

Back To Chiropractic CE Seminars

Healthy Families & Households ~ 6 Hours


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Back To Chiropractic CE Seminars

33000 North Highway 1

Ft Bragg CA 95437

HEALTHY FAMILIES

&

HOUSEHOLDS

KIM B. KHAUV, DC MPH

Topics to discuss:

- Endocrine disruptor: Phthalates
- Personal Care Products
- Drug-Herb-Vitamin Interactions



**ENDOCRINE
DISRUPTOR:
PHTHALATES**

Dibutyl phthalate

- **Substance name:** Dibutyl phthalate
- **CASR number:** 84-74-2
- **Molecular formula:** C₁₆H₂₂O₄
- **Synonyms:** *DBP; Di-n-Butyl Phthalate; n-Butyl phthalate; 1,2-Benzenedicarboxylic acid dibutyl ester; Phthalic acid dibutyl ester; o-benzenedicarboxylic acid, dibutyl ester; benzene-o-dicarboxylic acid di-n-butyl ester; dibutyl 1,2-benzenedicarboxylate; Benzenedicarboxylic acid, dibutylester; Dibutyl o-Phthalate*
- **Common uses:**
Dibutyl phthalate is a man-made chemical that is added to plastics and other chemicals. **In plastics it helps keep them soft (a plasticizer). It is also used in elastomers, lacquers, explosives, printing inks, resin solvents, perfume oil solvents, paper coatings, adhesives, and nail polish. It is used as a solid rocket propellant.**

Sources of emissions

- ***Point sources***

Commercial and household use and disposal of paints and varnish may release dibutyl phthalate.

Manufacturers of plastic parts and carpet backing may release dibutyl phthalate.

- ***Natural sources***

Dibutyl phthalate may occur in soils by microbial biosynthesis (manufacture by small organisms).

- ***Consumer products which may contain Dibutyl phthalate***

Consumer products containing Dibutyl phthalate may include colognes and perfumes, cosmetics, paints undercoats and primers, plastic products, floor polish, window cleaning products, caulks and sealants, latex type adhesives, resin and rubber adhesives, safety glass, vinyl floors, hairspray and nail polish.

Phthalate Plasticizers

- The two most common types used today are di-2-ethylhexyl phthalate (DEHP) and di-isononyl phthalate (DINP), which are generally used in PVC related products. **In today's market many medical delivery systems, children's toys, and baby devices are made of PVC. Recently there has been increasing debate about the danger of phthalates leaching out of the PVC and into individuals.**
- Phthalate plasticizers are colorless liquids like vegetable oil with a faint odor, and they are insoluble in water. **They are however, miscible in mineral oil, hexane, and most organic solvents. This makes them readily soluble in bodily fluids, such as plasma and saliva.**
- DEHP has been the most commonly used, and is still the plasticizer of choice for all PVC medical and surgical products. **However due to evidence of the toxicity of DEHP in laboratory animal studies it was replaced in children's products with DINP.**

- *How might I be exposed to Dibutyl phthalate?*

Dibutyl phthalate is used extensively throughout society, it is now widespread in the environment. Most people are exposed to low levels in air, water, and food. In many cases the largest source of exposure is from food containing dibutyl phthalate.

Some of the dibutyl phthalate in food is from plastics used to wrap and store the food and certain types of food (especially fish and shellfish) may absorb larger quantities of dibutyl phthalate (from 50 to 500 parts per billion).

- *By what pathways might Dibutyl phthalate enter my body?*

Dibutyl phthalate can enter the body when a person breathes air containing it, or when a person drinks water or eats food that has been contaminated with the compound. Dibutyl phthalate can enter the body through the skin, but this is very slow.

- *What effect might Dibutyl phthalate have on my health?*
- Inhalation exposure, at high levels, of dibutyl phthalate may include irritation of the eyes, nose and throat. It may cause nausea, tearing of the eyes, vomiting, dizziness, and headache. Long-term exposures may cause liver and kidney damage. **Dibutyl phthalate may harm the developing foetus and the male testes.**

New Concerns about Phthalates

Ingredients of common plastics may harm boys as they develop

Janet Raloff, Science News Sept. 2, 2000

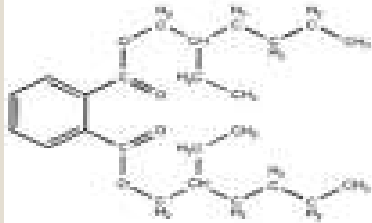
-Phthalates have become ubiquitous in modern society. Some of these oily substances find use as solvents, but most serve as softeners that make rigid materials turn flexible. **Worldwide, manufacturers produce an estimated billion pounds of phthalates annually.**
- ...several environmental and health groups and the U.S. Consumer Product Safety Commission in late 1998 **called for the manufacturers of toys, baby pacifiers, and medical supplies to remove the most toxic of these chemicals from their products.**
- At that time, **scientists had linked cancer in adults to heavy exposure to some phthalates, animal studies had indicated that phthalates can cause organ damage, and chemists had demonstrated that phthalates could leak from plastics during use.**

- The review focused exclusively on the compounds' potential for causing birth defects or reproductive abnormalities. **Over the past 3 years, animal experiments have indicated that low exposures can grossly alter the organs that in adults produce and deliver sperm.**
- The evaluators noted, however, that low phthalate concentrations show damage to animals only when the exposure takes place during some precise window of vulnerability. **This period in test animals approximately corresponds to the end of a woman's first trimester of pregnancy, a time when many women don't yet realize they're carrying a child.**

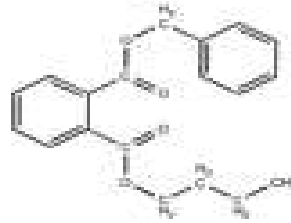


Tests by Greenpeace, an environmental group, found that this IV bag contains **39 percent** DEHP by weight. Though saline and glucose leach relatively little of this phthalate from such bags, fattier substances—such as food or blood—may leach large amounts. (Greenpeace)

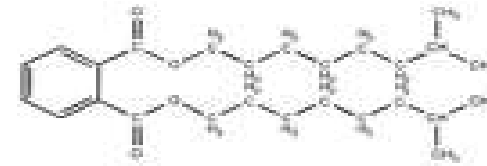
Phthalates Which Altered Reproductive Development in This Study



Diethylhexyl Phthalate (DEHP)

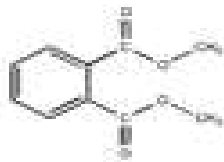


Benzybutyl Phthalate (BBP)

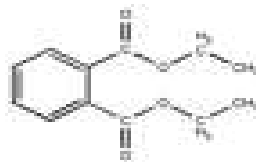


Diisononyl Phthalate (DINP)

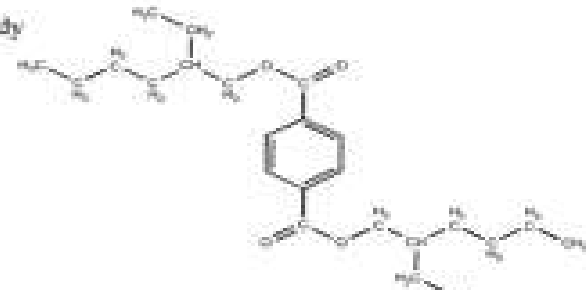
Phthalates Which Were Negative in This Study



Dimethyl Phthalate (DMP)

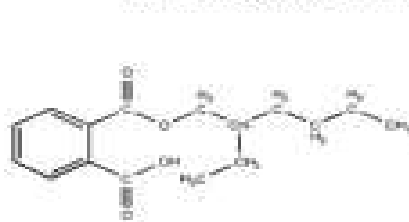


Diethyl Phthalate (DEP)

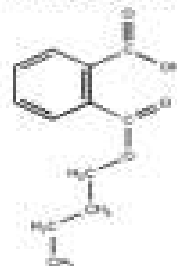


Diethyl terephthalate (DETP)

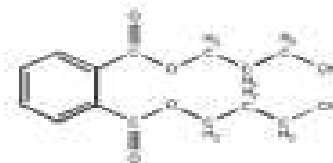
Metabolites of DEHP and BBP, and the Phthalate BBP Which Altered Development in a Previous Study



Monoethylhexyl Phthalate (MEHP)



Mono-butyl Phthalate (MBP)

