

***TPN Induced Liver Injury: Prevention and Treatment***

Arslanoglu S, Moro GE, Tauschel HD, Boehm G. Ursodeoxycholic acid treatment in preterm infants: a pilot study for the prevention of cholestasis associated with total parenteral nutrition. *J Pediatr Gastroenterol Nutr.* 2008 Feb;46(2):228-31. doi: 10.1097/MPG.0b013e3181560524. PubMed PMID: 18223390.

Chappell LC, Chambers J, Thornton JG, Williamson C. Does ursodeoxycholic acid improve perinatal outcomes in women with intrahepatic cholestasis of pregnancy? *BMJ.* 2018 Feb 1;360:k104. doi: 10.1136/bmj.k104. PubMed PMID: 29419378.

Chen CY, Chen HL. The risk factors of parenteral nutrition-associated cholestasis in preterm infants. *Pediatr Neonatol.* 2009 Oct;50(5):181-3. doi: 10.1016/S1875-9572(09)60060-7. PubMed PMID: 19856859.

Christensen RD, Henry E, Wiedmeier SE, Burnett J, Lambert DK. Identifying patients, on the first day of life, at high-risk of developing parenteral nutrition-associated liver disease. *J Perinatol.* 2007 May;27(5):284-90. Epub 2007 Mar 8. PubMed PMID: 17344923.

Clayton PT, Whitfield P, Iyer K. The role of phytosterols in the pathogenesis of liver complications of pediatric parenteral nutrition. *Nutrition.* 1998 Jan;14(1):158-64. Review. PubMed PMID: 9437703.

Collins CT, Makrides M, McPhee AJ, Sullivan TR, Davis PG, et al. Docosahexaenoic Acid and Bronchopulmonary Dysplasia in Preterm Infants. *N Engl J Med.* 2017 Mar 30;376(13):1245-1255. doi: 10.1056/NEJMoa1611942. PubMed PMID: 28355511.

D'Ascenzo R, D'Egidio S, Angelini L, Bellagamba MP, Manna M, et al. Parenteral nutrition of preterm infants with a lipid emulsion containing 10% fish oil: effect on plasma lipids and long-chain polyunsaturated fatty acids. *J Pediatr.* 2011 Jul;159(1):33-38.e1. doi:10.1016/j.jpeds.2010.12.052. Epub 2011 Mar 1. Erratum in: *J Pediatr.* 2013 Apr;162(4):883. Cogo, Paola Elena [corrected to Cogo, Paola Elisa]. PubMed PMID: 21362575.

Gura KM, Duggan CP, Collier SB, Jennings RW, Folkman J, Bistrian BR, Puder M. Reversal of parenteral nutrition-associated liver disease in two infants with short bowel syndrome using parenteral fish oil: implications for future management. *Pediatrics.* 2006 Jul;118(1):e197-201. PubMed PMID: 16818533.

Jolin-Dahel K, Ferretti E, Montiveros C, Grenon R, Barrowman N, Jimenez-Rivera C. Parenteral nutrition-induced cholestasis in neonates: where does the problem lie? *Gastroenterol Res Pract.* 2013;2013:163632. doi: 10.1155/2013/163632. Epub 2013 Nov 14. PubMed PMID: 24348529; PubMed Central PMCID: PMC3847965.

Hojasak I, Colomb V, Braegger C, Bronsky J, Campoy C, et al; ESPGHAN Committee on Nutrition. ESPGHAN Committee on Nutrition Position Paper. Intravenous Lipid Emulsions and Risk of Hepatotoxicity in Infants and Children: a Systematic Review and Meta-analysis. *J Pediatr Gastroenterol Nutr.* 2016 May;62(5):776-92. doi: 10.1097/MPG.0000000000001121. Review. PubMed PMID: 26825766.

Kasirer Y, Bin-Nun A, Raveh A, Schorrs I, Mimouni FB, Hammerman C. SMOFlipid Protects Preterm Neonates against Perinatal Nutrition-Associated Cholestasis. *Am J Perinatol.* 2019 Nov;36(13):1382-1386. doi: 10.1055/s-0038-1676977. Epub 2019 Jan 8. PubMed PMID: 30620942.



Center for  
Research, Education, Quality & Safety

Klein CJ, Revenis M, Kusenda C, Scavo L. Parenteral nutrition-associated conjugated hyperbilirubinemia in hospitalized infants. *J Am Diet Assoc.* 2010 Nov;110(11):1684-95. doi: 10.1016/j.jada.2010.08.012. Review. Erratum in: *J Am Diet Assoc.* 2011 Mar;111(3):463. Ravenis, Mary [corrected to Revenis, Mary]. PubMed PMID: 21034882.

Konnikova Y, Zaman MM, Makda M, D'Onofrio D, Freedman SD, Martin CR. Late Enteral Feedings Are Associated with Intestinal Inflammation and Adverse Neonatal Outcomes. *PLoS One.* 2015 Jul 14;10(7):e0132924. doi: 10.1371/journal.pone.0132924. eCollection 2015. PubMed PMID: 26172126; PubMed Central PMCID: PMC4501691.

Nehra D, Fallon EM, Potemkin AK, Voss SD, Mitchell PD, et al. A comparison of 2 intravenous lipid emulsions: interim analysis of a randomized controlled trial. *JPEN J Parenter Enteral Nutr.* 2014 Aug;38(6):693-701. doi: 10.1177/0148607113492549. Epub 2013 Jun 14. PubMed PMID: 23770843; PubMed Central PMCID: PMC4635445.

Postuma R, Trevenen CL. Liver disease in infants receiving total parenteral nutrition. *Pediatrics.* 1979 Jan;63(1):110-5. PubMed PMID: 108658.

Rintala RJ, Lindahl H, Pohjavuori M. Total parenteral nutrition-associated cholestasis in surgical neonates may be reversed by intravenous cholecystokinin: a preliminary report. *J Pediatr Surg.* 1995 Jun;30(6):827-30. PubMed PMID:7666317.

Salvador A, Janeczko M, Porat R, Sekhon R, Moewes A, Schutzman D. Randomized controlled trial of early parenteral nutrition cycling to prevent cholestasis in very low birth weight infants. *J Pediatr.* 2012 Aug;161(2):229-33.e1. doi:10.1016/j.jpeds.2012.02.003. Epub 2012 Mar 14. PubMed PMID: 22424948.

Shin JI, Namgung R, Park MS, Lee C. Could lipid infusion be a risk for parenteral nutrition-associated cholestasis in low birth weight neonates? *Eur J Pediatr.* 2008 Feb;167(2):197-202. Epub 2007 Apr 14. PubMed PMID: 17436017.

Steinbach M, Clark RH, Kelleher AS, Flores C, White R, Chace DH, Spitzer AR; Pediatrix Amino-Acid Study Group. Demographic and nutritional factors associated with prolonged cholestatic jaundice in the premature infant. *J Perinatol.* 2008 Feb;28(2):129-35. Epub 2007 Dec 6. PubMed PMID: 18059467.