

# Parenteral Hydrogen Peroxide

## A truly natural product

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# History

- Pre historic air
  - 35-50% oxygen
- Today
  - Ideally 20% oxygen
  - Realistically 10% oxygen

- **The Use of Hydrogen Peroxide decreased with the advent of prescription medications.**
- **Research diminished most likely due to non-patentable status**

# FREE RADICALS

- Our bodies create and use free radicals to destroy harmful bacterial, viruses and fungi.

Controlled and balanced through checks of  
Antioxidants vs. Oxidizing agents

# The Players

- **Oxygen radicals**

1.  $O_2^-$  (1 electron) superoxide, reduced by dismutase (SOD)



**Producing a molecule of  $H_2O_2$  and  $O_2$**



2.

$\text{H}_2\text{O}_2$  (2 electrons) hydrogen peroxide,  
reduced to  $\text{H}_2\text{O}$

By 2 enzymes: peroxisomes and  
glutathione peroxidase

### 3.

- 1)  $\text{OH}\cdot$  (3 electrons) hydroxyl radical formed only by:
  - a. radiolysis of water or rx of  $\text{H}_2\text{O}_2$  with Fe
  - i.  $\text{H}_2\text{O}_2 + \text{O}_2 = \text{OH}^- + \text{OH}\cdot$
  - ii.  $\text{H}_2\text{O}_2 + \text{Fe}^{2+} = \text{Fe}^{3+} + \text{OH}^- + \text{OH}\cdot$

Forming the last reaction of  $\text{H}_2\text{O}_2 + \text{Cl}^- + \text{H}^+ = \text{H}_2\text{O} + \text{HOCl}$  (hypochlorous acid)

