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Wechselwirkungen von (Zahn)metallen und EMF

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Aus der Praxis: EHS

1. Beobachtung: EHS oft bei Personen, mit Zahnmetallen, metallhaltige Implantaten, oder Kieferostitis

2. Besserung bei Kiefersanierung und Entgiftungsmassnahmen bei einigen Patienten

Interaction of radio frequency electromagnetic fields and passive metallic implants--a brief review. Virtanen et al. 2006

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During the last decade, use of radio frequency (RF) applications like mobile phones and other wireless devices, has increased remarkably. This has triggered numerous studies related to possible health risks due to the exposure of RF electromagnetic (EM) fields. One safety aspect is the coupling of EM fields with active and passive implants in the human body. While interactions with active implants have been quite extensively researched, only a few studies have focused on passive implants. The present article reviews interaction mechanisms and studies of passive metallic, that is, conductive, implants in common external RF EM fields. It is found that implants have been mostly studied numerically, and experimental studies are rare. Furthermore, the studies cover mostly far-field conditions and only a few have studied implants in near fields. A summary of results indicates that a **conductive object in tissues may cause notable local enhancement of the EM field and thus enhanced power absorption**. The degree of enhancement depends, for example, on the orientation, the dimensions, the shape, and the location of the implant. However, in most of the cases, the field enhancement has not been strong enough to cause remarkable excess heating (more than 1 degrees C) of

The effect of authentic metallic implants on the SAR distribution of the head exposed to 900, 1800 and 2450 MHz dipole near field.

As the use of radiofrequency (RF) electromagnetic (EM) fields has increased along with increased use of wireless communication, the possible related health risks have also been widely discussed. One safety aspect is the interaction of medical implants and RF devices like mobile phones. In the literature, effects on active implants like pacemakers have been discussed but the studies of passive metallic (i.e. conductive) implants are rare. However, some studies have shown that the EM power absorption in tissues may be enhanced due to metallic implants. In this study, the effect of authentic passive metallic implants in the head region was examined. A half-wave dipole antenna was used as an exposure source and the specific absorption rate (SAR, W kg(-1)) in the near field was studied numerically. The idea was to model the presumably worst cases of most common implants in an accurate MRI-based phantom. As exposure frequencies GSM (900 and 1800 MHz) and UMTS (2450 MHz) regions were considered. The implants studied were skull plates, fixtures, bone plates and ear rings. **The results indicate that some of the implants, under very rare exposure conditions, may cause a notable enhancement in peak mass averaged SAR.**

Interaction of mobile phones with superficial passive metallic implants.

The dosimetry of exposure to radiofrequency (RF) electromagnetic (EM) fields of mobile phones is generally based on the specific absorption rate (SAR, W kg(-1)), which is the electromagnetic energy absorbed in the tissues per unit mass and time. In this study, numerical methods and modelling were used to estimate the effect of a passive, metallic (conducting) superficial implant on a mobile phone EM field and especially its absorption in tissues in the near field. Two basic implant models were studied: metallic pins and rings in the surface layers of the human body near the mobile phone. The aim was to find out 'the worst case scenario' with respect to energy absorption by varying different parameters such as implant location, orientation, size and adjacent tissues. Modelling and electromagnetic field calculations were carried out using commercial SEMCAD software based on the FDTD (finite difference time domain) method. The mobile phone was a 900 MHz or 1800 MHz generic phone with a quarter wave monopole antenna. A cylindrical tissue phantom models different curved sections of the human body such as limbs or a head. All the parameters studied (implant size, orientation, location, adjacent tissues and signal frequency) had a major effect on the SAR distribution and in certain cases high local EM fields arose near the implant. The SAR values increased most when the implant was on the skin and had a resonance length or diameter, i.e. about a third of the wavelength in tissues. **The local peak SAR values increased even by a factor of 400-700 due to a pin or a ring. These highest values were reached in a limited volume close to the implant surface in almost all the studied cases.** In contrast, without the implant the highest SAR values were generally reached on the skin surface. Mass averaged SAR(1 g) and SAR(10 g) values increased due to the implant even by a factor of 3 and 2, respectively. However, at typical power levels of mobile phones the enhancement is unlikely to be problematic.

