

The use of ozone in medicine

Uwe Günter MD

www.biologische-orthopaedie-berlin.de

introduction

Name: Uwe Günter, MD

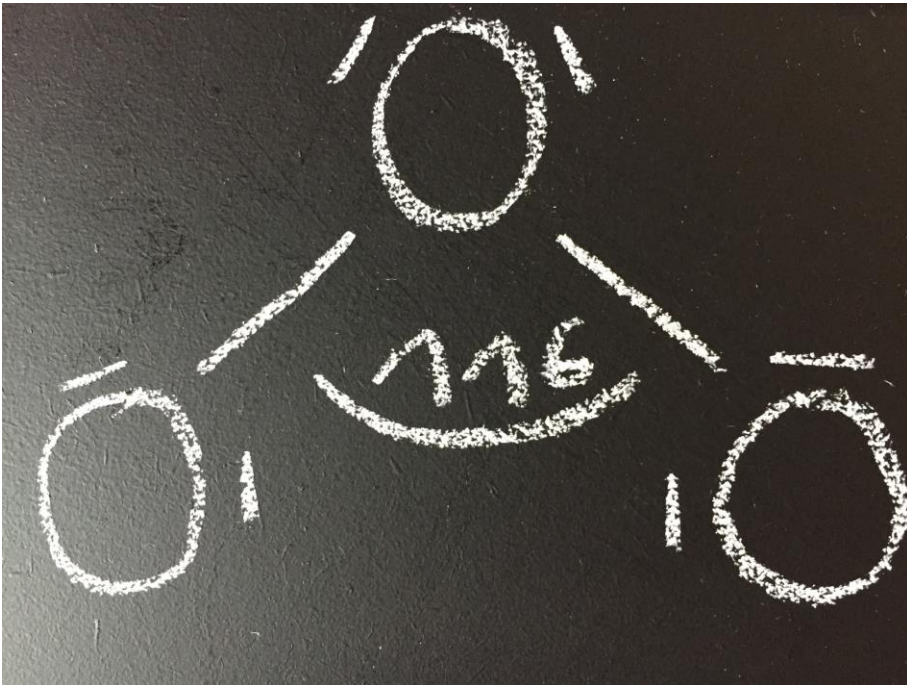
settled down since 2003

as orthopedist

main focus: neural therapy

lecturer of DGfAN

teaching how accurate inject the right
drug in the right region in the right
case (e.g. ozone in a triggerpoint,
muscle, joint or nerv)