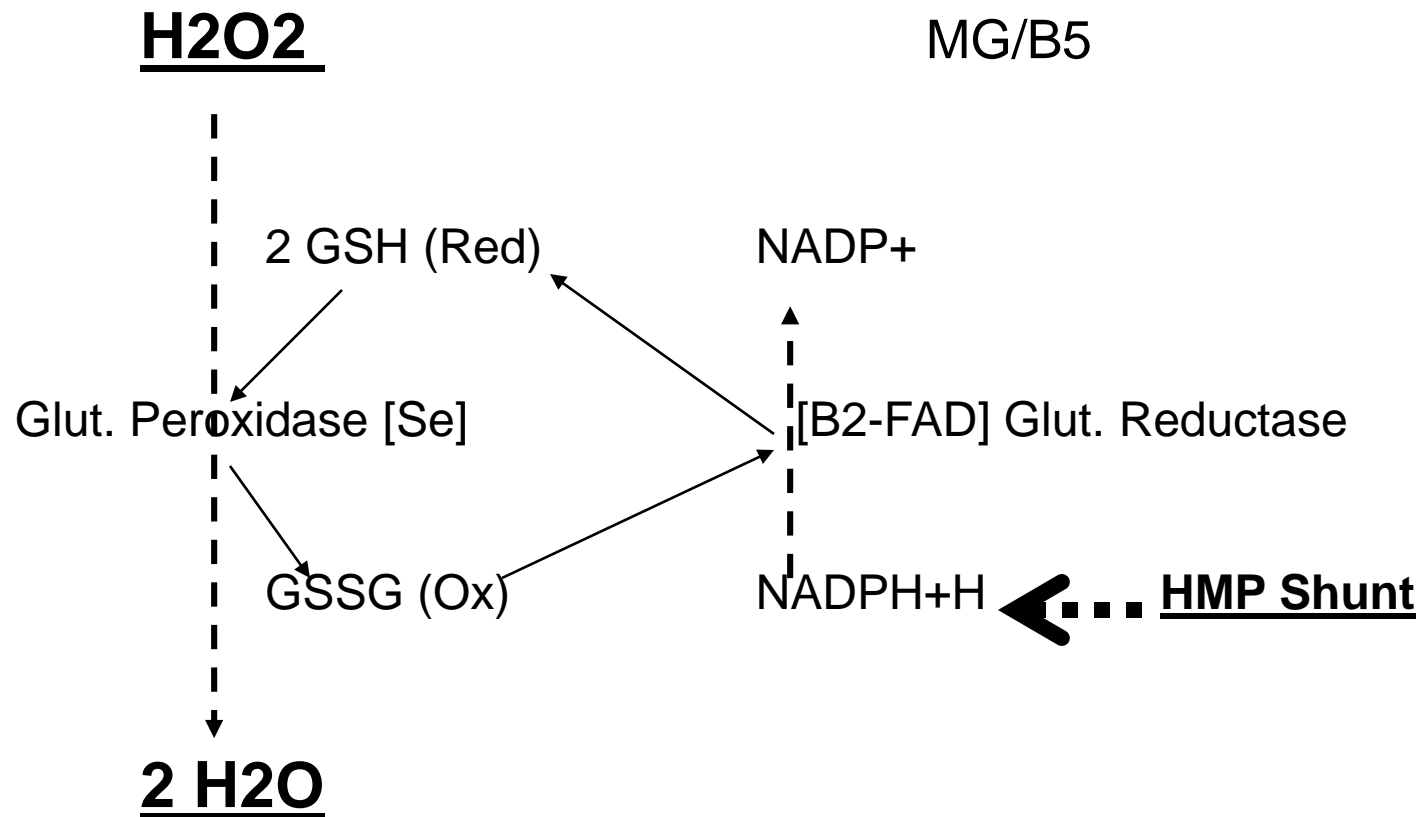


- Hydrogen Peroxide partially reduced or in excess can and will cause damage to the cell

All of these pathways are controlled by whether or not the NADPH oxidase is defective/or overactive. The production of the NADPH is inherent in the glutathione pathway

# Peroxide and Glutathione

## The Peroxide Glutathione Redox Cycle and cofactors



# Review

Found in all metabolic Pathways

- Peroxidase
- Cylooxydases
- Lipo-oxidase
- Oxidase
- Myeloperoxidase
- Catalase
- Superoxide dismutase

# REVIEW

- Oxygen destroyed through
  - Air pollution
  - Chlorination
  - Water pollution
  - Antibiotics
  - Over processing foods

Micro-molar amounts of infused  $\text{H}_2\text{O}_2$  have been found to increase oxidative enzymatic activity to the maximum rate of reaction

1. Increases glutathione oxidation to GSSG (oxidized glutathione) increasing ATP
2. Activates hexose monophosphate shunt
3. Alters Na-K ATPase activity
4. Regulates membrane transport mitochondrial and cellular
5. Regulates thermogenic control

# **Major Functions**

# Immune System

1. Polymorphonuclear leuckocytes
  - Respiratory burst through combining  $O_2$  And  $H_2O$  creating  $H_2O_2$
  - $H_2O_2$  converting to HOCL and OH
    - Phagocytosis

# Immune

## 2. Production of $H_2O_2$ from Vit C stimulates production of prostaglandins

- Clinical effects of Vit C with inflammatory reactions
  - Related to protective action against infections due to  $H_2O_2$



# High Dose IVC compared to H2O2

## High Dose IV-C

- IV → ASC – Pro-drug
- Plasma
  - ASC+Fe → H2O2
  - Some reduced by plasma catalase and GSH peroxidase
- ECF
  - ASC+Fe → H2O2
- Cell
  - Cytokine release / Immune stimulation PLUS:
    - Normal cell: H2O2 reduced by catalase
    - Abnormal cell: H2O2 → cell damage

## IV - H2O2

- IV → H2O2
- Plasma
  - H2O2 –catalase/Mn→ H2O+O2 → Plasma cytokine stimulation:
    - IL-1, IL-6, IFNa, TNF, NO
- ECF
  - No H2O2 left But Increased Cytokine cascade → Immune stimulation