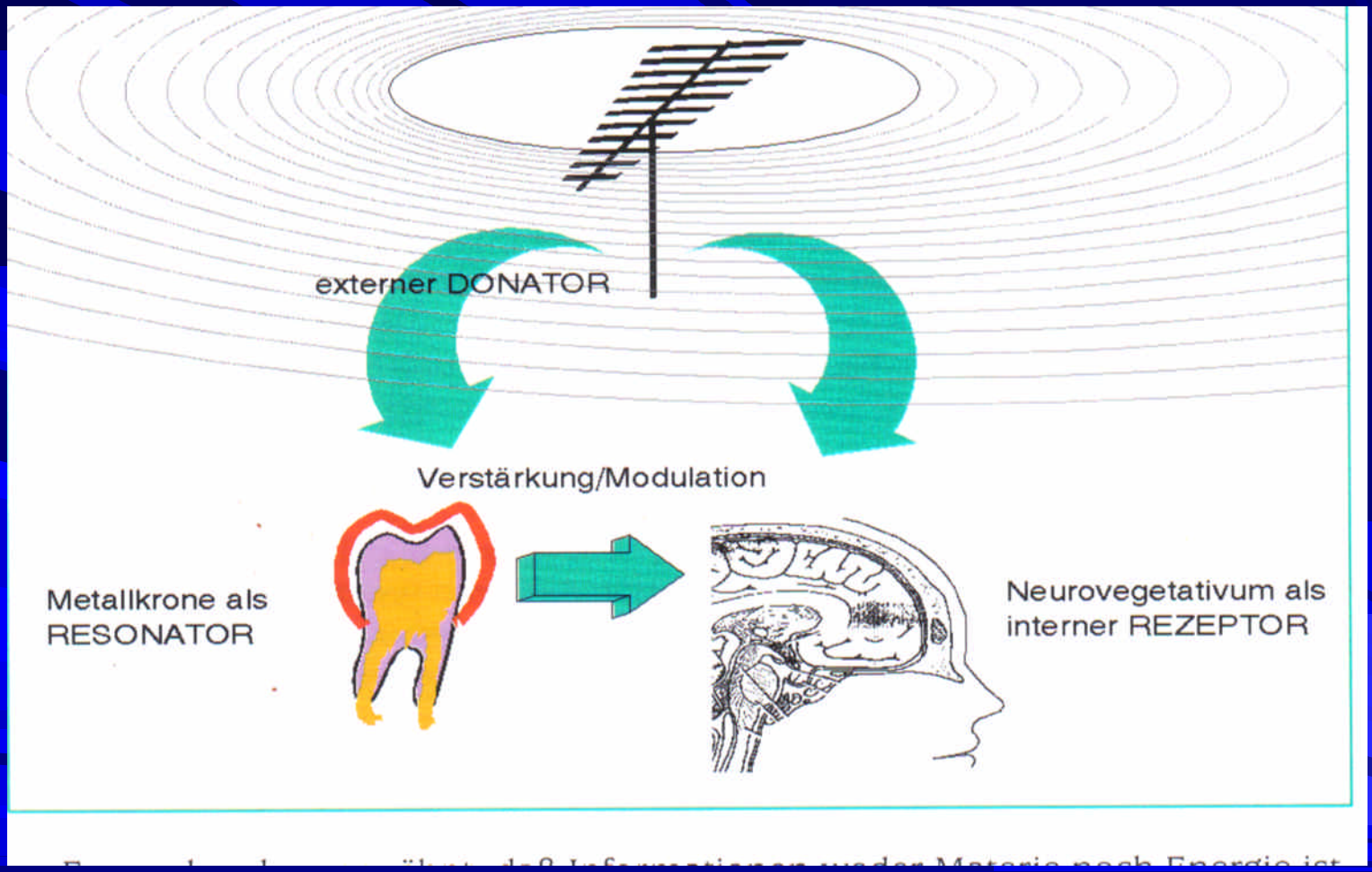
Radiofrequency dosimetry in subjects implanted with metallic straight wires: a numerical study. Mattei et al. 2008

A numerical study to investigate the effects of the exposure to electromagnetic fields (EMF) at 900 and 1800 MHz on biological tissues implanted with thin metallic structures has been carried out, using the finite difference time domain (FDTD) solution technique. **The results of the model show that the presence of a metallic wire yields to a significant increase in the local specific energy absorption rate (SAR). The present standards and/or guidelines on safe exposures of humans to EMF does not cover persons with implanted devices and thus the threshold levels to define safe exposure conditions might not apply in presence of high SAR gradients, such as the ones generated by thin metallic implanted objects.** However, exposure to EMF fields below the actual safe levels even in presence of thin conductive structures cause rather low temperature rises (1 degrees C).

Metal-framed spectacles and implants and specific absorption rate among adults and children using mobile phones at 900/1800/2100 Mhz. Joò et al 2006