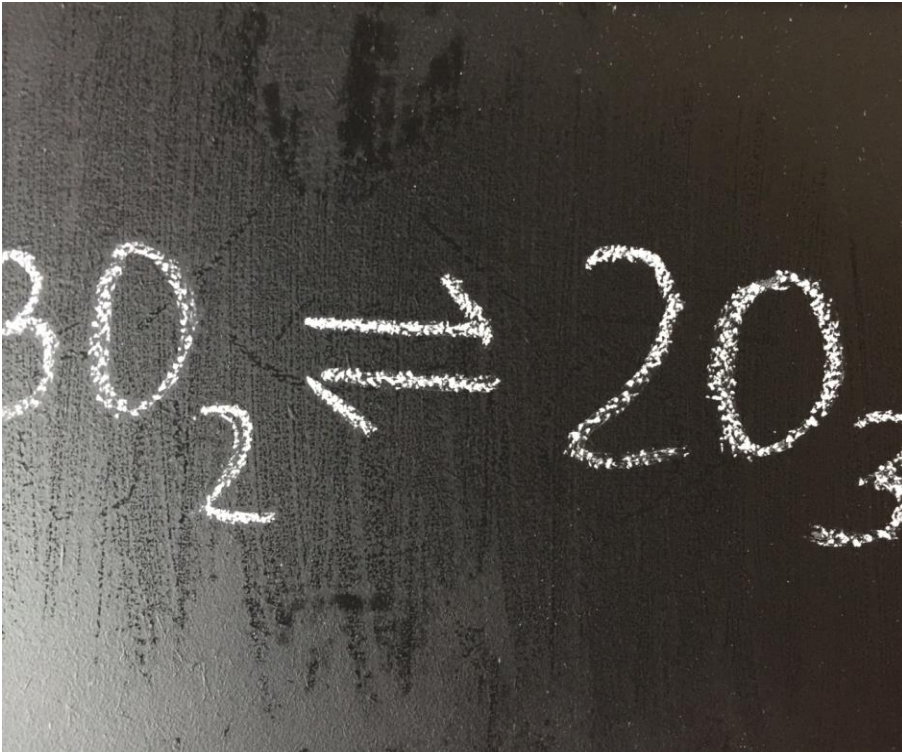


biochemistry

Ozone

- instable triatomic oxygen or powerful oxidant
- be assigned to the biological group of reactive oxygen species ROS
- an important gas in the stratosphere
- has a pronounced absorption capacity in the UV range at wavelengths between 200 and 300nm
- has also a toxic effect on the pulmonary epithelia
- in the concentration under 200 μ g/ml ozone reduce inflammation (maximum worksite concentration MAK)

effects



steady state

oxygen and ozone

in stratosphere (ozonosphere)

in tissue , cells and mitochondrion

stimulation

- growth of cells,
- interferons,
- enzymes,
- antimicrobial factors

history

- Christian Friedrich **Schönbein** discovered ozone in 1840
- Justus **von Liebig** helped him
- Werner **von Siemens** developed a generator in 1857
- A. **Wolff** treated putrescent wounds during first world war
- Erwin **Payr** presented a publication about the treatment with ozone in surgery of wounds in 1935
- The dentist E. A. **Fisch** helps him , he used a generator named CYTOZON
- Joachim **Hänsler** developed together with Hans **Wolff** a generator, who makes accurate doses of ozone/oxygen mixtures in 1957 (OZONOSAN) , both founded the medical ozone society in 1972



C. F. Schönbein 1799- 1868
Founder of Ozone



E. Payr 1871 - 1946
Medical Doctor



E. Fisch 1899-1966
Dentist



J. Hansler 1908-1981
Medical Doctor



H. Wolff 1924 - 1980
Medical Doctor

empiric ozone therapy

- A. **Wolff** treated putrescent wounds during first world war
- E. **Payr** treated himself, E. A. **Fisch** helped him, both published his experiences , but only in wounds, **Aubourg** for rectal diseases
- H. **Wolff** introduced extracorporeal blood treatment
- E. **Payr** described some indications could be applied complementary to a basic therapy in cases of rheumatism, arthritis and inflammation diseases
- **Rokitansky, Washüttl** et al published studies and investigations on immunoactivation by the agency of Ozone

historical and basical trials

- Use of ozonized water in disinfection of parodontosis (*Türk 1976*)
- Intraarticular injektion in gonarthrosis (*Fahmy 1981*)
- Ozone changes the metabolism of erythrocytes and other blood cells in vitro and in vivo (*Washüttl et al. 1986*)
- Ozone increases the production of cytokines such as interferons and interleukins 1,2 and 6 (*Bocci et al. 1990, Bocci et al. 2005*)
- Ozone activates the antioxidants and radical scavengers such as SOD, GSHPx and GSHRx (*Peralta et al. 1999*)
- Low dose ozone regulates the angiogenesis (*Barakat et al. 2004*)