# H2O2 Cytokine References:

- Siwale RC, et.al. The effect of intracellular antioxidant delivery (catalase) on hydrogen peroxide and proinflammatory cytokine synthesis: a new therapeutic horizon. Journal of Drug Targeting, Volume 17, Number 9  
[doi.org/10.3109/10611860903161328](https://doi.org/10.3109/10611860903161328)
- Zadeh. et.al. Regulation of ICAM/CD54 expression on human endothelial cells by hydrogen peroxide involves inducible NOS. J. Leukocyte Biology; 67: 327-334; 2000

# Immune

3. Lactobacillus produces  $H_2O_2$ 
  - Beneficial to colon and vaginal areas
  - Aerobic bacteria thrive in the presence of oxygen rich  $H_2O_2$
  - Anaerobic bacteria die in the presence of oxygen and  $H_2O_2$

# Immune

## 4. WBC's (granulocytes)

- Create  $\text{H}_2\text{O}_2$
- First line of defense to oxidize foreign substances
- $\text{H}_2\text{O}_2$  reacts with catalase in plasma and WBC's
  - Intercellular reactions create increase in  $\text{O}_2$  release

# Immune

## 5. $\text{H}_2\text{O}_2$

- High levels
  - Colostrum
    - highest
  - Breast milk

# Immune

## 6. $\text{H}_2\text{O}_2$ required for production of Thyroid and reproductive Hormones

- Iodination of thyroglobulin
- Regulates formation of hormones
  - Thyroxine
  - Progesterone
  - Prostaglandin
  - Inhibits: dopamine, noradrenalin and serotonin

# Immune

## 7. Improves glucose utilization of diabetics

- Increases glycogen production from glucose
- Type II diabetes stabilizes with infusions of  $\text{H}_2\text{O}_2$

# Immune

8. Through increasing oxygenation  
 $\text{H}_2\text{O}_2$  dilates the blood vessels

In reference to the heart and brain

- Aortic strip relaxation response
- Pulmonary arterial relaxation



# Immune

9. Production of interferon through natural killer cells and monocytes

10. In the presence of CO-Q-10 creates intracellular thermogenesis

11. Detoxification through oxidation of lipid material in vessel walls, reverses atherosclerosis

# **Side Effects of Hydrogen Peroxide**

The on going debate occurs with the cleaving of  $O_2$ , leaving a free radical

Free radicals (in excess) have been responsible for all types of diseases, including premature aging. These again are due to NADPH/glutathione pathways that have become defective

# Contraindications / Cautions

1. Anemia
2. Thalassemia
3. Pregnancy
4. Chronic granulomatous diseases/ membrane stability diseases
  - a. Sarcoidosis
  - b. TB
5. Know your patient: particularly with joint pain and active RA factors, this releases reactive O<sub>2</sub> intermediates, leukotrienes, prostaglandins, and H<sub>2</sub>O<sub>2</sub>

# Symptomatic Side Effects

1. Herxheimer reaction-migratory aches, nausea, occasional: headaches, mild diarrhea and chills without fever
2. Anxiety
3. Fatigue
4. Skin eruptions
5. Flu like symptoms
6. Vasculitis

# External Products

Inexpensive

Safe

Use common sense

Stay with recommended dose/sig

# 3%

- 1 pint equal to 10 pts of O<sub>2</sub>
- **Compounded only**
- Not out of the brown bottle
- Contains stabilizers
  - Not recommended for ingestion
  - Acetanilide, phenol, Na starnate, tetrasodium phos. stabilizers

# Others not for IV

- 6%
- 30% Reagent Grade
- 30-32% Electronic Grade
- 35% Technical Grade
- 90% Rocket Fuel



# 35% Food Grade

- USE INTERNALLY – THE ONLY ONE
- Food production, eggs cheese, whey and sprayed on aseptic packaging
- Requires dilution
  - Toxic
  - Fatal: Inadequate dosing and handling can bring about fatal results
- Best storage: Freezer