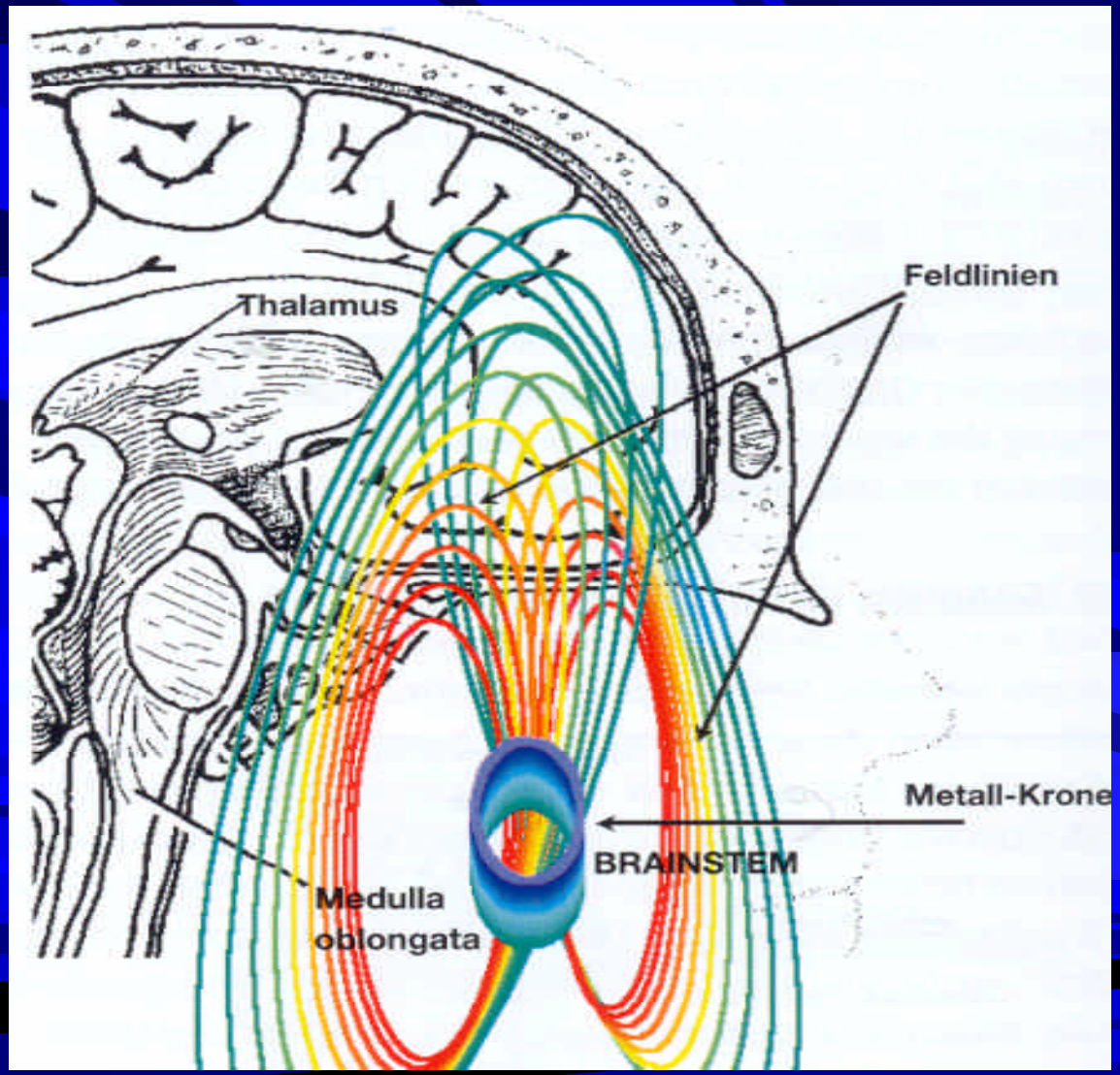
The specific absorption rate (SAR) from mobile telephones at horizontal and vertical positions is investigated in human adult and child heads wearing metal-rim spectacles and having metallic implants. The SAR values calculated by Finite Difference Time Domain (FTDT) method are compared to the actual ANSI/IEEE standards and to the 900/1800/2100 MHz electromagnetic radiation limits according to EU standards. Our calculation shows a maximum of the cellular SAR in the child head, which in the case of metallic implant could be as much as 100% higher than in the adult head. The averaging on 1 and 10 g tissue-masses shows SAR generally under the limit of 519/1999/EC standards. However, in the case of 2100 MHz with vertical position of the phone for adults and of the 900 MHz for children with metallic implants the ANSI/IEEE limits are exceeded.

Metalle als Antenne?

