher Professor Andrew Steptoe said: 'It has been suspected for a few years that happier people may be healthier both mentally and physically.

'This study shows plausible biological pathways linking happiness with health.'

Daily Mail
19 April
2005

Belloc and Breslow followed the aging patterns by lifestyle questionnaires of 7000 people. After 5½ years, 371 had died. By looking back at the original responses, researchers discovered that the most important distinguishing features of those who survived was not their income, physical condition or genetic inheritance, but a handful of extremely simple lifestyle habits.

- 1. Sleeping 7-8 hours per night.**
- 2. Eating breakfast every day.**
- 3. Not eating between meals.**
- 4. Normal weight (<5% - >20%).**
- 5. Regular physical activity.**
- 6. Moderate alcohol drinking – no more than 2 drinks per day.**
- 7. Never smoking cigarettes.**

Belloc found by analysing the results that a 45 year old man who observed from 0 – 3 healthy habits could expect on average to live another **21.6 years**.

Someone who followed 6 or 7 good habits could expect to live **33 more years**.

The cumulative results were not quite as dramatic for women.

Walter Boritz – coined the term “disuse syndrome” - when a person decides to give up physical activity, he essentially invites his entire physiology to atrophy. As a result a constellation of problems appear.



- 1. Heart, arteries and other parts of CVS become more vulnerable.**
- 2. Muscle and skeleton become more fragile.**
- 3. Obesity becomes a high risk**
- 4. Depression sets in**
- 5. Signs of premature aging indicate that the body is biologically older than its calendar years.**

Half senile cases result from

- 1. Malnutrition (especially B12)**
- 2. Side effects of drugs**
- 3. Smoking**
- 4. Alcohol abuse**
- 5. Dehydration**
- 6. Depression**
- 7. Inactivity**
- 8. Hypothyroidism**

In place of the belief that your body decays with time, nurture the belief that **your body is new at every moment.**

In place of the belief that your body is a mindless machine, nurture the belief that your **body is infused with the deep intelligence of life,** whose sole purpose is to sustain you.

**What makes us
old isn't the
stress so much
as it is the
perception of
stress.**



2. Exercise

Exercise should be

a) Enjoyable

b) Regular

c) Cause no strain on your
physiology



Age should not be considered a deterrent to exercise.

Many of the biological and psychological processes of aging may be due to inactivity.

Exercise may modify the aging process.

Saltin asked 5 men, ranging in condition from extremely fit to sedentary, to remain lying in bed for 24 hours a day for 3 weeks. At the end of that time all the subjects suffered a decrease in aerobic capacity that was equal to 20 years of aging.

When each subject was allowed to stand up out of bed for 5 minutes per day, almost the entire loss of function was prevented.

They did not have to move around or in anyway use their muscles, just the exposure to **gravity**.



Evans and Rosenberg in 1965 from Tufts University found all 10 biomarkers of aging were improved by exercise regardless of age.

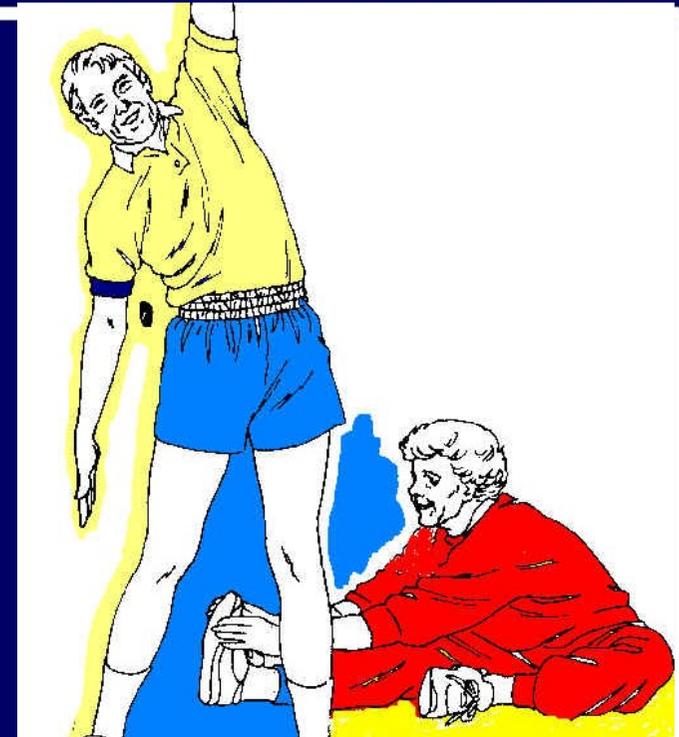
1. Muscle mass
2. Strength
3. Basal met rate
4. Body fat
5. Aerobic capacity
6. BP
7. Blood sugar tolerance
8. Cholesterol / HDL ratio
9. Bone density
10. Body temperature