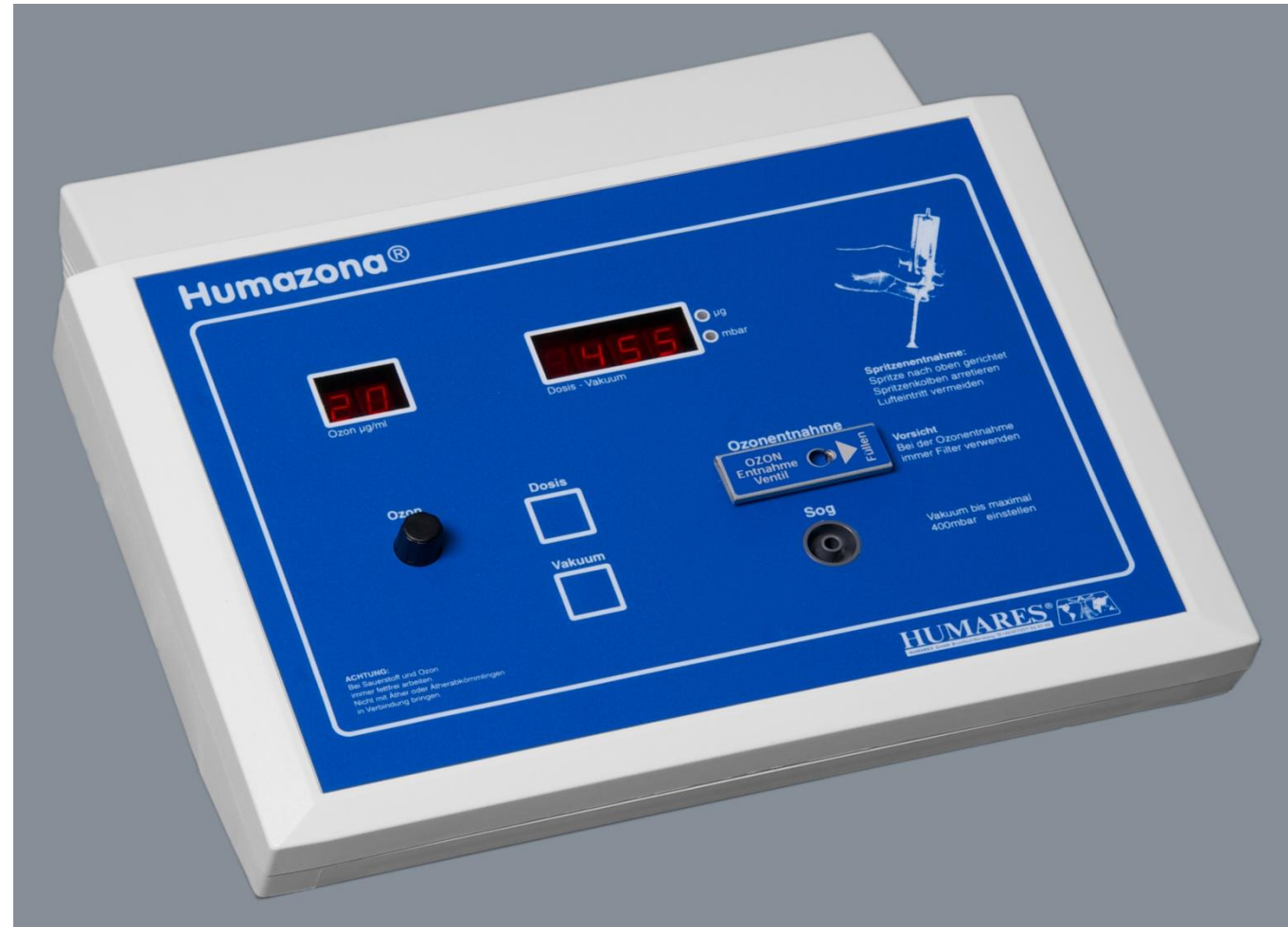
trials in rheumatism

- interactive mechanism between ozone and rheumatoid arthritis synovial fibroblast cells (*Chang JD et al. 2005*)
- intra-articular injection of O₃ at 40 µg/mL can effectively suppress the joint swelling caused by RA in rats (*Chen et al. 2013*)
- reduction of pro-inflammatory cytokines such as TNF-α and IL-1β ... and re-establishment of cellular redox balance in rats (*Vaillant JD et al. 2013*)
- Glutathione correlated with all clinical variables just after MTX+ozone. MTX+ozone increased the MTX clinical response in patients with RA (*Leon Fernandez OS et al. 2016*)

trials in back-pain and osteoarthritis

- painkilling effect of ozone-oxygen injection on osteoarthritis of the joints and spine (*Al-Jazirir AA et al. 2008*)
- combination of Ozone and HA: significantly better outcome in osteoarthritis of the knee (*Giombini A et al. 2016*)
- describe the rationale of oxygen-ozone therapy for the treatment of lumbar disk herniations (*Muto M et al. 2016*)
- efficacy of ozone concerning pain relief, functional improvement, and quality of life in patients with knee osteoarthritis (*Lope de Jesus CC et al. 2017*)

instruments



concentration - dose

- Injection in tissue like subcutis, muscles (triggerpoints) or connective tissue
 - 10µg/ml – 200-500µg
- Injection near the nerves, ganglions or arterial vessels
 - 10µg/ml – 100-200µg
- Injection in bursa and joints
 - 20-30µg/ml – 100-300µg
- Injection in indifferenc fields like scars
 - 30µg/ml – 60-150µg