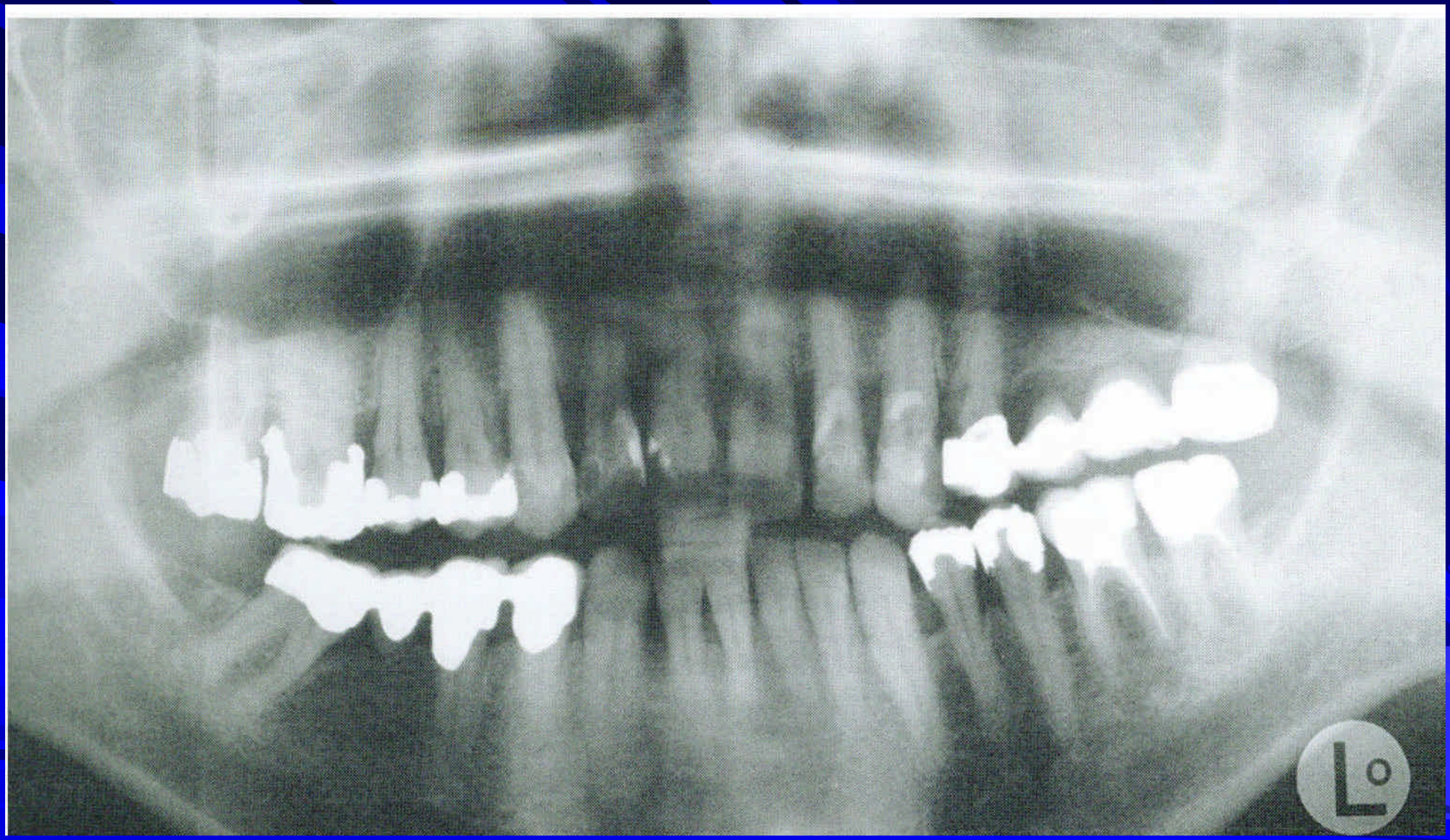


Source: Störfelder im Trigeminusbereich u. Systemerkrankungen J. Lechner

Zahnmetalle als Verstärker für EMF?
Fördert EMF die Hg- Freisetzung aus Amalgam?



Source: Störfelder im Trigeminusbereich u. Systemerkrankungen J. Lechner



Source: Störfelder im Trigeminusbereich u. Systemerkrankungen J. Lechner

1: Undersea Biomed Res. 1988 Nov;15(6):443-55. **Effects of magnetic fields from underwater electrical cutting on in vitro corrosion of dental amalgam.**

Ortendahl TW, Högstedt P, Odelius H, Norén JG.Department of Histology, Gothenburg University, Sweden.

Metallic taste has been reported from divers working with underwater electric welding and cutting. An in vitro model was designed to simulate the intraoral situation of the divers with respect to the magnetic field. Potentiostatic analyses were performed on amalgam samples exposed to AC and DC magnetic fields. Morphologic changes were analyzed using differential interference light microscopy and scanning electron microscopy. Chemical changes on the surface of the amalgam samples were analyzed with secondary ion mass spectrometry. **Results demonstrated that dental amalgams exposed to a specific AC magnetic field underwent morphologic and chemical changes in the superficial amalgam layers.**

Ortendahl TW et al. **Mercury vapor release from dental amalgam in vitro caused by magnetic fields generated by CRT's and electrical cutting procedures.** Swed Dent J 1991 p 31 Abstract 22

ABSTRACT: "People working in front of a cathode−ray tube screen (CRT) and who report they are negatively affected, sometimes complain about symptoms often related to "Oral galvanism". Methods: 5 CRT−screens were selected as sources for the magnetic field exposure. From three types of dental amalgams, representative to swedish dentistry, cylindrical amalgam specimens were prepared and were immersed in artificial saliva in an electrolytic cell. The electrolytic cells were located exactly in front of the CRT−screens with a distance amalgam − CRT−screen of 50 cm during 6 hours. The mercury vapor release (Hg0) was registered continously and were determined by a gold−foil mercury vapor analyzer (Jerome 411). **Results and Conclusion: 2 of the CRT−screens significantly increased the mercury vapor release from all three types of amalgam.**

J Pak Biol Sci. 2008 Apr 15;11(8):1142-6

Mercury release from dental amalgam restorations after magnetic resonance imaging and following mobile phone use.

„..... It appears that MRI and microwave radiation emitted from mobile phones significantly release mercury from dental amalgam restoration.“

J. Aust. Coll. Nutr. & Env. Med. Vol. 26 No.2 (August 2007) pages 3-7

ACNEM

Wireless Radiation in the Etiology and Treatment of Autism: Clinical Observations and Mechanisms

Tamara J Mariea[1] and George L Carlo[2]

„...Autismus ist eine [..] neurologische Entwicklungsstörung, die seit den späten 1970 Jahren etwa 60-fach zugenommen hat, wobei die größte Zunahme im letzten Jahrzehnt aufgetreten ist...“

<u>Ergebnisse:</u> „... Die Wirksamkeit der Schwermetallentgiftung wurde dramatisch erhöht, wenn EMF eliminiert wurde...“

<u>Schlussfolgerung:</u> „....EMF spielen eine große Rolle als Ursache von Autismus und bei therapeutischen Interventionen. EMF kann zu einem früheren Beginn der Krankheit, oder *zu einem Festhalten der in den Zellen abgelagerten Schwermetalle* führen...“