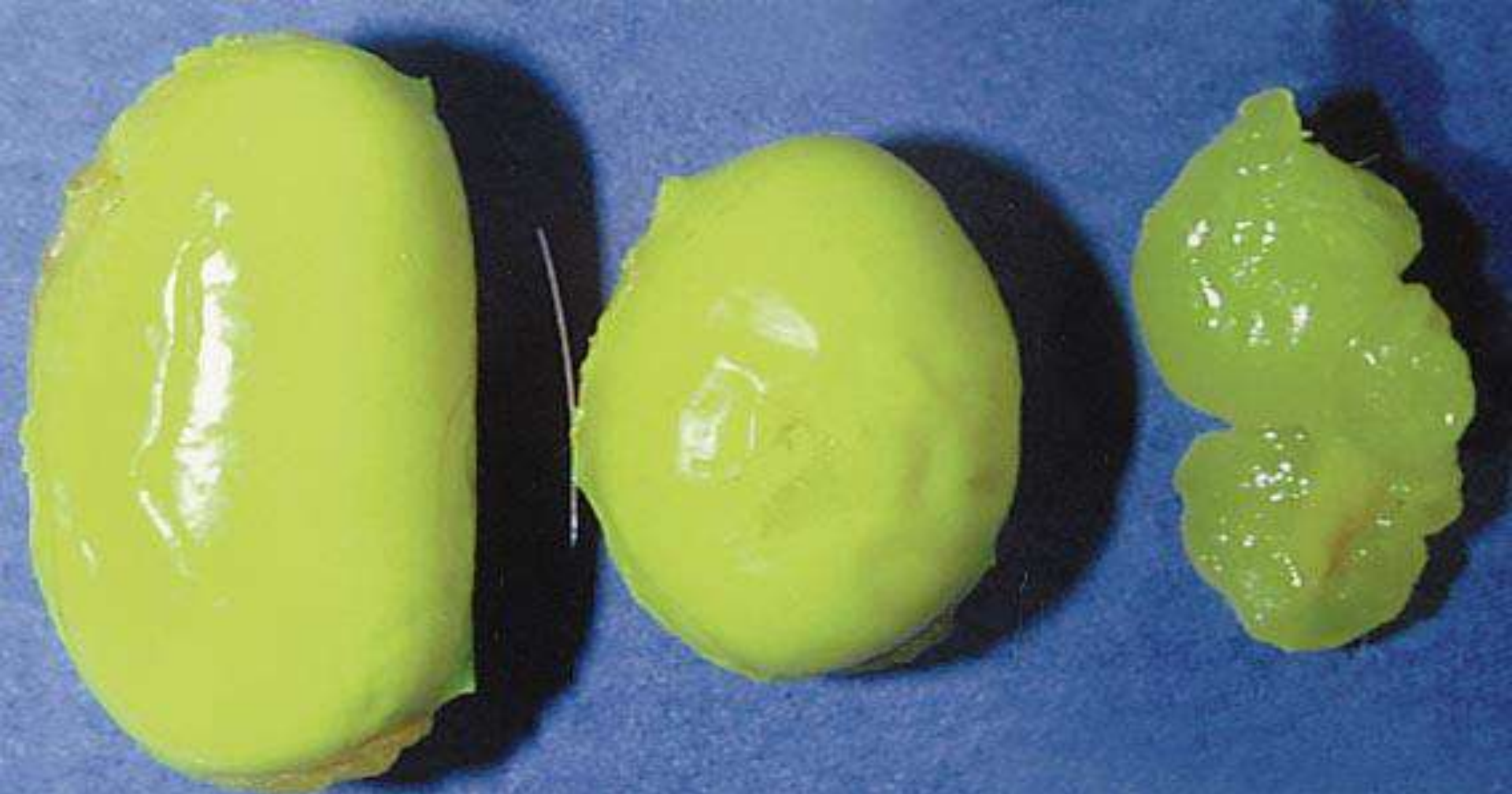


Dibutyl Phthalate (DBP)

Structure of phthalate esters which did (upper panel) or did not (middle panel) alter sexual differentiation of the male rat. Structure of dibutyl phthalate (DBP), which also alter sexual differentiation of the rat and rabbit, and the presumptive active metabolites of DBP (MBP) and DEHP (MEHP).



Epididymis (left) from an unexposed adult rat is more than three times the size of this sperm-storing organ (right) from an animal exposed to DBP in the womb.



The normal testis, left, comes from a healthy male rat. Tissues center and right come from a rat exposed to DEHP while its reproductive tract was maturing. The center tissue is a small testis filled with fluid. The corresponding tissue from the other side of the same animal exhibits no visible testis or sperm-storing epididymis. Another DEHP-exposed animal from the same set of EPA tests developed a "testis" that was nothing but a sack of blood. (Joseph Ostby / EPA)



Seminal vesicle from unexposed adult rat (left) weighs 1,700 milligrams, or more than 7 times as much as the one from the animal exposed to DEHP during development (right). Males have a pair of these pouches, which secrete fluid to carry sperm. (Joseph Ostby / EPA)

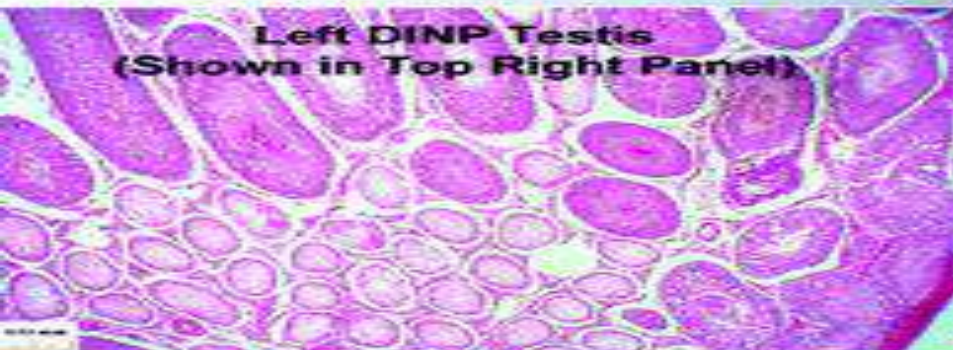
Control Testis Mean = 1753 mg
Control Epididymis Mean = 646 mg



Testes and Epididymides from Male
Exposed Perinatally to D1NP



Left D1NP Testis
(Shown in Top Right Panel)



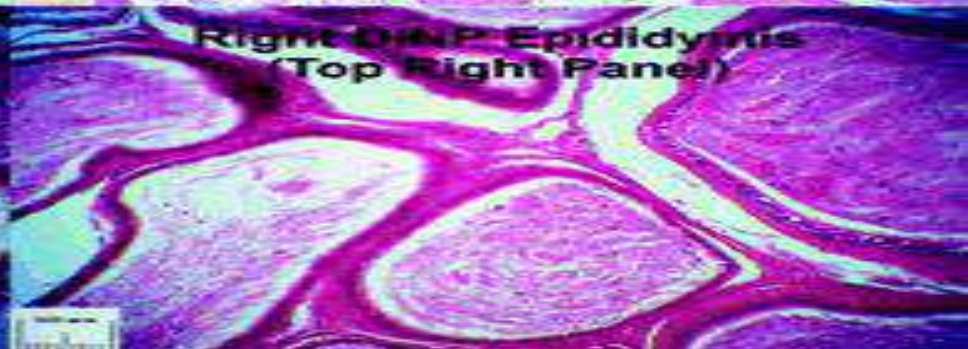
Right D1NP Testis
(Top Right Panel)



Left D1NP Epididymis
(Top Right Panel)



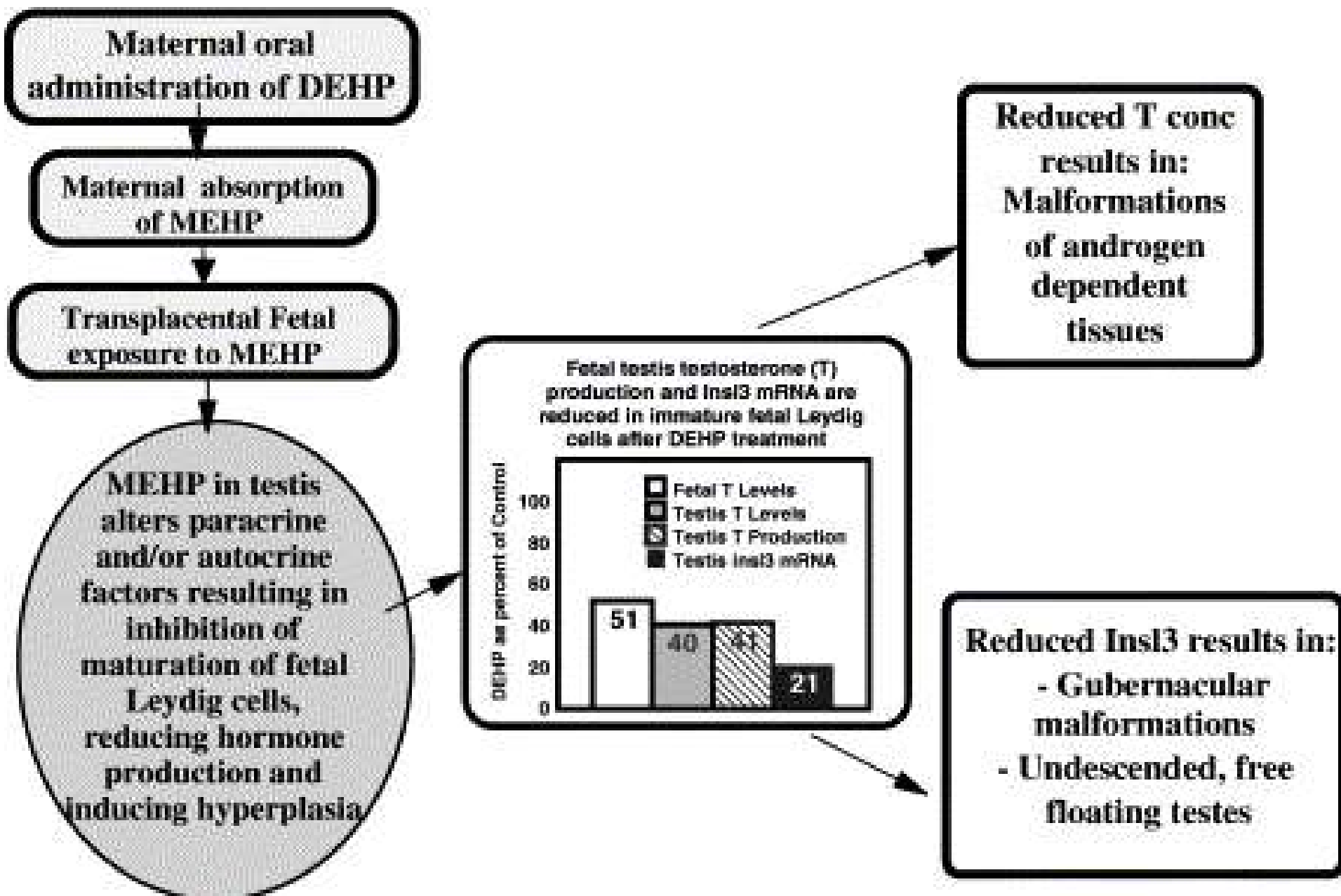
Right D1NP Epididymis
(Top Right Panel)



Photomicrographs of testicular sections of rats exposed to DEHP at 750 mg/kg/day between GD 14 and PND 3 showing the progression of the testicular lesions from PND 2 to PND 10.

