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IN FOCUS

Implementing the Use of Chemical-Free Products in a Perinatal Unit

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ABSTRACT

Objective: To develop a process to identify, adopt, and increase individual awareness of the use of chemical-free products in perinatal hospital units and to develop leadership skills of the fellow/mentor pair through the Sigma Theta Tau International Maternal-Child Health Nurse Leadership Academy (STTI MCHNLA).

Design: Pretest/posttest quality improvement project.

Setting: Tertiary care 80-bed perinatal unit.

Patients: Mothers and newborns on perinatal unit.

Interventions/Measurements: The chemical hazard ratings of products currently in use and new products were examined and compared. Chemical-free products were selected and introduced to the hospital system, and education programs were provided for staff and patients. We implemented leadership tools taught at the STTI MCHNLA to facilitate project success. Pre- and postproject evaluations were used to determine interest in the use of chemical-free products and satisfaction with use of the new products. Cost savings were measured.

Results: Products currently in use contained potentially harmful chemicals. New, chemical-free products were identified and adopted into practice. Participants were interested in using chemical-free products. Once new products were available, 71% of participants were positive about using them. The fellow and mentor experienced valuable leadership growth throughout the project.

Conclusions: The change to chemical-free products has positioned the organization and partner hospitals as community leaders that set a health standard to reduce environmental exposure for patients, families, and staff. The fellow and mentor learned new skills to assist in practice changes in a large organization by using the tools shared in the STTI MCHNLA.

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The public is unknowingly exposed to numerous toxins on a daily basis. The term *environmental chemical* refers to a chemical compound or chemical element present in air, water, food, soil, dust, or other environmental media (e.g., consumer products) (Centers for Disease Control and Prevention, 2009). Exposure to toxins can occur at home and in the health care environment. Nurses can help reduce that exposure for infants by providing chemical-free hygiene products for hospital care, sharing research about the negative effects that some chemicals can pose to human health, and teaching parents to read labels on personal care products even in the mother/baby units of hospitals. The purpose of this article is to describe a continuous quality improvement (CQI) project to increase awareness and use of chemical-free produces on a perinatal unit, its outcomes, and the leadership skills gained by the Sigma Theta Tau International Maternal Child Health Nurse Leadership Academy (STTI MCHNLA) mentor and fellow.

Environmental Toxins

Environmental toxins can be found in personal care products, plasticizer chemicals, herbicides/pesticides, food hormones, and house cleaning products (Engel et al., 2010; James-Todd, Stahlhut, Meeker, Powell, & Houser, 2012; Mei-Fei et al., 2014; World Health Organization [WHO], 2006). Presently more than 80,000 chemicals are circulating in the marketplace, and only 2% of them have been tested for toxicity; most chemicals used in commerce have never been evaluated, and many have only been evaluated in adults (Steingraber, 2010). Thus, one cannot assume that chemicals in personal hygiene products are safe, especially for infants and children.

More research is currently being conducted regarding environmental toxins and the health risks they pose to humans. A growing body of research documents harm to children's health from a variety of chemical substances (Paulson, 2011; Pen-Hua, Po-Chin, Ching-Yi, Tsung-Ho, & Jia-Yuh, 2012; Rossi, 2002). The WHO (2006) stated that environmental hazards are responsible for approximately one fourth of the total burden of disease worldwide and estimated that as many as 13 million deaths could be prevented every year by creating a healthier environment. The WHO (2006) also estimated that more than 33% of disease in children younger than age 5 years is caused by environmental exposure.

Infants and children are particularly susceptible to chemical exposure (Paulson, 2011). The fetus is vastly more sensitive to chemical exposure than adults because of low levels of some chemical-binding proteins in the blood that allow more chemicals to reach target organs, immature excretion pathways, and an immature blood–brain barrier (Houlihan, Kropp, Wiles, Gray, & Campbell, 2005). These factors combine to increase the transfer of chemicals from the blood to organs that may ultimately be negatively affected. Fetal exposure can have lifelong consequences on reproductive health as well as growth and development. Houlihan et al. (2005) found as many as 200 chemicals in cord blood at birth.

Infants and children are at greater risk for accumulation of environmental toxins due to a greater body surface area to body mass ratio. They are also more vulnerable to chemicals during critical windows of development, especially in the neurologic and endocrine systems (Browne, 2008). Infants and children eat and drink more per body weight than adults, which makes them more susceptible to chemical exposure from the foods they consume. The respirations of infants and children are more rapid, which increases their exposure to air toxins. Due to their size, more of their time is spent close to soils that may be contaminated (Paulson, 2011). Exposure can be acute or cumulative over a long period of time (Engel et al., 2010), thus small exposures can be significant if repeated.

Researchers found that common chemicals used in personal care products such as parabens, phthalates (e.g., di(2-ethylhexyl) phthalate [DEHP]), polyethylene glycol (PEG), some fragrances, diethanolamine (DEA), formaldehyde, quaternium-15, and sodium lauryl sulfate can cause endocrine disruption, reproductive disorders, carcinogenic effects, asthma, skin irritation, and allergies (Guo & Kannan, 2013, Malkan, 2011; Mei-Fei et al., 2014; Pen-Hua et al., 2012). For example, phthalate exposure has been related to development of diabetes among women (James-Todd, Stahlhut, Meeker, Powell, & Houser, 2004). The Environmental Working Group is a nonprofit research organization that provides research and education about a wide range of environmental issues that potentially affect public health. They have created a scale to rate the potential risks to humans from ingredients used in common personal care products (Environmental Working Group, 2014). Table 1 includes some chemicals used in personal care products and their hazard ratings. The work of the Environmental Working Group is valuable because the public generally believes that popular products are safe to use due to their availability in the market place and assumes that all ingredients in these products have been tested for safety (Steingraber, 2010).

Nurses can reduce infant exposure to toxins by providing chemical-free hygiene products, sharing research about negative chemical effects, and teaching parents to read labels.

The Precautionary Principle, "when an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically" (Raffensperger, Tickner, & Jackson, 1999, p. 353), is followed in European countries more than in the United States. The United States generally follows a policy that allows products to be used until they are proven unsafe. For example, it took years before restrictions were placed on tobacco products because tobacco company representatives argued that no proof was available to link tobacco use to risks to human health. Reducing exposure to untested chemicals is consistent with the Precautionary Principle. Four key components of the principle include (a) preventive action should be taken when safety is not assured, (b) the burden of proof of safety lies with the proponents of the activity (or product), (c) alternatives to the activity should be considered, and (d) public participation in decision making should be increased (Raffensperger et al., 1999).

Toxic exposure can sometimes occur in the hospital. For example, Rossi (2002) examined the exposure of neonates to DEHP in the

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