preparation



needles



requirement for joint injection

spray-desinfection



disinfected room



sisosable material



gloves



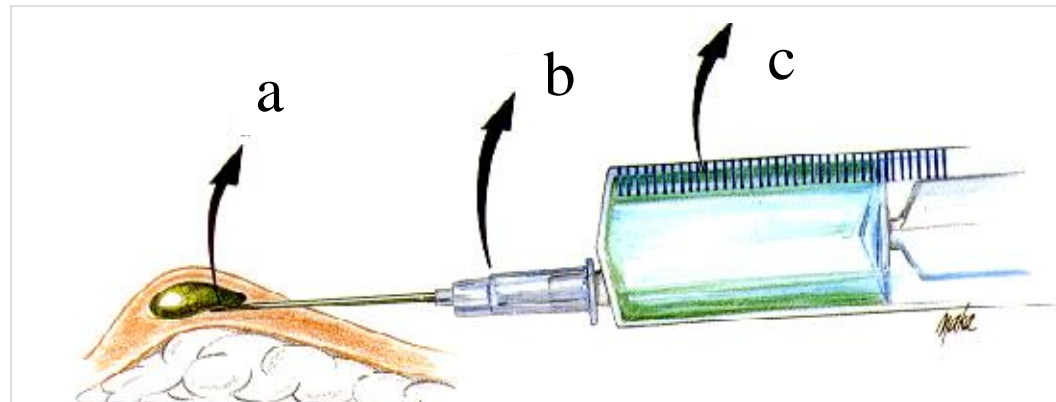
napkin (only for disconnecting)



methods and techniques

quaddels

- a** Cannula bevel should be facing up
- b** Syringe cone should be facing down
- c** Syringe scale should be facing up

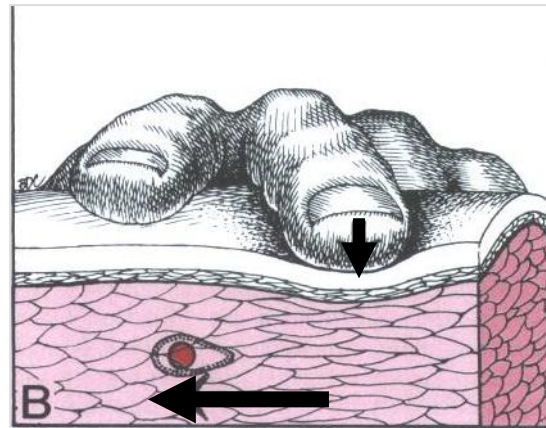
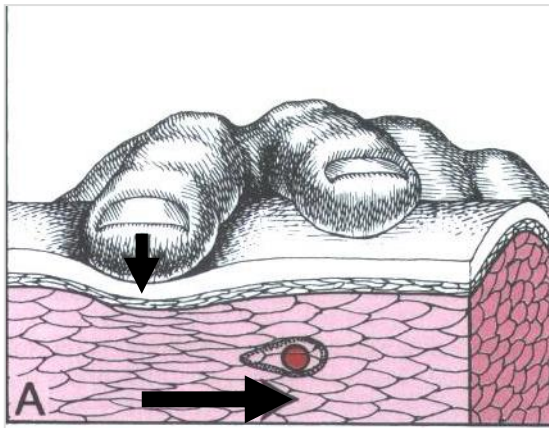