- [Gray LE Jr, Ostby J, Furr J, Price M, Veeramachaneni DN, Parks L.](#)
- Toxicol Sci. 2000 Dec;58(2):350-65.

Proposed mode of action for phthalate-induced alterations of fetal testis function and male sexual differentiation.



Phthalates: In the House/Office

Phthalates, alkylphenols, pesticides, polybrominated diphenyl ethers, and other endocrine-disrupting compounds in indoor air and dust.

We sampled indoor air and dust in 120 homes, analyzing for 89 organic chemicals identified as EDCs. These are the first reported measures in residential environments for over 30 of the compounds, including several detected at the highest concentrations. The number of compounds detected per home ranged from 13 to 28 in air and from 6 to 42 in dust.

The most abundant compounds in air included phthalates (plasticizers, emulsifiers), o-phenylphenol (disinfectant), 4-nonylphenol (detergent metabolite), and 4-tert-butylphenol (adhesive) with typical concentrations in the range of 50-1500 ng/m³.

- [Rudel RA, Camann DE, Spengler JD, Korn LR, Brody JG.](#)
- Environ Sci Technol. 2003 Oct 15;37(20):4543-53.

Health complaints and annoyances after moving into a new office building: A multidisciplinary approach including analysis of questionnaires, air and house dust samples

- Abstract: Air samples and floor dust samples for analysis of organic compounds were collected in three offices. Overall the concentrations of volatile organic compounds (VOC) and formaldehyde were fairly low. However, **initially high concentrations (4300-7800mg/kg) of tris-(2-butoxyethyl)-phosphate (TBEP) and diethylhexylphthalate (DEHP: 980-3000 mg/kg) were found in dust samples.** The coating of the rubber floor was identified as the source of TBEP, while no single predominant source of DEHP was found.
- **After removal of the coating of the rubber floor throughout the whole building, a reduction up to 90% of TBEP in the dust samples was found. In spite of several attempts, no such marked reduction was achieved with the concentration of phthalates.**
- [Hutter HP](#), [Moshhammer H](#), [Wallner P](#), [Damberger B](#), [Tappler P](#), [Kundi M](#)
- INTERNATIONAL JOURNAL OF HYGIENE AND ENVIRONMENTAL HEALTH 209 (1): 65-68 JAN 2006

Phthalates in indoor dust and their association with building characteristics

Abstract: In the present study we examined associations between the concentrations of different phthalate esters in the dust from these bedrooms and various characteristics of the home. The study focused on BBzP and DEHP because these were the **phthalates** associated with health complaints. Associations have been examined using parametric and nonparametric tests as well as multiple logistic regression. **For both BBzP and DEHP, we found associations between their dust concentrations and the amount of polyvinyl chloride (PVC) used as flooring and wall material in the home.**

[Bornehag CG](#), [Lundgren B](#), [Weschler CJ](#), [Sigsgaard T](#), [Hagerhed-Engman L](#), Sundell J

◦ Source: ENVIRONMENTAL HEALTH PERSPECTIVES 113 (10): 1399-1404 OCT 2005

The association between asthma and allergic symptoms in children and phthalates in house dust: a nested case-control study.

The aim of the present study was to investigate potential associations between persistent allergic symptoms in children, which have increased markedly in developed countries over the past three decades, and the concentration of phthalates in dust collected from their homes. This investigation is a case-control study nested within a cohort of 10,852 children. From the cohort, we selected 198 cases with persistent allergic symptoms and 202 controls without allergic symptoms

This study shows that phthalates, within the range of what is normally found in indoor environments, are associated with allergic symptoms in children.

- [Bornehag CG, Sundell J, Weschler CJ, Sigsgaard T, Lundgren B, Hasselgren M, Hagerhed-Engman L.](#)
- Environ Health Perspect. 2004 Oct;112(14):1393-7.

Phthalates: Medical Equipments/Medicine



Use of Di(2-ethylhexyl) Phthalate-Containing Medical Products and Urinary Levels of Mono(2-ethylhexyl) Phthalate in Neonatal Intensive Care Unit Infants

- **Participants:** We studied 54 neonates admitted to either of two level III hospital NICUs for at least 3 days between 1 March and 30 April 2003.
- **Measurements:** *A priori*, we classified the infants' exposures to DEHP based on medical products used: ...
- **Results:** Urinary MEHP levels increased monotonically with DEHP exposure. For the low-, medium-, and high-DEHP exposure groups, median (interquartile range) MEHP levels were 4 (18), 28 (58), and 86 ng/mL (150), respectively ($p = 0.004$). After adjustment for institution and sex, urinary MEHP levels among infants in the high exposure group were 5.1 times those among infants in the low exposure group ($p = 0.03$).
- **Conclusion:** **Intensive use of DEHP-containing medical devices in NICU infants results in higher exposure to DEHP as reflected by elevated urinary levels of MEHP.**
- Ronald Green; Russ Hauser; Antonia M. Calafat; Jennifer Weuve; Ted Schettler; Steven Ringer;
- Environ Health Perspect. 2005;113(9):1222-1225. ©2005 National Institute of Environmental Health Sciences

PVC-plasticizer DEHP in medical products: do thin coatings really reduce DEHP leaching into blood?

- The levels of toxic oxidation products of DEHP generated in the blood, particularly, were found as high as in the uncoated tubing. The coatings improved the hemocompatibility, but are not safe protection against the hazardous metabolites of DEHP.
- **For pregnant women, neonates and children, we would recommend using the available surface-coated plasticized PVC tubing sets, but free of DEHP.**
- Hildenbrand SL, Lehmann HD, Wodarz R, Ziemer G, Wendel HP.
- **Perfusion. 2005 Oct;20(6):351-7.**

Health risks posed by use of Di-2-ethylhexyl phthalate (DEHP) in PVC medical devices: a critical review.

CONCLUSIONS: The observed toxicity of DEHP and availability of alternatives to many DEHP-containing PVC medical devices presents a compelling argument for moving assertively, but carefully, to the substitution of other materials for PVC in medical devices. **The substitution of other materials for PVC would have an added worker and community health benefit of reducing population exposures to DEHP**, reducing the creation of dioxin from PVC production and disposal, and reducing risks from vinyl chloride monomer exposure.

- [Tickner JA, Schettler T, Guidotti T, McCally M, Rossi M.](#)
- [Am J Ind Med. 2001 Jan;39\(1\):100-11.](#)

Decrease in the Concentration of Vitamin E in Blood and Tissues Caused by Di(2-Ethylhexyl) Phthalate, a Commonly Used Plasticizer in Blood Storage Bags and Medical Tubing

Results: A decrease in the concentration of vitamin E was observed in all cases.

Administration of vitamin E to rats and incorporation of vitamin E in the additive solution in the case of blood prevented this decrease.

Conclusion: DEHP even at very low doses caused a decrease in the concentration of vitamin E in liver and tests of rats given this substance. Blood stored in DEHP-plasticized bags also showed a decrease in the concentration of vitamin E.

- V. Manojkumar, K.G. Padmakumaran Nair, A. Santhosh, K.V. Deepadevi, P. Arun,
- *Vox Sanguinis* 1998;75:139-144 (DOI: 10.1159/000030975)

Evaluation of childhood exposure to di(2-ethylhexyl) phthalate from perfusion kits during long-term parenteral nutrition.

Leachability of the plasticizer di(2-ethylhexyl) phthalate (DEHP) from administration sets into intravenous parenteral emulsions containing fat was investigated. DEHP is added to polyvinyl chloride (PVC) to impart flexibility. However, DEHP is a lipid-soluble suspected carcinogen that is hepatotoxic and teratogenic in rodents, and has been shown to leach from PVC products containing lipophilic mixtures. Consequently, total parenteral nutrition (TPN) mixtures containing fat emulsions should be stored in ethylvinyl acetate (EVA) bags rather than PVC packs.

These results suggest that children treated with prolonged TPN are regularly exposed to significant amounts of DEHP.