Mariea & Carlo 2007

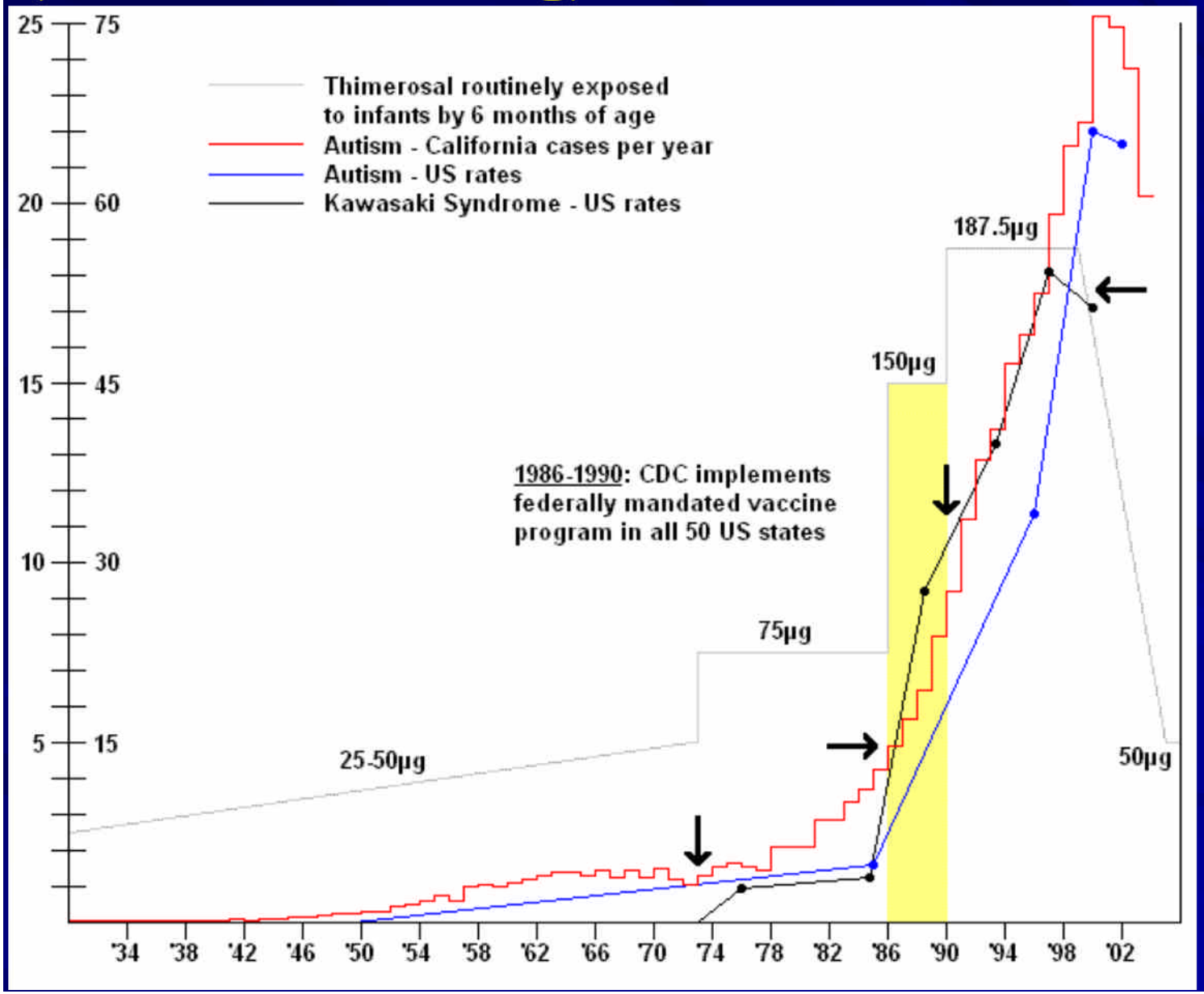
Autismus: fetale Hg-Exposition

- **In Schwangerschaft: Mütter mit mehr Amalgam / Anti-D-Infsuionen** (Geier& Geier 2007, 2008, Geier et al 2009, Holmes 2003)

- **Zeichen der Hg-Belastung** (Geier et al. 2008, Nataf 2006, Austin et al. 2008)

- **Mehr Hg im Gewebe, dagegen abnormal niedrige Hg-Werte im ersten Haarschnitt** (Adams et al. 2007, Bradstreet et al. 2003, Holmes et al. 2003, Hu et al. 2003, Kern et al. 2008)

Autismusrate nach Einführung von 10 neuen Impfungen (Quecksilberhaltig) zwischen 1986 und 2002 (USA)