subcutaneous injektion

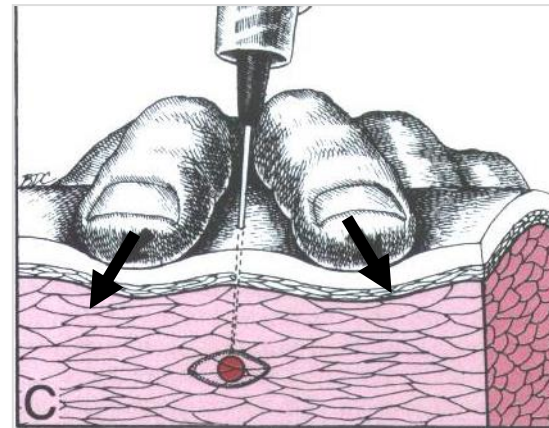


trigger point injektion

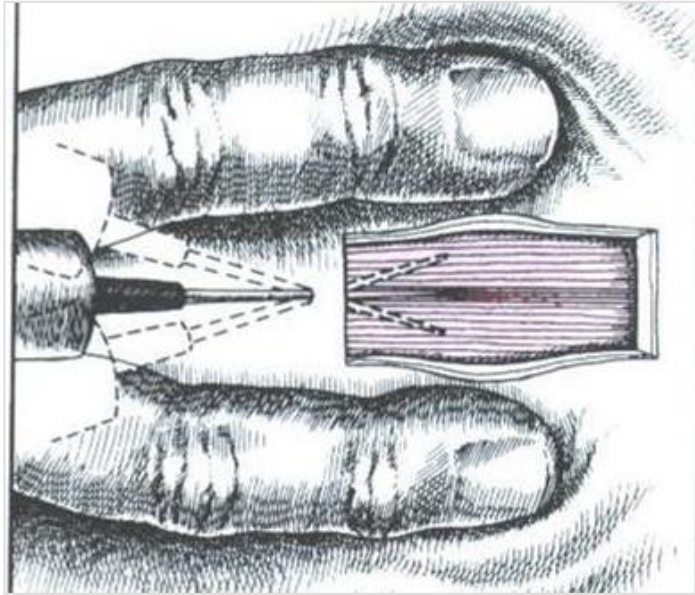
Searching for Trigger points



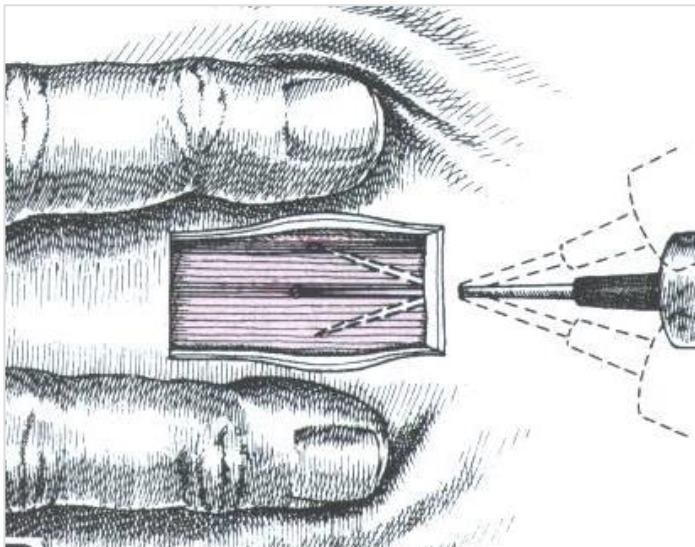
Fixating - Injecting



trigger point injektion



away from your fingers



towards your fingers

injection in bursa





injection in shoulder



injection on facet joint or near the articular nerv

in combination with procaine



injection on facet
joint or near the
articular nerv

in combination
with procaine

injection near the ganglion oticum



in combination with
procaine



injection near the ganglion stellatum

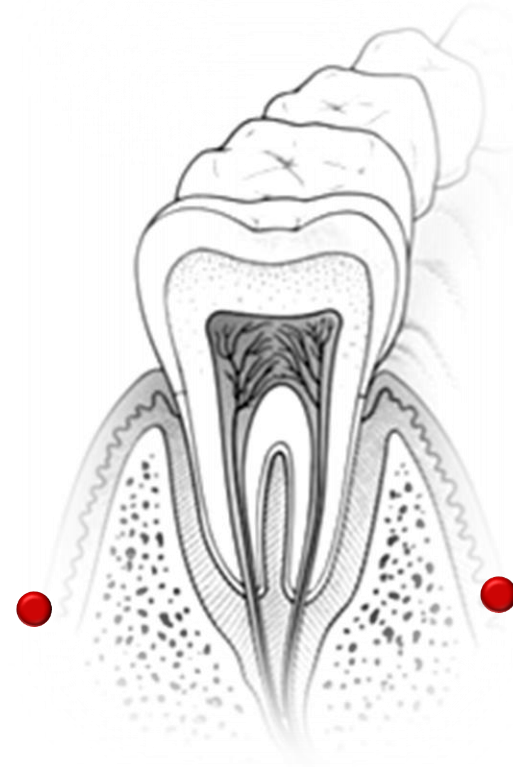
in combination with procaine



**Horner-trias on
the rihgt site**

peridental injection

buccal approach



palatine approach

future

Trials under laboratory control

- C reactive protein
- Histamin
- Tumor necrosis factor
- Interleukin
- Metabolites like mercaptanes and thioether from dentogen latent infections after stimulation by cytokins like interferones, interleukines...
- Metabolites by the oxidative and nitrosative stress like malondialdehyde, nitrotyrosin, glutathion, homocysteine, serotonin and melatonin
- Vitamin B6, B9 (folat), B12, D...

Thanks for your attention