- [Kambia K, Dine T, Gressier B, Bah S, Germe AF, Luyckx M, Brunet C, Michaud L, Gottrand F.](#)
- Int J Pharm. 2003 Aug 27;262(1-2):83-91.

Medications as a source of human exposure to phthalates.

One potential source of exposure is medications. The need for site-specific dosage medications has led to the use of enteric coatings that allow the release of the active ingredients into the small intestine or in the colon. **The enteric coatings generally consist of various polymers that contain plasticizers, including triethyl citrate, dibutyl sebacate, and phthalates such as diethyl phthalate (DEP) and dibutyl phthalate (DBP).** In this article we report on medications as a potential source of exposure to DBP in a man who took Asacol [active ingredient mesalamine (mesalazine)] for the treatment of ulcerative colitis. orders of magnitude lower than the no observable adverse effect level from animal studies. **Further research is necessary to determine the proportional contribution of medications, as well as personal care and consumer products, to a person's total phthalate burden.**

- [Hauser R, Duty S, Godfrey-Bailey L, Calafat AM.](#)
- Environ Health Perspect. 2004 May;112(6):751-3.

Phthalates: Women/Infants



Exposure to Di(2-ethyl hexyl)phthalate in humans during pregnancy - A preliminary report

Abstract: No significant correlations were found between maternal and cord blood DEHP, maternal and cord blood MEHP, maternal DEHP and cord blood MEHP, or maternal MEHP and cord blood DEHP plasma concentrations. **Conclusion: Although the effects of perinatal exposure to phthalates need further research, our findings: (i) confirm the high frequency of DEHP and/or MEHP exposure in human pregnancies; (ii) indicate that the exposure to these environmental contaminants begins during intrauterine life, and (iii) suggest that fetal exposure is closely related to the maternal exposure.**

- [Latini G, De Felice C, Presta G, Del Vecchio A, Paris I, Ruggieri F, Mazzeo P](#)
- BIOLOGY OF THE NEONATE 83 (1): 22-24 2003

Urinary levels of seven phthalate metabolites in the U.S. population from the National Health and Nutrition Examination Survey (NHANES) 1999-2000.

Non-Hispanic blacks had significantly higher concentrations of MEP than did Mexican Americans and non-Hispanic whites. Compared with adolescents and adults, children had significantly higher levels of MBP, MBzP, and MEHP but had significantly lower concentrations of MEP. **Females had significantly higher concentrations of MEP and MBzP than did males, but similar MEHP levels.** **Of particular interest, females of all ages had significantly higher concentrations of the reproductive toxicant MBP than did males of all ages; however, women of reproductive age (i.e., 20-39 years of age) had concentrations similar to adolescent girls and women 40 years of age.**

[Silva MJ](#), [Barr DB](#), [Reidy JA](#), [Malek NA](#), [Hodge CC](#), [Caudill SP](#), [Brock JW](#), [Needham LL](#), [Calafat AM](#).

◦ Environ Health Perspect. 2004 Mar;112(3):331-8.

Possible impact of phthalates on infant reproductive health.

Another study found a reduction of the anogenital index (AGI) in infant boys with increasing levels of MBP, MEP, monobenzyl- and mono-isobutyl phthalate in maternal urine samples during late-pregnancy. **Boys with small AGI showed a high prevalence of cryptorchidism and small genital size. Taken together these studies suggest an antivirilizing effect of phthalates in infants. Most of these findings are in line with animal observations.** However, the possible effects of MEP appear to be limited to humans. This may be due to differences in exposure routes (inhalation and dermal absorption which circumvents liver detoxification in addition to oral) and metabolism, or this association could be spurious. **As phthalates are produced as bulk chemicals worldwide, these new findings raise concern about the safety of phthalate exposure for pregnant women and infants.**

- [Løttrup G, Andersson AM, Leffers H, Mortensen GK, Toppari J, Skakkebaek NE, Main KM](#)
- Int J Androl. 2006 Feb;29(1):172-180.

Prenatal exposures to phthalates among women in New York City and Krakow, Poland.

The mean personal air concentrations of DBP, diisobutyl phthalate, and DEHP are higher in Krakow, whereas the mean personal air concentration of DEP is higher in New York. Statistically significant correlations between personal air and urinary levels were found for DEP and monoethyl phthalate ($r = 0.42$, $p < 0.05$), DBP and monobutyl phthalate ($r = 0.58$, $p < 0.01$), and BBzP and monobenzyl phthalate ($r = 0.65$, $p < 0.01$). **These results demonstrate considerable phthalate exposures during pregnancy among women in these two cohorts and indicate that inhalation is an important route of exposure.**

- [Adibi JJ](#), [Perera FP](#), [Jedrychowski W](#), [Camann DE](#), [Barr D](#), [Jacek R](#), [Whyatt RM](#).
- Environ Health Perspect. 2003 Nov;111(14):1719-22.

Human breast milk contamination with phthalates and alterations of endogenous reproductive hormones in infants three months of age

- RESULTS: All phthalate monoesters were found in breast milk with large variations [medians (minimum-maximum)]:
- **CONCLUSIONS:** Our data on reproductive hormone profiles and phthalate exposures in newborn boys are in accordance with rodent data and suggest that human Leydig cell development and function may also be vulnerable to perinatal exposure to some phthalates. Our findings are also in line with other recent human data showing incomplete virilization in infant boys exposed to phthalates prenatally.
- Main KM, Mortensen GK, Kaleva MM, Boisen KA, Damgaard IN, Chellakooty M, Schmidt IM,
- Source: ENVIRONMENTAL HEALTH PERSPECTIVES 114 (2): 270-276 FEB 2006

Identification of phthalate esters in the serum of young Puerto Rican girls with premature breast development.

- **Premature breast development (thelarche) is the growth of mammary tissue in girls younger than 8 years of age without other manifestations of puberty. Puerto Rico has the highest known incidence of premature thelarche ever reported. This study suggests a possible association between plasticizers with known estrogenic and antiandrogenic activity and the cause of premature breast development in a human female population.**
- [Colon I, Caro D, Bourdony CJ, Rosario O.](#)
- Environ Health Perspect. 2000 Sep;108(9):895-900.

Exposure of nursery school children and their parents and teachers to di-n-butylphthalate and butylbenzylphthalate.

○ **CONCLUSION: We have shown that the internal exposure to MnBP and MBzP in children is approximately two- to four-times higher than in adults. Correlation of internal MnBP with MBzP exposure points to common sources of exposure for both phthalates. DnBP exposure seems, at least in part, to be connected with the use of body/skin care products and certain medications.**

○ Koch HM, Preuss R, Drexler H, Angerer J.

○ Int Arch Occup Environ Health. 2005 Apr;78(3):223-9. Epub 2005 Mar 18.

Phthalates: Males

Altered semen quality in relation to urinary concentrations of phthalate monoester and oxidative metabolites.

[Hauser R](#), [Meeker JD](#), [Duty S](#), [Silva MJ](#), [Calafat AM](#). Harvard School of Public Health/Massachusetts General Hospital, Boston, MA 02115, USA. rhauser@hohp.harvard.edu
[Epidemiology](#). 2006 Nov;17(6):682-91.

- **METHODS:** Between January 2000 and May 2004, we recruited 463 male partners of subfertile couples who presented for semen analysis to the Massachusetts General Hospital.
- **RESULTS:** There were dose-response relationships of [monobutyl phthalate]MBP with low sperm concentration..and motility.. There was suggestive evidence of an association between the highest MBzP quartile and low sperm concentration ...
- **CONCLUSION:** The present study confirms previous results on the relationship of altered semen quality with exposure to MBP at general population levels.

A pilot study associating urinary concentrations of phthalate metabolites and semen quality.

[Wirth JJ](#), [Rossano MG](#), [Potter R](#), [Puscheck E](#), [Daly DC](#), [Paneth N](#), [Krawetz SA](#), [Protas BM](#), [Diamond MP](#). Department of Epidemiology, Michigan State University, East Lansing, Michigan, USA. [Syst Biol Reprod Med](#). 2008 May-Jun;54(3):143-54.

Urinary concentrations of several phthalate metabolites were measured in these men... Low sperm concentration was significantly associated with above median concentrations of monoethyl phthalate (MEP).. A significant trend was observed for tertiles of MEP and low sperm concentration ($p=0.05$). **Results suggest that ambient phthalate metabolite concentrations may adversely affect human semen quality.**

Role of environmental estrogens in the deterioration of male factor fertility

- **Result(s)** PCBs were detected in the seminal plasma of infertile men but not in controls, and the concentration of PEs was significantly higher in infertile men compared with controls. Ejaculate volume, sperm count, progressive motility, normal morphology, and fertilizing capacity were significantly lower in infertile men compared with controls. The highest average PCB and PE concentrations were found in urban fish eaters, followed by rural fish eaters, urban vegetarians, and rural vegetarians. The total motile sperm counts in infertile men were inversely proportional to their xenoestrogen concentrations and were significantly lower than those in the respective controls.
- **Conclusion(s)** **PCBs and PEs may be instrumental in the deterioration of semen quality in infertile men without an obvious etiology.**
- **Roya Rozati M.D. ^a, P. P. Reddy Ph.D. ^b, P. Reddanna Ph.D. ^c and Rubina Mujtaba Ph.D. ^a**
Fertility and Sterility Volume 78, Issue 6, December 2002, Pages 1187-1194

Phthalates: Human Development

Decrease in Anogenital Distance among Male Infants with Prenatal Phthalate Exposure

Shanna H. Swan,¹ Katharina M. Main,² [*Environmental Health Perspectives* Volume 113, Number 8, August 2005](#)

The age-adjusted AGI decreased significantly with increasing phthalate score (p -value for slope = 0.009) . The associations between male genital development and phthalate exposure seen here are consistent with the phthalate-related syndrome of incomplete virilization that has been reported in prenatally exposed rodents. The median concentrations of phthalate metabolites that are associated with short AGI and incomplete testicular descent are below those found in one-quarter of the female population of the United States, based on a nationwide sample.