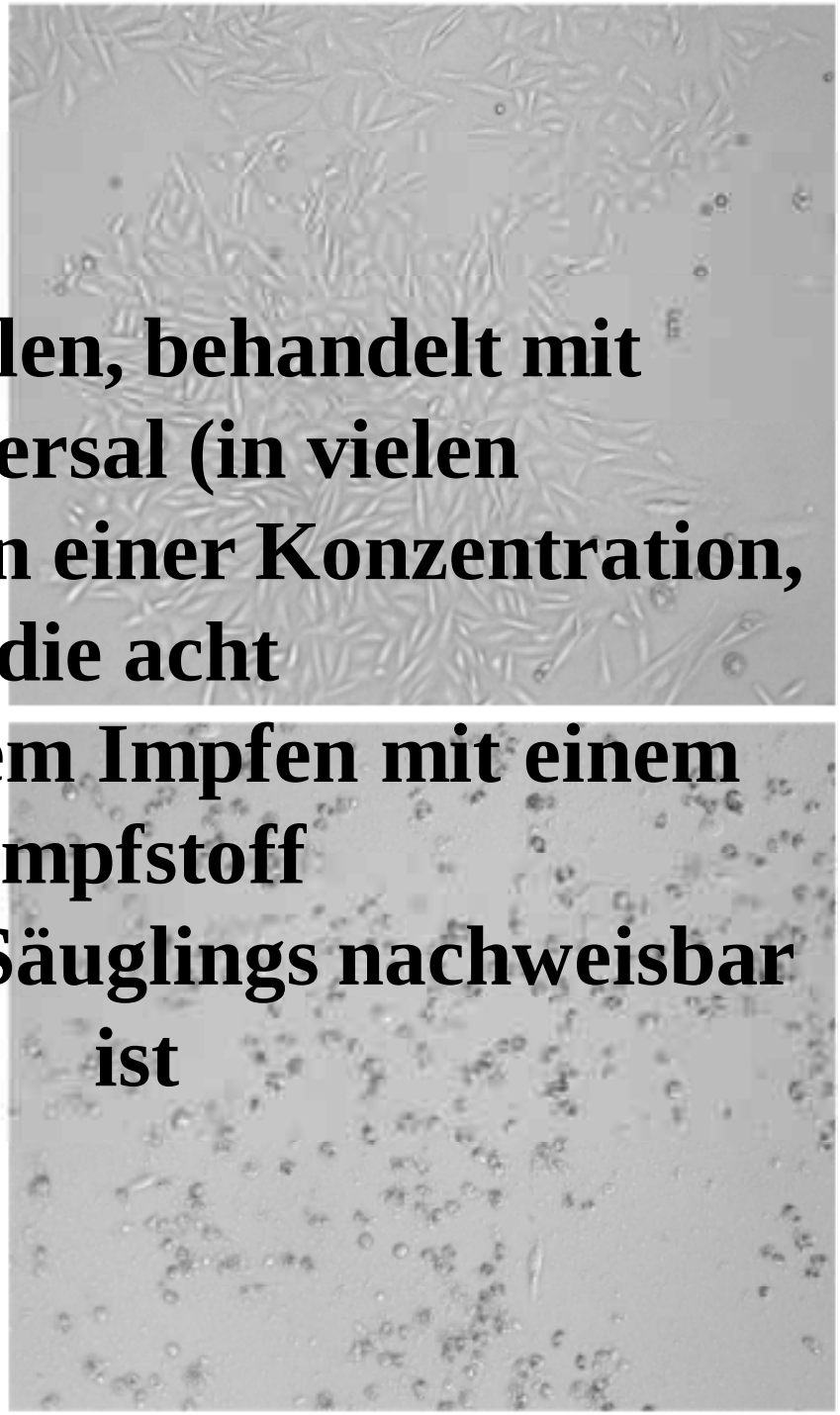
Hep B: 2x(2,6m)
HiB: 4x (2,4,6,18m)
DPT: 4x (2,4,6,18m)

Gesundheit von ungeimpften Kindern im Vergleich zu geimpften (n=11000)

2,46- fach mehr Autismus
4,17- fach mehr ADS/ADHS
2,58- fach mehr neurologische Entwicklungsstörungen

Generation Rescue, 26.6.2007: California-Oregon unvaccinated Survey. www.generationrescue.org/survey.html

