

CALIFORNIA MEDICAL ASSOCIATION DEHP USE IN NEONATAL INTENSIVE CARE UNITS RESOLUTION

Adopted March, 12, 2001

Author: Robert M. Gould, MD, Adam C. Levine

Introduced by: Robert M. Gould, MD, Adam C. Levine

Whereas di-ethylhexyl phthalate (DEHP) is a plasticizer used in PVC medical devices such as IV bags, blood bags, and medical tubing; and Whereas numerous studies have found that DEHP leaches from PVC medical devices into blood, blood products, and medical solutions; [1,2,3,4] and

Whereas newborn babies undergoing medical treatment in Neonatal Intensive Care Units (NICUs) are exposed to levels of DEHP as high as 10 mg/kg/day through Total Parenteral Nutrition (TPN), 4 mg/kg/day through blood transfusions, and 42-140 mg/kg after 3-10 days of Extracorporeal Membrane Oxygenation (ECMO) support; [2,5,6,3] and

Whereas in-vitro, animal, and human neonate studies have shown DEHP to have an adverse effect on the tissues of the male reproductive tract, lungs, kidney, and liver when administered at levels similar to those which neonates are exposed to during medical treatment in NICUs; [7,8,9,10,12,14] and

Whereas an expert panel convened by the National Toxicology Program Center for the Evaluation of Risks to Human Reproduction expressed “serious concern for the possibility of adverse effects on the developing reproductive tract of male infants exposed to [the] very high levels of DEHP that might be associated with intensive medical procedures such as those used in critically ill infants”; [11] and

Whereas some of the documented adverse effects include histological damage to the testes, testicular and epididymal atrophy and agenesis, respiratory distress, pathological changes to lung tissue resembling hyaline membrane disease, reduction in creatinine clearance of kidney, and hepatocellular adenoma of the liver; [7,12,13,8,14,15] and

Whereas alternative, non-PVC products and PVC products that use alternative plasticizers (like citrates) are commercially available for most medical devices used in Neonatal Intensive Care Units; therefore be it

RESOLVED, That CMA strongly urges all hospitals to phase out their use of PVC products containing DEHP in Neonatal Intensive Care Units and encourages the use of commercially available alternatives; and, be it further

RESOLVED, That CMA calls upon health professionals, especially those involved in the care of critically ill infants, to encourage the institutions with which they are associated to adopt purchasing policies that will lead to the increasing use of non-DEHP medical devices in Neonatal Intensive Care Units; and, be it further

RESOLVED, That the CMA urge further study of the safety of the use of PVC products containing DEHP in neonatal intensive care units; and be it further

RESOLVED, That the CMA encourages medical device manufacturers to continue developing PVC-free and DEHP-free medical devices while phasing out production of those that contain PVC and/or DEHP due to problems associated with their disposal; and be it further

RESOLVED, that this matter be referred to the AMA for national action.

REFERENCES

[1] Huber, WW, Grasl-Kraupp, B, and Schulte-Herman, R. Hepatocarcinogenic potential of DEHP in rodents and its implications on human risk. *Critical Reviews in Toxicology*. 26: 365-481 (1996).

[2] Loff, S, et al. Polyvinylchloride Infusion Lines Expose Infants to Large Amounts of Toxic Plasticizers. *Journal of Pediatric Surgery*. 35: 1775-1781 (2000).

[3] Schneider, B, et al. Exposure to di(2-ethylhexyl) phthalate in infants receiving extracorporeal membrane oxygenation. *N. Engl. J Med*. 320(23): 1563 (1989). (letter)

[4] Kevy, S, and Jacobson, M. Hepatic effects of a phthalate ester plasticizer leached from poly(vinyl chloride) blood bags following transfusion. *Environmental Health Perspectives*. 45:57-64 (1982).

[5] Sjoberg, P, et al. Exposure of newborn infants to plasticizers: Plasma levels of di-(2-ethylhexyl) phthalate and mono-(2-ethylhexyl) phthalate during exchange transfusion. *Transfusion*. 25(5): 424-428 (1985).

[6] Lundberg, G, and Nilsson, C. Phthalic Acid Esters Used and Plastic Additives. Swedish National Chemical Inspectorate 1994, Report No 12/94.

[7] Arcadi, RA, Costa, CE, and Imperatore, C, et al. Oral toxicity of DEHP during pregnancy and suckling in the Long-Evans rat. *Food and Chemical Toxicology*. 36: 963-970 (1998).

[8] Roth, B, Herkenrath, P, Lehmann, HJ, et al. DEHP as plasticizer in PVC respiratory tubing systems: indications of hazardous effects on pulmonary function in mechanically ventilated preterm infants. *European Journal of Pediatrics*. 147: 41-46 (1988).

[9] (KemI) Swedish National Chemicals Inspectorate. Risk Assessment for bis(2-ethylhexyl) phthalate, Update to Draft Document, February 1999, EINECS-NO: 204-211-0.

[10] Schneider, B, et al. A prospective analysis of cholestasis in infants supported with extracorporeal membrane oxygenation. *Journal of Pediatric Gastroenterology*. 13: 285-89 (1991).

- [11] National Toxicology Program (NTP) Center for the Evaluation of Risks to Human Reproduction (CERHR): Phthalate Panel Evaluation, (July 2000).
- [12] Li, L, Jester, W, and Orth, J. Effects of relatively low levels of mono-(2-ethylhexyl) phthalate on cocultured sertoli cells and gonocytes from neonatal rats. *Toxicology and Applied Pharmacology*. 152: 258-65 (1998).
- [13] Gray, E, et al. Administration of potentially antiandrogenic pesticides (procymidone, linuron, iprodione, chlozolate, p,p-DDE, and ketoconazole) and toxic substances (dibutyl- and diethylhexyl phthalate, PCB 169, and ethane dimethane suphonate) during sexual differentiation produces diverse profiles of reproductive malformations in the rat. *Toxicology and Industrial Health*. 14: 94-118 (1999).
- [14] Crocker, J, Safe, S, and Acott, P. Effects of chronic phthalate exposure on the kidney. *Journal of Toxicology and Environmental Health*. 23: 433-444 (1988).
- [15] Moore, M. Oncogenicity study in mice with Di-2-Ethylhexyl Phthalate including ancillary hepatocellular proliferation and biochemical analysis. Vienna, VA: Corning Hazleton, Inc., CHV-633-134. Conducted for Eastman Chemical Co. 1996.