These data support the hypothesis that prenatal phthalate exposure at environmental levels can adversely affect male reproductive development in humans.

Formation of estrogenic products from environmental phthalate esters under light exposure.

Phthalate esters (PEs) have been suspected to be environmental endocrine disruptors and the detailed mechanism remains unclear. The activities of these chemicals can be enhanced through chemical modification under the environmental conditions. We demonstrate that PEs acquire unequivocal estrogenic activity by light exposure.

- [Okamoto Y, Hayashi T, Toda C, Ueda K, Hashizume K, Itoh K, Nishikawa JI, Nishihara T, Kojima N.](#)
- Chemosphere. 2006 Feb 6;

Which means sunscreens containing Phthalates exposed to sunlight leads to estrogenic activities.



Phthalate exposure and human semen parameters.

- **BACKGROUND:** Specific gravity-adjusted phthalate metabolite levels were categorized into tertiles. **RESULTS:** **There was a dose-response relation between tertiles of mono-butyl phthalate and sperm motility**
- **CONCLUSIONS:** **There were dose-response relations for monobutyl phthalate and monobenzyl phthalate with one or more semen parameters, and suggestive evidence for monomethyl phthalate with sperm morphology.**

Duty SM, Silva MJ, Barr DB, Brock JW, Ryan L, Chen Z, Herrick RF, Christiani DC, Hauser R.

- Epidemiology. 2003 May;14(3):269-77.

The relationship between environmental exposures to phthalates and DNA damage in human sperm using the neutral comet assay.

One hundred sixty-eight subjects recruited from the Massachusetts General Hospital Andrology Laboratory provided a semen and a urine sample. Eight phthalate metabolites were measured in urine by using high-performance liquid chromatography and tandem mass spectrometry; data were corrected for urine dilution by adjusting for specific gravity. The neutral single-cell microgel electrophoresis assay (comet assay) was used to measure DNA integrity in sperm. **In conclusion, this study represents the first human data to demonstrate that urinary MEP, at environmental levels, is associated with increased DNA damage in sperm.**

- [Duty SM](#), [Singh NP](#), [Silva MJ](#), [Barr DB](#), [Brock JW](#), [Ryan L](#), [Herrick RF](#), [Christiani DC](#), [Hauser R](#). Environ Health Perspect. 2003 Jul;111(9):1164-9.

Phthalate exposure and pulmonary function.

For a change from the 25th to the 75th percentile in MBP level among men, FEV1 decreased 112 mL (SE = 51, $p = 0.03$). Monoethyl phthalate (MEP) was associated with lower FVC and FEV1 values in men. Monoethylhexyl phthalate (MEHP), the metabolite of the plasticizer commonly used in medical tubing, was not adversely associated with any of the pulmonary function parameters evaluated. **Our results suggest that MBP and MEP, but not MEHP, may influence pulmonary function among adult males.**

- [Hoppin JA](#), [Ulmer R](#), [London SJ](#).
- Environ Health Perspect. 2004 Apr;112(5):571-4.

Phthalates: Personal Care Products

Consumer Update — FDA admits inability to ensure the safety of personal care products

- "The [Food, Drug and Cosmetic Act] contains no provision that requires demonstration to FDA of the safety of ingredients of cosmetic products... prior to marketing the product." — FDA response to EWG petition, September 29 2005
- *Eighty-nine (89) percent of the 10,500 ingredients FDA has determined are used in personal care products have not been evaluated for safety by the CIR, the FDA, or any other publicly accountable institution.*
- www.ewg.org

Why This Matters — Cosmetics and Your Health

Why personal care products? At first blush it may seem that mascara and shaving cream have little relevance to the broader world of environmental health. Think again. In August 2005, when scientists published a study finding a relationship between plasticizers called phthalates and **feminization of U.S. male babies**, they named fragrance as a possible culprit. When estrogenic industrial chemicals called parabens were found in human **breast tumor tissue** earlier this year, researchers questioned if deodorant was the source. And when studies show, again and again, that **hormone systems in wildlife** are thrown in disarray by common water pollutants, once again the list of culprits include personal care products, rinsing down drains and into rivers.

Personal care product use predicts urinary concentrations of some phthalate monoesters

Abstract: **Phthalates are multifunctional chemicals used in a variety of applications, including personal care products.** A nurse-administered questionnaire was used to determine use of personal care products, including cologne, aftershave, lotions, hair products, and deodorants.

Men who used cologne or aftershave within 48 hr before urine collection had higher median levels of monoethyl phthalate (MEP) (265 and 266 ng/mL, respectively) than those who did not use cologne or aftershave (108 and 133 ng/mL, respectively). For each additional type of product used, MEP increased 33% (95% confidence interval, 14-53%).

[Duty SM](#), [Ackerman RM](#), [Calafat AM](#), [Hauser R](#)

- Source: ENVIRONMENTAL HEALTH PERSPECTIVES 113 (11): 1530-1535 NOV 2005

Phthalates and human health

Abstract: The diesters of 1,2-benzenedicarboxylic acid (phthalic acid), commonly known as **phthalates**,...are primarily used as plasticizers in the manufacture of flexible vinyl which, in turn, is used in consumer products, flooring and wall coverings, food contact applications, and medical devices.(1-3) **Manufacturers use low molecular weight phthalates (for example, diethyl phthalate [DEP] and dibutyl phthalate [DBP]) in personal-care products (for example, perfumes, lotions, cosmetics), as solvents and plasticizers for cellulose acetate, and in making lacquers, varnishes, and coatings, including those used to provide timed releases in some pharmaceuticals.(3-5)**

- [Hauser R, Calafat AM](#)
- Source: OCCUPATIONAL AND ENVIRONMENTAL MEDICINE 62 (11): doi:10.1136/oem.2004.017590 NOV 2005

Are our products harming our health? To learn about the safety of ingredients in personal care products, the Environmental Working Group compiled an electronic database of ingredient labels for 14,100 name-brand products and cross-linked it with 37 toxicity or regulatory databases. Here's what we found:

- More than one-third of all personal care products contains at least one ingredient linked to **cancer**.
- 57 percent of all products contain "**penetration enhancer**" chemicals that can drive other ingredients faster and deeper into the skin to the blood vessels below.
- 79 percent of all products contain ingredients that may contain harmful **impurities** like known human carcinogens, according to FDA or industry reviews. Impurities are legal and unrestricted for the personal care product industry.

Top 20 Brands of Concern

Skin Deep's safety assessment ratings provide a measure of potential health concerns linked to ingredients used in popular health and beauty brands. The brands listed below contain ingredients with the average highest levels of concern according to our rating system, from among the 121 brands with at least 25 products in Skin Deep's database.

1. **Dark & Lovely**, L'Oréal
2. **Chanel**, Chanel
3. **Clarins**, Clarins Paris
4. **Lierac**, ALES Group USA
5. **Banana Boat**, Playtex Products
6. **Te Tao**, Kuan Ltd.
7. **Ultima II**, Revlon
8. **Estée Lauder**, Estée Lauder
9. **Back to Basics**, Graham Webb International
10. **Revlon**, Revlon

○ www.ewg.org

Top 20 Brands of Concern

11. **Fresh**, Fresh
12. **Sally Hansen**, Del Laboratories, Inc.
13. **Murad**, Murad
14. **B. Kamins**, Kamins Dermatologics
15. **Clairol**, Procter & Gamble
16. **Elizabeth Arden**, Elizabeth Arden, Inc.
17. **Gillette**, Procter & Gamble
18. **Freeman**, pH Beauty Labs
19. **Color Me Beautiful**, Color Me Beautiful
20. **CARGO**, Cargo Cosmetics Corp.