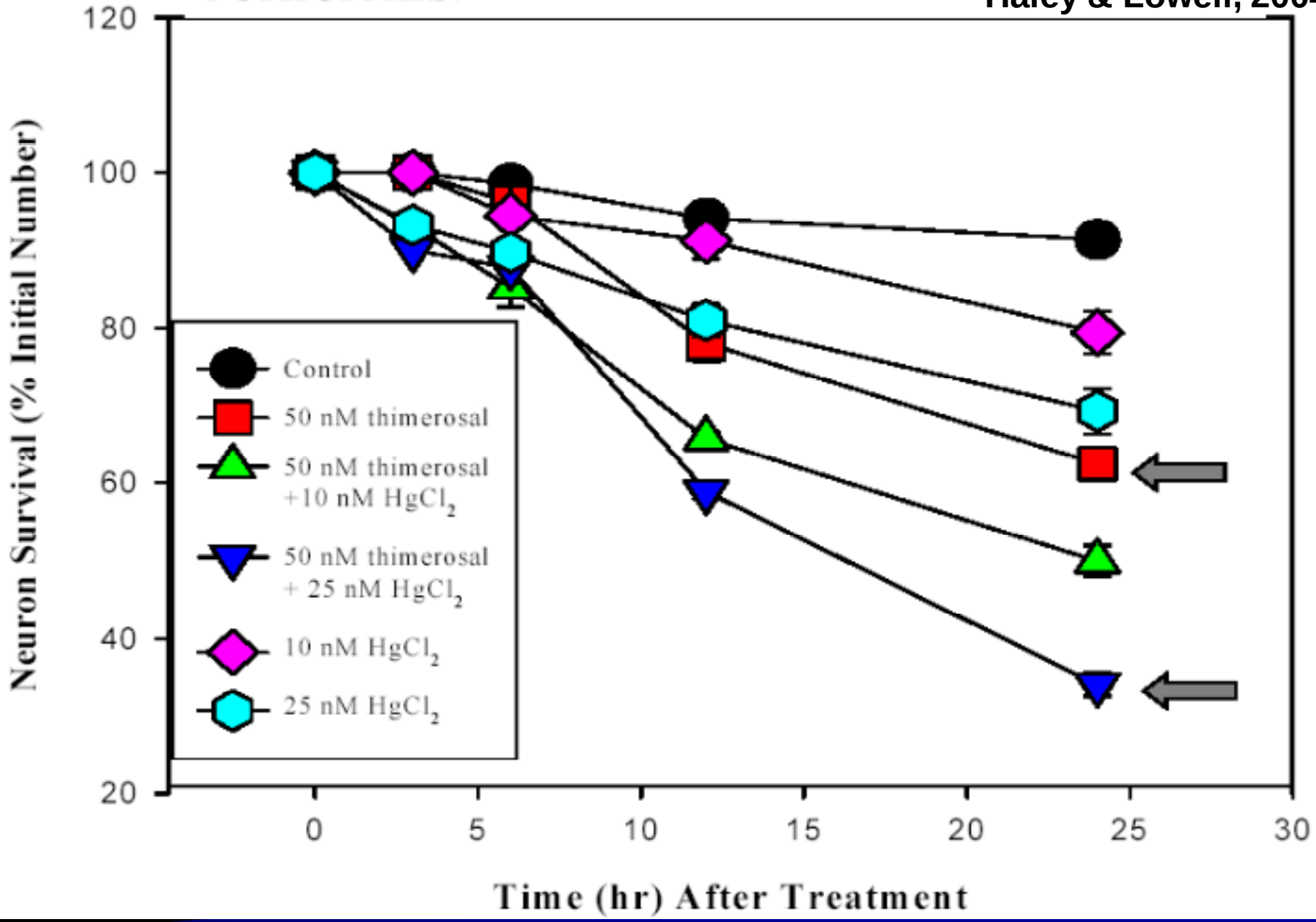
Deth, 2004

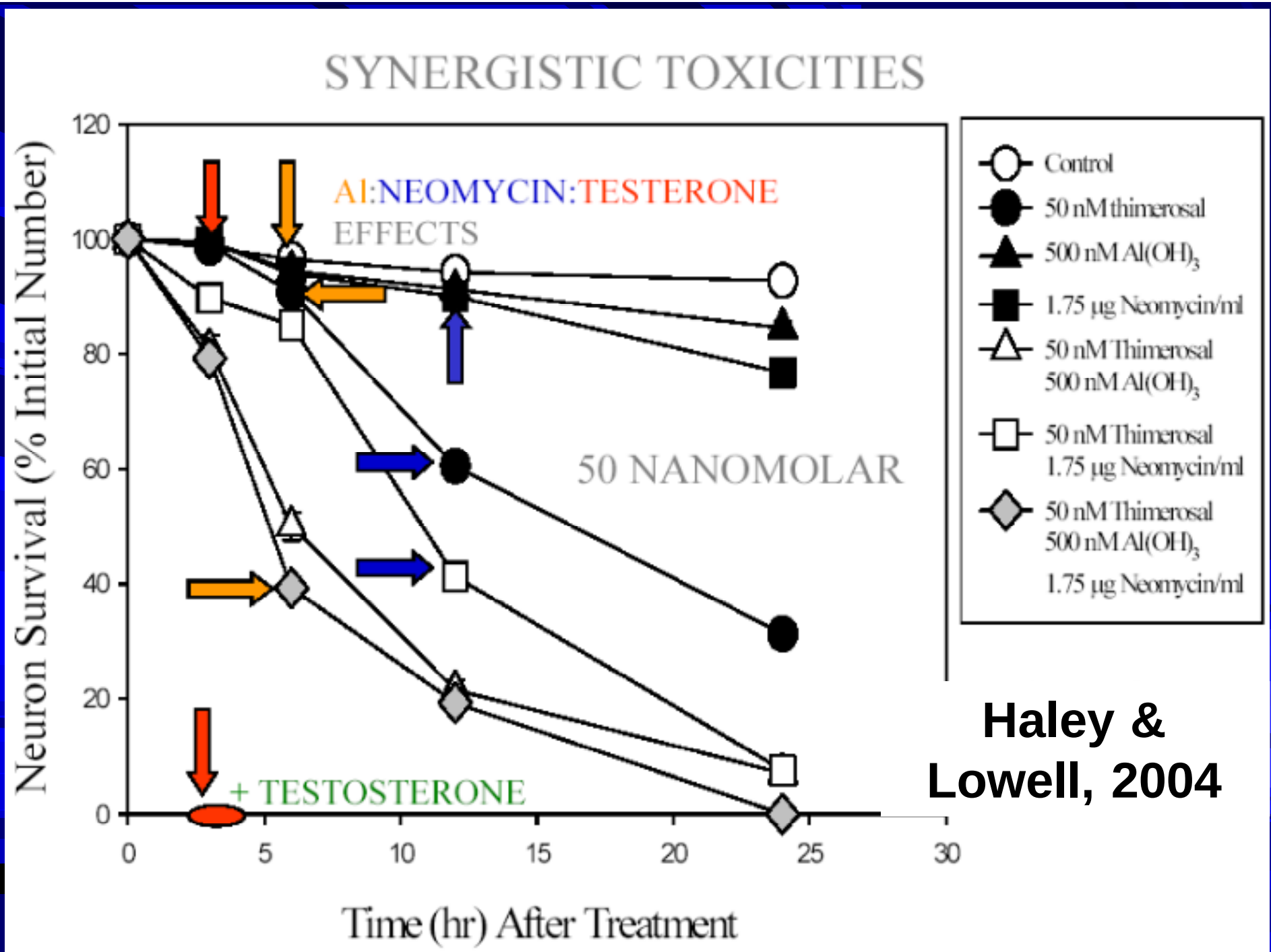


Nervenzellen, behandelt mit Thiomersal (in vielen Impfstoffen) in einer Konzentration, die acht Tage nach dem Impfen mit einem Impfstoff im Blut eines Säuglings nachweisbar ist