Ideal exercises are

Swimming

Brisk walking

Yoga



**Jogging can cause problems
with women.**

**The optimal exercise program
involves 30 minutes 3x week.**

By 2030 20% of the population will be over 70 years. Regular exercise has been shown to increase maximum oxygen uptake, cardiac output, stroke volume, myocardial vascularization, capillary density in skeletal muscle, exercise endurance, metabolism, -----

HDL cholesterol, muscle strength, endorphin release, fibre sprouting, glucose tolerance, bone density, strength of ligaments, tendons and joints.

Physical activity lowers heart rate, blood pressure, lactate production and platelet aggregation.

3. Nutrition

Lifespan has been extended by decreased nutritional intake. Rat and mice models indicate extended life span with 50% calorie intake.

Is calories and not nutrients.

Framingham Heart Study showed increased health benefits with reduced body weight.

However statistical analysis by the **National Institutes** on aging has shown that overweight individuals survive longer. This “gain as you age” advice is only for those who are strictly healthy and does not apply to diabetics, hypertensives and CV disease individuals.

Early primate studies suggest that calorie restriction can retard some of the decline in metabolic processes associated with aging, most notably insulin resistance.

Calorie restricted humans have **lower body temperatures** and insulin levels and high levels of DHEA.

Examining participant data from the Baltimore Longitudinal Study of aging found that men in half of the above study population lived longer than men in the other half.

How does calorie restriction work

- 1. Reduces free radical and glycation reactions**
- 2. Retards aging in the CNS, reproductive and hormonal system**

Downside

Reduced ability to deal with hypothermia due to lower fat content.

Poor wound healing response.

Second Childhood

?-?

Evidence for Reduced Nutrient levels in older age

- **Reference Nutrient Intakes (RNI's) for the over 65's and over 85's and percentage of individuals in the UK receiving less than the RNI's in Non Institutionalised Individuals.**
- **Finch et al., 1998**

NUTRIENT	RNI	65 and over	85 and over
Vitamin A	700mcg	84% 	82% 
B.Carotene	900mcg	36%	36%
Thiamine	0.9mg	10.5%	21%
Riboflavin	1.2mg	30%	37%
Niacin	1.4mg	2%	7.5%
Pantothenic	6mg	84% 	93.5% 
Pyridoxine	1.15mg	20%	30%
Biotin	50mcg	95% 	99% 
Folic Acid	200mcg	38%	50%
B12	1.5mcg	3%	3.5%
Vitamin C	40mg	34%	47%
Vitamin D	10mcg	97% 	99% 
Vitamin E	15mg	92% 	97% 
Calcium	700mg	45%	53%
Magnesium	285mg	80% 	91% 
Potassium	3500mg	91% 	99% 
Iron	8.7mg	40%	45%
Zinc	8.2mg	61.5% 	68% 
Iodine	140mcg	46%	47%
Copper	1.2mg	80% 	90% 
Selenium	68mcg	NS	NS

Diet for Dementia (M. Morris combination of Mediterranean diet and the DASH diet)

- 1. 4 / 5 Leafy green vegetables**
- 2. Orange / Red fruit and
vegetables**
- 3. Berries**
- 4. Nuts especially almonds and
walnuts**
- 5. Beans and pulses**

6. Olive oil

7. Fish - oily

8. Skinless chicken (but no B12!)

**9. Whole grains – use Kamut
wheat, gluten sensitivity?**

**10. Red wine – resveratrol and
other polyphenolics.**

Summary of Nutrients to Consider for Managing Memory Loss and Dementia

- 1. Energy production**
- 2. Mitochondria regeneration**
- 3. Hypoxia**
- 4. Antioxidants**
- 5. Detoxification**
- 6. Acetylcholine synthesis**

1. Energy production

B Complex

Magnesium

alpha Lipoic Acid

Omega 3 or DHA

2. Mitochondrial regeneration

Zinc for DNA polymerase

CoQ10

Turmeric

Vitamin B12

Folates

Vitamin B6 (P-5-P)