1. Dark & Lovely, L'Oréal

Score: 4.6 Concern: higher

Rank: 965 of 1006 (1=lowest concern)

Dark & Lovely makes these product types: Hair Color and Bleaching, Conditioner, Relaxer, Styling Gel/Lotion, Shampoo

Quick Facts

- 28 products ([browse](#))
- 0 unique ingredients
- 96 ingredients raise [health concerns](#)
- 32 [violations, restrictions, and warnings](#)
- 1 proprietary ingredients - identity unknown

Industry panel assessments

- 112 ingredients have been assessed by the cosmetics industry
- -112 ingredients have **not** been assessed by the cosmetics industry
- 13 ingredients not assessed by industry have been assessed by FDA 1 of the unassessed ingredients is innocuous (e.g. table salt)

Other ingredient hazards

- 189 ingredients have [data gaps and not assessed](#)
- 8 ingredients have [occupational hazards](#)
- 20 ingredients have [other relevant risk considerations](#)

2. BRAND REPORT: Chanel owned by Chanel

Chanel makes these product types: Facial Cleanser, Facial Moisturizer/Treatment, Anti-aging, Perfume, Around-eye Cream, Eye Makeup Remover, Body Wash/Cleanser, Acne Treatment, Lip Balm/Treatment, Exfoliant/Scrub, Moisturizer

Score: 4.4 Concern: higher Rank: 950 of 1006
(1=lowest concern)

- **Quick Facts**
- **26 products (browse)**
- **0 unique ingredients**
- **73 ingredients raise health concerns**
- **25 violations, restrictions, and warnings**
- **2 proprietary ingredients - identity unknown**

2. BRAND REPORT: Chanel

Endocrine disruptor

- 7 ingredients considered potential endocrine disruptor(s), raising concern for impaired fertility or development, and increased risks for certain cancers
[ISOBUTYLPARABEN](#) [11], [BUTYLPARABEN](#) [11], [SODIUM METHYLPARABEN](#) [2], [METHYLPARABEN](#) [22], [ETHYLPARABEN](#) [14], [DIETHYL PHTHALATE](#) [3], [PROPYLPARABEN](#) [19]

Skin sensitizer

- 20 ingredients with potential to instigate immune system response that can include itching, burning, scaling, hives, and blistering of skin (sensitization) [POLYSORBATE-20](#) [8], [ISOBUTYLPARABEN](#) [11], [BUTYLPARABEN](#) [11], [LACTIC ACID](#) [2], [HEXYLENE GLYCOL](#) [1], [PROPYLENE GLYCOL](#) [20], [SODIUM METABISULFITE](#) [1], [SORBIC ACID](#) [3], [BENZOPHENONE-4](#) [1], [TOCOPHERYL ACETATE](#) [10], [SODIUM LACTATE](#) [5], [TRIETHANOLAMINE](#) [4], [CHLORHEXIDINE DIGLUCONATE](#) [2], [COCAMIDOPROPYL BETAINE](#) [1], [METHYLPARABEN](#) [22], [ETHYLPARABEN](#) [14], [DIETHYL PHTHALATE](#) [3], [BENZOPHENONE-5](#) [1], [PROPYLPARABEN](#) [19], [BHT](#) [5]

Immunotoxicity hazards

- 6 ingredients potentially harmful to the immune system [SODIUM METABISULFITE](#) [1], [ZINC OXIDE](#) [1], [TRIETHANOLAMINE](#) [4], [ZINC GLUCONATE](#) [2], [DIETHYL PHTHALATE](#) [3], [BHT](#) [5]

Top Ingredients of Concern

1. <u>MERCURY</u>	Unsafe for use in cosmetics according to FDA; Possible human carcinogen; Possible human reproductive or developmental toxin
2. <u>THIMEROSAL</u>	Unsafe for use in cosmetics according to FDA; Possible human carcinogen; Possible human reproductive or developmental toxin
3. <u>LEAD ACETATE</u>	Known human reproductive or developmental toxin; Prohibited for use in cosmetics in the European Union; Color not approved for use around eyes, in eye products
4. <u>FORMALDEHYDE</u>	Known human carcinogen; Not safe for use if aerosolized, in aerosolized product; Skin sensitizer
5. <u>TOLUENE</u>	Unsafe according to International Fragrance Association; Possible human reproductive or developmental toxin; May contain harmful impurities or breakdown products

Top Ingredients of Concern

6. <u>PETROLEUM DISTILLATES</u>	Prohibited for use in cosmetics in the European Union; Possible human carcinogen; May contain harmful impurities or breakdown products
7. <u>ETHYLACRYLATE</u>	Unsafe according to International Fragrance Association; Possible human carcinogen; Skin sensitizer
8. <u>COAL TAR</u>	Known human carcinogen; Prohibited for use in cosmetics in the European Union; May contain harmful impurities or breakdown products
9. <u>DIBUTYL PHTHALATE</u>	Prohibited for use in cosmetics in the European Union; Possible human reproductive or developmental toxin; Endocrine disruptor
10. <u>POTASSIUM DICHROMATE</u>	Possible human carcinogen; Possible human reproductive or developmental toxin; Skin sensitizer

INGREDIENT REPORT: DIBUTYL PHTHALATE (89 products)

As listed on the labels: DIBUTYL PHTHALATE; DIBUTYL PHTHLATE

DIBUTYL PHTHALATE is found in these product types: [Nail Polish](#), [Nail Treatment](#)

European Union - Classification & Labeling

DIBUTYL PHTHALATE; DBP

- May be toxic to the reproductive system (European Union classification)
- **May cause harm to the unborn child**
- Limited evidence of reproductive toxicity (European Union classification)
- Possible risk of impaired fertility
- Dangerous for the environment
- Very toxic to aquatic organisms

American Products (www.nottoopretty.org)

HAIRSPRAY

Contains Phthalates

Aqua Net Professional Hair Spray

Herbal Essences Non Aerosol Hairspray

Jheri Redding Finishers Flexible Hold Hairspray

Pantene Pro V Strong Hold Spray

Pantene Pro V Stronghold Healthy Hold Spray

Rave 4x Mega

Redken Cat Finishing Spritz

Salon Selectives Hold Tight Style Freeze Maximum

Hold Finishing Spray

Sebastian Collection Shaper Plus

Suave Maximum Hold Hairspray Unscented, non-

aerosol

Suave Naturals Extra Flexible Hold Non Aerosol

Hairspray Freesia

TREsemme European Freeze-Hold Hair Spray

VO5 Crystal Clear 14 Hour Hold

Vidal Sassoon Microfine Mist Hair Spray, Aerosol

American Products (www.nottoopretty.org)

HAIRSPRAY

Phthalate Free

Aussie Mega Styling Spray

Helene Curtis Finesse Touchables Silk Protein
Enriched

Helene Curtis Thermasilk Heat Activated Firm
Hairspray

Suave Naturals Aloe Vera Extra Hold Hairspray

DEODORANTS

Contains Phthalates

Arrid Extra Extra Dry Maximum Strength Solid

Arrid Extra Extra Dry Ultra Clear Ultra Clean Spray

Arrid Extra Extra Dry Ultra Clear Ultra Fresh Spray

Ban Delicate Powder Roll On

Degree Original Solid Anti-Perspirant &
Deodorant

Dove Solid Anti-Perspirant Deodorant

Secret Sheer Dry Regular

Secret: Powder Fresh Aerosol

Sure Clear Dry Anti-Perspirant & Deodorant

American Products (www.nottoopretty.org)

DEODORANTS

Phthalate Free

Certain Dri Anti-Perspirant Roll-On

Dove Powder Anti-Perspirant Deodorant

Lady Speed Stick Soft Solid Anti-Perspirant

Secret Anti-Perspirant & Deodorant Platinum

Protection Ambition Scent

Soft & Dri Anti-Perspirant Deodorant Clear

Gel

American Products (www.nottoopretty.org)

FRAGRANCES

Contains Phthalates

Calgon Hawaiian Ginger Body Mist

Calgon Turquoise Seas Body Lotion

Charlie Cologne Spray

Escape by Calvin Klein

Eternity by Calvin Klein

Fire & Ice Cologne Spray

Freedom

Jovan White Musk

Lancome Paris Tresor

Liz Claiborne Eau De Toilette Spray

Oscar

Parfums de Coeur White Tahitian Ginger Fantasy

Poison by Christian Dior

Red Door

The Healing Garden Pure Joy Body Treatment

White Diamonds Elizabeth Taylor

Wind Song Extraordinary Cologne by Prince Matchabelli

FRAGRANCES

Phthalate Free

All of the fragrances we tested contained phthalates

Dior

PURE
POISON



www.lambre.by

American Products (www.nottoopretty.org)

HAIR GEL

Contains Phthalates

Clairol Herbal Essences Natural Volume Body Boosting Gel

Dep Level 4 Shine Gel

LA Looks Styling Gel: Extra Super Hold

Suave Naturals Ocean Breeze Extra Control Spray Gel

TRESemme European Slick Melting Gel

Pantene Pro V Spray Gel Volumizing Root Lifter

HAIR GEL

Phthalate Free

Physique Extra Control Structuring Gel

HAIR MOUSSE

Contains Phthalates

Aussie Megahold Mousse

Clairol Herbal Essences Styling Mousse Maximum Hold

Helene Curtis Salon Selectives Rise Up Volumizing Mousse

Pantene Pro V Mousse Body Builder

HAIR MOUSSE

Phthalate Free

Finesse Touchables Silk Protein Enriched Mousse

Helene Curtis Thermasilk Heat Activated Mousse for Fine/Thin Hair

L'Oreal Paris Studio Line: Springing Curls Mousse

NAIL POLISH

Contains Phthalates

Avon beComing Radiant Long Last Nail Gloss

Cover Girl NailSlicks

Maybelline Express Finish Fast-Dry Nail Enamel

Maybelline Ultimate Wear Nail Enamel

Naturistics Super Shine Nail Gloss

Oil of Olay Nail Laquer

OPI Nail Laquer

Orly Salon Nails French Manicure

Orly Salon Nails Nail Color

Sally Hansen Chrome Nail Makeup

Sally Hansen Hard as Nails Nail Polish

Sally Hansen Hard as Nails With Nylon Nail Polish

Sally Hansen Teflon Tuff Nail Color

Tropez Nail Enamel

Wet N Wild Crystalic Calcium Enriched Nail Color

Wet N Wild Nail Color

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NAIL POLISH

Phthalate Free

Kiss Colors Nail Polish

L'Oreal Jet Set Nail Enamel

L'Oreal Jet-Set Quick Dry Nail Enamel

Maybelline Shades of Your Nail Color

Naturistics 90 Second Dry! Super Fast Nail Color

Revlon Nail Enamel

Revlon Super Top Speed

Urban Decay

HAND AND BODY LOTION

Contains Phthalates

Jergens Skincare Original Scent Lotion
Nivea Crème

HAND AND BODY LOTION

Phthalate Free

Curel Soothing Hands Moisturizing Hand Lotion
Eucerin Dry Skin Therapy Original Moisturizing Lotion
Lubriderm Skin Therapy Moisturizing Lotion
Neutrogena Hand Cream
Suave Naturals Sun Ripened Moisturizing Body Lotion
Vaseline Intensive Care Advanced Healing
Vaseline Intensive Care Dry Skin Lotion

Something has come between me and my Calvins



Toxic chemicals in beauty care products.