# **Considerations**

# IV Infusions:

## Advantages:

- Metabolic rate is significantly increased (100% during infusion)
- Dilates small arteries
- O<sub>2</sub> remained in circulation after H<sub>2</sub>O<sub>2</sub> infusion
- Increased mental alertness
- Increase in visual acuity
- Improved feeling of relaxation 24 hrs after IV H<sub>2</sub>O<sub>2</sub>
- T and B cells are increased 20-35%

## Disadvantages:

- $\text{H}_2\text{O}_2$  colitis with  $\text{H}_2\text{O}_2$  enema (3 cases)
- Thrombophlebitis at infusion site
  - Infused too rapidly
- Adding Vitamin C
- Wrong dosage
- Wrong container and solution for base

# **Hydrogen Peroxide Protocols**

- Screen Prior to Treatment
  - History
  - Physical
  - LABS:
    - Chemistry Screen
    - CBC
    - UA
    - Thyroid
    - Fasting Blood Sugar

# EQUIPMENT

- Basic Solution
  - D<sub>5</sub>W or NS (normal saline)
  - Glass Bottles/ 250cc Or B.Braun bags
  - Filtered
  - Vented Tubing

# Basic Protocol

- |  | 1 <sup>st</sup> | 2 <sup>nd</sup> | 3 <sup>rd</sup> | 4 <sup>th</sup> | 5 <sup>th</sup> | 6 <sup>th</sup> |
|--|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| • H <sub>2</sub> O <sub>2</sub> 3%   | 0.5ml           | 1               | 1.5             | 2               | 2.5             | 3               |
| – Increase <b>ONLY 0.5 cc per tx</b>   |                 |                 |                 |                 |                 |                 |
| – <b>3cc max infusion</b>  |                 |                 |                 |                 |                 |                 |
| • 5-10ml Manganese (H <sub>2</sub> O <sub>2</sub> + Mn → H <sub>2</sub> O + MnO) |                 |                 |                 |                 |                 |                 |
| • 1-5ml Magnesium Sulfate/Chloride   |                 |                 |                 |                 |                 |                 |
| • DMSO   | 1ml             | .....           |                 |                 |                 | 5ml             |
| • 2ml HCL - IVP  |                 |                 |                 |                 |                 |                 |



# Farr Triox Protocol

- Vitamin C (oxidative. High dose)
- Chelation – EDTA
- Hydrogen Peroxide
- Note: Infuse each IV on separate days

# RATE of INFUSION

- 1 ½ hours

# Other Avenues

- Oral
  - Mouth rinse of 3% for periodontal/inflammations
    - Periodontal disease/ 1.75 % as a gel (Perioprotect/bio.pro)
- Nasal/Respiratory
  - Nebulize: 3-5 gtts H<sub>2</sub>O<sub>2</sub>
    - alternating with glutathione/NAC diluted with NS
  - Sinus Inhalant: 1-3 gtts H<sub>2</sub>O<sub>2</sub> in NS
  - Vaporizer: 1oz. H<sub>2</sub>O<sub>2</sub> 35% food grade in 1 gallon of distilled H<sub>2</sub>O

- Topical
  - Clean wounds
  - Molluscum contagiosum
- Vaginal
  - Vaginitis and BV: 3 % H<sub>2</sub>O<sub>2</sub> “painted” directly on vaginal walls and cervix

# Shelf Life

- Lack of refrigeration: 1% dismutation per month
- Heat greater than 120 degrees spontaneous dismutation

# THERAPEUTIC USES

Reprinted from Hydrogen Peroxide, Medical Miracle by William Campbell Douglass, MD

# Therapeutic Uses

- “Intravenous hydrogen peroxide is a *universal treatment* because it increases oxygen available to the tissues; it has a truly remarkable range of effectiveness. Because the treatment increases oxygen availability, whether due to the direct effect of the oxygen produced by the hydrogen peroxide or the secondary manufacturing of oxygen by the body in response to the hydrogen peroxide, it is a basic treatment that can be used with almost any other therapy in almost any disease. The peroxide is always given separately and not mixed with other agents”.