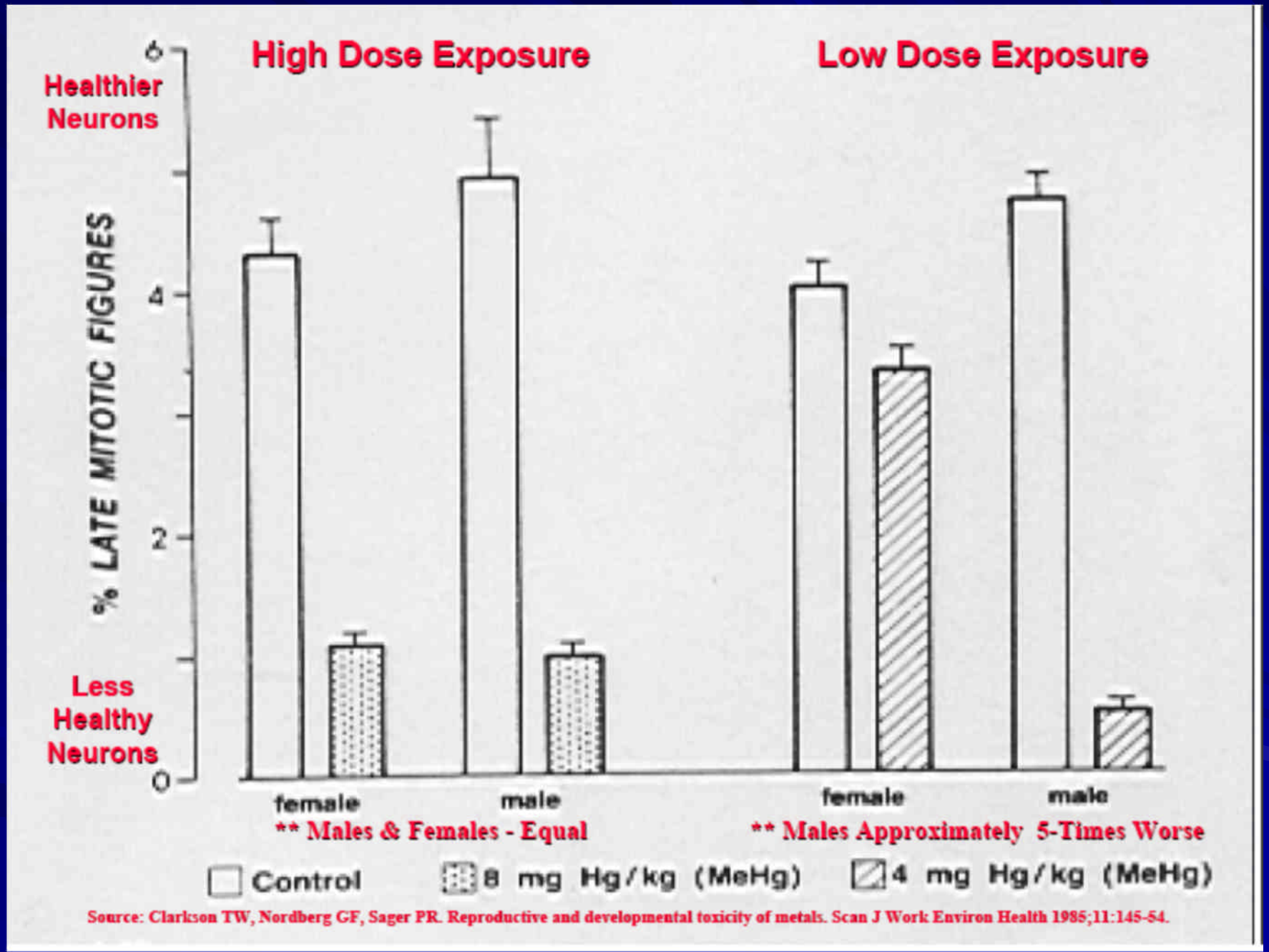
Hg & THIMEROSAL DISPLAY ADDITIVE TOXICITIES.

Haley & Lowell, 2004





Haley & Lowell, 2004



Source: Clarkson TW, Nordberg GF, Sager PR. Reproductive and developmental toxicity of metals. Scan J Work Environ Health 1985;11:145-54.

Autismus durch Hg: Weitere Indizien

- Tier und Zellversuche (Hornig et al. 2004, 2009, Geier 2008)
- USA: Amish-People (leben gesund, haben seltener Karies, lassen sich nicht impfen): Autismus praktisch nicht vorhanden!(Kennedy 2005)
- New Mexico: steigende Quecksilberwerte in der Luft gehen mit höherer Autismushäufigkeit einher (Palmer 2006, 2008)
- Beste Therapie: Etwa 70% der Autisten durch Quecksilberausleitung und Gabe von Mikronährstoffen verbesserbar! (James et al. 2004, Dietz 2004, Holmes 2003, Geier 2007, Autism Research 2009, Mutter eigener Fall)

Autismus durch Hg: Weitere Indizien II

- Coproporphyrin im Urin bei Autismus signifikant erhöht
- Coproporphyrin und Pentacarboxyporphyrin und Präcoproporhyrin im Urin nur selektiv durch Quecksilberbelastung erhöht
- Normalisierung durch Gabe von DMSA