Calvin Klein's Eternity. Aqua Net Hair Spray. Salon Selectives Hair Mousse. Dove Solid Anti-Perspirant.

All these cosmetics and beauty aids have two things in common.

They're manufactured by Unilever, the Dutch-based consumer products conglomerate.

And they all contain toxic chemicals called phthalates (THA-lates).

Phthalates have been shown to damage the lung, liver and kidneys, and to harm the developing testes of male offspring.

These results come from animal tests which, according to

government scientists, are relevant to predicting health impacts in humans.

Last week, the European Union ordered a phase-out of two phthalates in cosmetic and beauty products.

Today, the U.S. Cosmetics Ingredient Review Panel will decide whether American consumers will be protected.

Safe alternatives to phthalates are already being used in many beauty products. Now is the time for the federal government—and for companies like Calvin Klein and Unilever—to act decisively.

After all, Eternity is a long time.

Learn more at www.NotTooPretty.org

**This ad sponsored by Women's Voices for the Earth,
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Women's Voices for the Earth, 114 West Pine Street, Missoula, MT 59802

Sexy for her.

For baby, it could really be poison.

Toxic chemicals linked to birth defects are being found at alarming levels in women of childbearing age.

And according to new laboratory tests (see chart at right), these same chemicals are being added to popular cosmetics and beauty aids, from Poison perfume to Arid Extra Extra Dry deodorant.

Manufacturers use these chemicals, known as phthalates (tha-lates), to add flexibility and help dissolve other ingredients. They're also used in industrial adhesives, and in medical and consumer goods made with polyvinyl chloride plastic (PVC).

But phthalates have been shown to damage the lungs, liver and kidneys, and to harm the developing testes of offspring.

These results come from animal tests which, according to government scientists, are relevant to predicting health impacts in humans.

Despite this, the Food and Drug Administration doesn't regulate phthalates in cosmetics. In most cases, phthalates aren't even listed on the label.

The FDA must act now. All cosmetics — as well as food-related and medical products containing phthalates — must be labeled. And manufacturers should publicly pledge to voluntarily remove phthalates as quickly as possible.

Phthalate-free alternatives are available in every product category. And some companies have already announced phase-out policies.

In the meantime, we believe that every consumer — indeed, anyone who cares about the health of future generations — should demand action from companies and the FDA. Learn more at www.NotTooPretty.org.

After all, Eternity is a long time.

What Are You Wearing?

Chloro-ethyl samples of hair products, body lotions, deodorants and fragrances, including those listed below, were analyzed by an independent testing lab for the presence of phthalates. Four were found: BBP, DBP, DEP and DEHP. The phthalate content of listed nail polishes comes from manufacturers' information and ingredients listings on labels.

Products listed below as "phthalate free" contained no detectable trace of the four compounds. Products listed as "contain phthalates" contained one of the four, while those noted with an asterisk contained more than one.

Total phthalate exposure comes from repeated small individual doses from cosmetics and a wide range of products containing PVC plastics, including shower curtains and window shades; some plastic food packaging; and medical devices such as IV fluid and blood bags. Other sources of phthalate exposure include paints, pesticides and paving石.

HAIR PRODUCTS

Contain Phthalates

Aqua Net Professional Hair Spray*
LA Looks Styling Gel Extra Super Hold
Suzie Naturala Ocean Breeze Extra Control Spray Gel
TRESemmé Curved
Tweeze Hold Hair Spray*
VO5 Crystal Clear 14 Hour Hold

Phthalate Free

Aussie Mega Styling Spray
Finesse Touchables Side Protein Enriched Mousse
Hilene Curts Thermaalk
Heat Activated Firm Hair Spray
L'Oréal Paris Studio Line Springing Curls Mousse
Suzie Naturala Aloe Vera Extra Hold Hairspray

DEODORANTS

Contain Phthalates

Arid Extra Extra Dry Ultra Clear Ultra Fresh Spray*
Ban Deodorant Powder Roll-On
Dyrene Original Solid
Arid-Permpiant & Deodorant
Sacral Shave Dry Regular*
Suzie Clear Dry Anti-Permpiant & Deodorant

Phthalate Free

Certain Dry Anti-Permpiant Roll-On
Dove Powder Anti-Permpiant Deodorant
Lucky Speed Stick Soft Solid Anti-Permpiant
Sacral Anti-Permpiant & Deodorant
Platinum Protection Amibion Scent Soft & Dry Anti-Permpiant Deodorant Clear Gel

BODY LOTIONS

Contain Phthalates

Jergens Silcocke Original Scent Lotion
Nivea Creme
Phthalate Free
Lubriderm Skin Therapy Moisturizing Lotion
Vaseline Intensive Care Advanced Healing

FRAGRANCES

Contain Phthalates

Calgon Hawaiian Ginger Body Mist
Charlie Cologne Spray
Elizabeth Taylor White Diamonds
Escape by Calvin Klein
Eternity by Calvin Klein
Fire & Ice*
Freedom
Lancome Paris Tressor Color*
Roses by Christian Dior*
The Healing Garden Pine Joy Body Treatment*
Wild Song Perfume by Prince Matchabelli

NAIL POLISHES

Contain Phthalates

Christian Dior Nail Enamel
Cover Girl Nail Sticks
Epona Fresh
Nails
CPI
Sally Hansen
Sally Hansen Hard as Nails
Wild n' Wild

Phthalate Free

Jel Gel
Revlon Nail Enamel
Super Top Speed
Urban Decay

*Contains multiple phthalates

Visit www.NotTooPretty.org to learn more about the dangers of phthalates, and to review the full cosmetic testing results in detail. You may also download a free copy of our new report, "Not Too Pretty: Phthalates, Beauty Products and the FDA."

Learn more at www.NotTooPretty.org

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Health Care Without Harm, 1755 S Street NW, Suite 602, Washington, DC 20009

Organizations:

- **Phthalates in building products:**
Healthy Building Network, www.healthybuilding.net
Contact: Bill Walsh, 202-232-4108, bill@healthybuilding.net
- **Phthalates in cosmetics:**
Coming Clean, www.come-clean.org
Contact: Bryony Schwan, 406-543-3747,
swan@womenandenvironment.org
- **Phthalates in medical devices:**
Health Care Without Harm, www.noharm.org
Contact: Stacy Malkan, 202-234-0091, ext. 14,
smalkan@hcwh.org
- **Phthalates in nail polish:**
Environmental Working Group, www.ewg.org
Contact: Mike Casey, 202-667-6982, mcasey@ewg.org
- **Phthalates in toys:**
Greenpeace
Contact: Lisa Finaldi, lisa.finaldi@dialb.greenpeace.org



DRUG-HERB-VITAMIN INTERACTIONS

Kim B. Khauv, DC MPH

Terminology

- **Body Chemistry** - Your body functions because millions of chemical reactions are constantly going on inside you.

- When the body is not working properly, drugs can often replace a chemical that is missing, block an unwanted reaction, or enhance the body to lose or need more of important nutrients, such as potassium, sodium, calcium, or some vitamins.

Terminology

- **Side effects** - All drugs have the potential to cause unwanted symptoms, or side effects.
- **Depletions** - Happens when a drug causes the body to lose a nutrient.
- **Interactions** - Happens when a nutrient affects the way a drug works, or when a drug affects the way a nutrient works. Interactions can be beneficial or harmful.

Legend

May be beneficial

- ☺ **Depletion or interference** - the medication may deplete or interfere with the absorption or function of the nutrient. Taking these nutrients may help replenish them.
- ☺ **Side effect reduction/prevention** - taking these supplements may help reduce the likelihood and/or severity of a potential side effect caused by the medication.
- ☺ **Supportive interaction** - taking these supplements may support or otherwise help your medication work better.


Legend

Avoid

- ⊗ **Adverse interaction** - Avoid these supplements when taking this medication because taking this medication because them together may cause undesirable or dangerous results.
- ⊗ **Reduced drug absorption/bioavailability** - Avoid these supplements when taking this medication since the supplement may decrease the absorption and/or activity of the medication in the body.

Legend

Explanation required

 **Other** - Before taking any of these supplements or eating any of these foods with your medication, read the drug article in full for details.