# Therapeutic Uses

- The following disease conditions and infecting agents are candidates for hydrogen peroxide therapy:



# Therapeutic Uses

- Peripheral Vascular Disease
- Cerebral Vascular Disease
- Alzheimer's
- Cardiovascular Disease
- Coronary Spasm (angina)
- Cardio-conversion
- Arrhythmias
- Chronic Obstructive Pulmonary Disease
- Emphysema
- Asthma
- Influenza
- Herpes Zoster
- Herpes Simplex
- Temporal Arteritis

- Systemic Chronic Candidiasis
- Chronic Recurrent Epstein-Barr Infection
- Diabetes Type II
- HIV Infection
- Metastatic Carcinoma
- Multiple Sclerosis
- Rheumatoid Arthritis
- Acute and Chronic Viral Infections
- Chronic unresponsive Bacterial Infection
- Parasitic Infections
- Parkinsonism
- Migraine Headaches
- Cluster Headaches
- Vascular Headaches
- Chronic Pain Syndromes (multiple etiologies)
- Environmental Allergy Reactions (universal)

# **BACTERIA**

## Therapeutic Uses

- Legionella pneumophila
- Treponema pallidum
- Escherichia coli
- Salmonella typhimurium
- Mycobacterium leprae
- Staphylococcus aureus
- Pseudomonas aeruginosa
- Campylobacter jejuni
- Salmonella typhi
- Group B Streptococci
- Bacillus cereus
- Actinobacillus
- Actinomycetermoncomitans
- Bacteroides
- Neisseria gonorrhoeae

# **FUNGI**

## Therapeutic Uses

- *Histoplasma capsulatum*
- *Candida albicans*
- *Coccidioides*
- *Paraoccidioides*
- *Blastomyces*
- *Sporothrix*
- *Mucoraceae*
- *Aspergillus fumigatus*
- *Coccidioides immitis*

# **PARASITES**

## Therapeutic Uses

- *Pneumocystis carinii*
- *Plasmodium yoelii*
- *Plasmodium berghei*
- *Toxoplasma gondii*
- *Nippostrongylus brasiliensis*
- *Naegleria fowleri*
- *Leishmania major*
- *Schistosoma mansoni*
- *Chlamydia psittaci*
- *Trichomonas vaginalis*
- *Tepanosoma cruzi*
- *Endameba histolytica*

# **TUMOR TYPES**

## Therapeutic Uses

- Ehrlich carcinoma
- Neuroblastoma

# **VIRUSES**

## Therapeutic Uses

- Human Immunodeficiency Virus
- Cytomegalovirus
- Lymphocytic choriomeningitis virus
- Tacaribe virus

# How to create 3% H<sub>2</sub>O<sub>2</sub> topical and oral only

- 1 gallon of distilled water
- 12 oz of 35% food grade H<sub>2</sub>O<sub>2</sub>
- Glass container
- Refrigerate or keep in dark cool location



# How to create 10% H<sub>2</sub>O<sub>2</sub>

- 10% hydrogen peroxide is suitable for site preparation
- 25 mL total volume
  - 5 mL 35% H<sub>2</sub>O<sub>2</sub>
  - 20 mL distilled water
- 50 mL total volume
  - 10 mL 35% H<sub>2</sub>O<sub>2</sub>
  - 40 mL distilled water

# CONCLUSION

- IV hydrogen peroxide is a universal tx
- Increasing oxygen availability to tissues
- Due to direct oxygen production by  $\text{H}_2\text{O}_2$
- Secondary manufacturing by the body in response to  $\text{H}_2\text{O}_2$