Vitamin C

DHA, Coconut oil

Carnitine,

2. Mitochondrial regeneration

Vitamin D3

**Alpha Lipoic Acid +
AcetylCarnitine***

***Dr Bruce Ames formula**

Bruce Ames

Formula

Acetyl-L

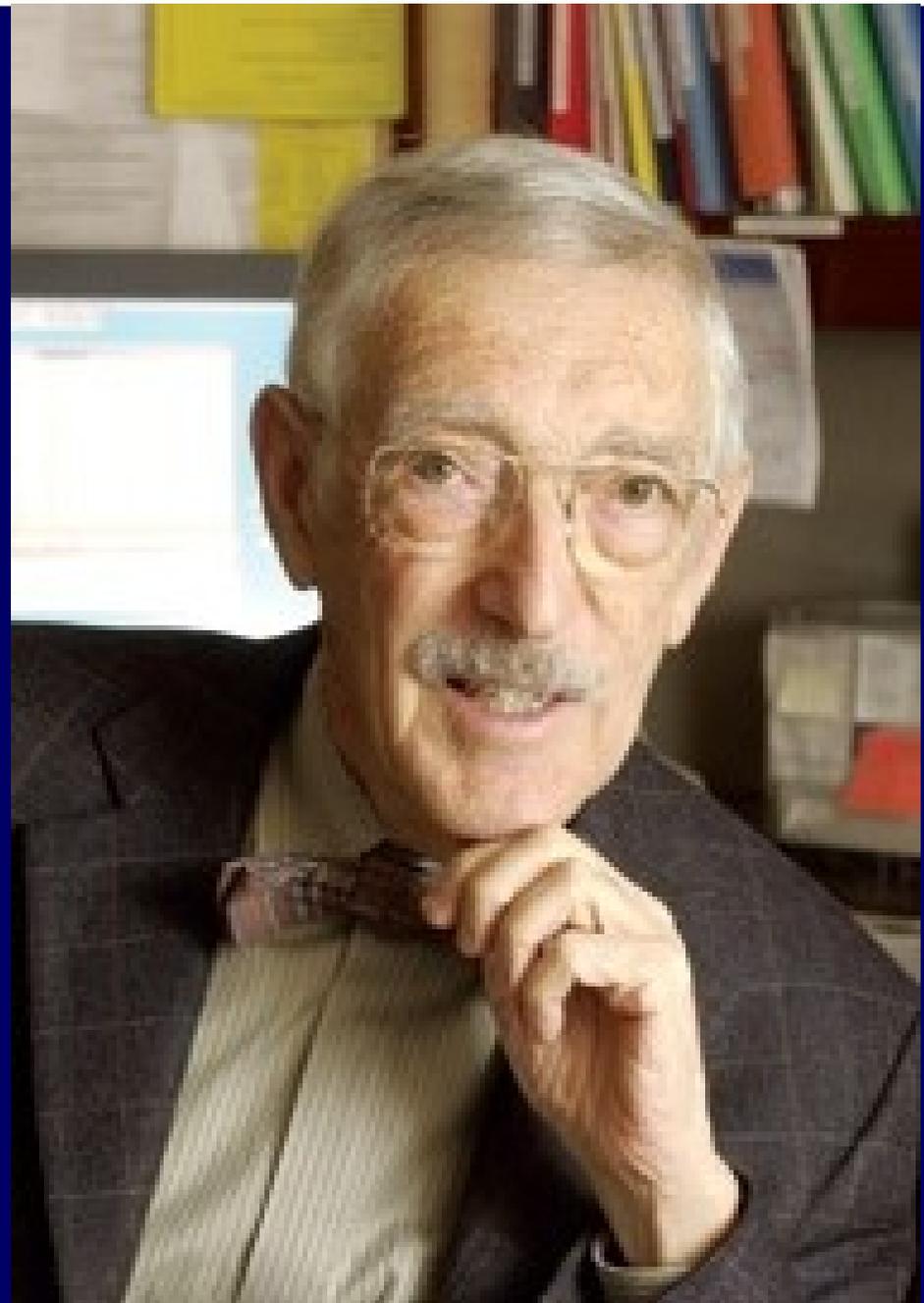
Carnitine

400mg

+

α -Lipoic acid

100mg



3. Hypoxia

DHA

Vitamin B12 (Adenosylcobalamin)

Magnesium

Zinc

Biotin

CH₂H₄Folate / H₄Biopterin

Vitamin B6 (P-5-P)

Vitamin C

Iron

4. Antioxidant Support

Turmeric

Cloves / Cinnamon

Vitamin E

Reduced Glutathione

Lutein

Ginkgo biloba

Lemon balm

Rosemary

Green tea

5. Detoxification

SAMe

Glutathione, NAC, Taurine

Turmeric

Coriander

Yarrow

Lemon balm

Black walnut tincture

Probiotics

6. Acetylcholine Synthesis

Iodine

Magnesium

B Complex

Choline or Phosphatidylcholine

Vitamin B1 (Thiamine PP)

Manganese

Zinc