ACETAMINOPHEN

- Acetaminophen is used to reduce pain and fever.
- Unlike NSAIDs (nonsteroidal anti-inflammatory drugs), it lacks anti-inflammatory activity.
- Acetaminophen is available by itself or in nonprescription and prescription-only combination products used to relieve pain and the symptoms associated with colds and flu.

ACETAMINOPHEN

Common Names:





- 222 AF
- Abenol
- Boots Children's Pain Relief Syrup
- Cephanol
- Children's Feverhalt
- Infadrops
- Pain Aid Free
- Paldesic, Paradin
- Tylenol
- WestCan Extra Strength Acetaminophen

ACETAMINOPHEN







Combination Drugs:

- Alka-Seltzer Plus
- Excedrin PM
- Midrin
- Nyquil Hot Therapy Powder
- Theraflu
- Tylenol Allergy Sinus
- Tylenol Cold
- Tylenol with Codeine
- Vicodin

ACETAMINOPHEN

	May be Beneficial: Side effect reduction/prevention	Milk thistle N-acetyl cysteine
	May be Beneficial: Supportive interaction	Vitamin C
	Avoid: Reduced Drug absorption/bioavailability	Hibiscus
	Check: Other	Schisandra
	Depletion or interference	None Known
	Adverse interaction	None Known

ACETAMINOPHEN

	Milk Thistle (Silymarin)	Shown to elevate liver glutathione levels
	Vitamin C	Prolong the time acetamin stays in body
	Hibiscus	Could decrease levels of acetaminophen
	Foods: ↑ carb, ↑ Pectin	Interfere w/ acetamin absorption (broccoli, brussels sprouts, cabbage, jellies)
	Foods: Alcohol	Cause liver damage w/ ↑ acetamin
	Schisandra (Gomisin A)	Protect against liver damage but did not prevent glutathione depletion

Amoxicillin

Member of the penicillin family of antibiotics. Used to treat middle ear bacterial infections.

Amoxicillin

Common
names:

- Almodan
- Amix
- Amoxil
- Amoxycillin
- Polymox
- Trimox
- Wymox

Combination drug:

- Augmentin
(amoxicillin/clavulanate)

AMOXICILLIN

☺	May be Beneficial: Depletion or interference	Vitamin K
☺	May be Beneficial: Side effect reduction/prevention	<ul style="list-style-type: none">•Lactobacillus•Acidophilus•Probiotics•Vitamin K
☺	May be Beneficial: Supportive interaction	<ul style="list-style-type: none">•Bromelain•Saccharomyces•Boulardii
	Depletion or interference	Not Known
	Adverse interaction	None Known






AMOXICILLIN

😊	Probiotics	Decrease frequency of diarrhea
😊	Vitamin K	Excessive bleeding due to reduced Vit K activity
😊	Bromelain	Increase absorption of amoxicillin
😊	Lactobaccillus	Prevent antibiotic induced diarrhea

FLUOVOXAMINE (Prozac)

Member of the selective serotonin reuptake inhibitor (SSRI) family of drugs. Fluoxetine is used to treat depression, bulimia (binge-eating and vomiting), obsessive-compulsive disorder, and other conditions.

FLUOXETINE

	May be Beneficial: Depletion or interference	Melatonin
	May be Beneficial: Side effect reduction/prevention	•Ginkgo biloba
	May be Beneficial: Supportive interaction	•DHEA •Folic Acid
	Avoid: Adverse interaction	•5-HTP •Alcohol •L-tryptophan •St. John's wort
	Check: Other	Melatonin

FLUOXETINE

☺	Melatonin	Lowered melatonin levels
☺	Ginkgo biloba	Alleviating sexual side effects in men and women
☺	DHEA	Dehydroepiandrosterone shown to restore the response of beta-endorphin (pain/pleasure sensation)
⊘	Alcohol	Intensify dizziness and drowsiness; risk of accidental injury.

ASPIRIN

A drug that reduces swelling, pain, and fever. Have been recommended to reduce the risk of heart attacks and strokes. In the future aspirin may be recommended to reduce risk of some cancers.

Reye's syndrome, a rare but serious illness affecting children and teenagers, have been associated with aspirin use.

ASPIRIN




Common names:

- Boots back pain relief
- Aspirin
- Aspro Clear
- Nu-Seals Aspirin
- Novasen
- Caprin

Combination Drugs:

- Alka-Seltzer
- Anacin
- Soma Compound with Codeine
- Percodan
- Fiorinal

ASPIRIN

	May be Beneficial: Depletion or interference	<ul style="list-style-type: none">•Folic acid•Iron•Vit B12•Vit C•Zinc
	May be Beneficial: Supportive interaction	<ul style="list-style-type: none">• Cayene•Licorice
	Avoid: Adverse interaction	<ul style="list-style-type: none">•Coleus•Ginkgo biloba•Vit E

ASPIRIN

☺	Folic Acid	Increased loss of Folic Acid in urine, with arthritis patients
☺	Iron	GI bleeding is common side effect of Aspirin Iron-deficiency anemia
☺	Vit B12 Vit C	Lowered Vit B12 and C levels, Aspirin damages stomach, reduce absorption of B12 and C
☺	Zinc	3 grams of aspirin lowers Zinc blood level
☺	Cayenne	Cayenne contains capsaicin; stimulates nerves to protect against damage to stomach
☹	Ginkgo biloba	Leads to increased bleeding w/ aspirin
☹	Vit E	Increase bleeding gums

HEPARIN




Heparin is a natural product, available by prescription, which is used as an anticoagulant (slows the rate of blood clot formation). Heparin is used to prevent formation of blood clots (after surgery) and to help dissolve blood clots already formed (deep vein thrombosis, pulmonary embolism)

HEPARIN








Common Names:

- Calciparine
- Hepalean
- Heparin Leo
- Multiparin
- Uniparin Calcium

HEPARIN

	May be Beneficial: Depletion or interference	Vit D
	Avoid: Adverse interaction	<ul style="list-style-type: none">•Digitalis•Dong quai•Fenugreek•Ginger•Ginkgo biloba•Horse chestnut•Red clover•Reishi•Sweet Clover•Sweet woodruff
	Check: Other	Potassium

HEPARIN

	Vit D	Heparin may interfere with activation of Vit D
	Ginger	Reduce platelet stickiness in test tubes
	Ginkgo biloba	Reduce ability of platelets to stick together
	Herbs	Containing coumarin-derivatives (dong quai, fenugreek, horse chestnut, red clover, sweet clover, sweet woodruff)
	Reishi	Increase bleeding time
	Alcohol	Increase risk of serious bleeding
	Potassium	Heparin causes hyperkalemia (abnormally high potassium levels)

ATORVASTATIN

Common name: Lipitor






Is a member of the HMG-CoA reductase inhibitor family of drugs that blocks the body's production of cholesterol. It is used to lower elevated cholesterol.

Best absorbed without food in the morning.

ATORVASTATIN (Lipitor)

☺	May be Beneficial: Depletion or interference	Co Q10
⊘	Avoid: Adverse interaction	<ul style="list-style-type: none">•Grapefruit or grapefruit juice•Vit A
📖	Check: Other	<ul style="list-style-type: none">•Magnesium Hydroxide•Magnesium Oxide•Magnesium containing antacids•Niacin

ATORVASTATIN (Lipitor)

	Co Q10	Decreased CoQ10 in 14 days; 50% @ 30 days
	Magnesium containing antacid	Interfere with Lipitor absorption; take 2 hours before or after antacid
	Niacin (Vit B3)	Cause muscle disorders (myopathy) that can become serious (rhabdomyolysis).
	Vit A	Increased levels of Vit A in 2 years of treatment
	Grapefruit / juice	Contains substances that may inhibit the body's ability to break down Lipitor, increase its toxicity

ORAL CONTRACEPTIVES






Birth control pills are primarily used to prevent pregnancy and to treat menstrual irregularities and endometriosis. Available as an estrogen and progestin combination or as a progestin-only product.

ORAL CONTRACEPTIVES

Common names:

- Brevinor
- Levlen
- Necon
- Ortho Tri-Cyclen
- Ovrán
- Ovrette
- Triquilar

ORAL CONTRACEPTIVES

	May be Beneficial: Depletion or interference	<ul style="list-style-type: none">•Folic Acid•Magnesium•Vit B1, B12, B2, B3, B6•Vit C•Zinc
	May be Beneficial: Side Effect reduction/prevention	<ul style="list-style-type: none">•Folic Acid•Vit B6
	May be Beneficial: Supportive interaction	Folic Acid
	Avoid: Adverse interaction	<ul style="list-style-type: none">•St. John's wort•Tobacco
	Check: Other	<ul style="list-style-type: none">•Calcium•Copper•Iron•Manganese•Vit A

ORAL CONTRACEPTIVES

😊	Folic Acid	OC can cause folic acid depletion
😊	Magnesium	Lowered serum Magnesium levels
😊	Vit B6	Vit B6 depletion and clinical depression
😊	Others	Decrease in Vit B1, B2, B3, B12, C and Zinc
☹	St. John's Wort	Cause/changes intramenstrual bleeding
☹	Tobacco	5X greater risk of dying from a heart attack.
📖	Calcium and Copper	Increase absorption of CA and Copper
📖	Manganese	Interfere with Manganese absorption

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33000 North Highway 1

Ft Bragg CA 95437

707.972.0047

