

# Kidney Disease – How to Protect Your Kidneys As You Age and a Call for Functional Renal Medicine

By Devaki Lindsey Berkson, DC

## Complete References

1. Medscape Education April 25 2020. Clinical Consult: Hyperkalemia in Patients With T2D and CKD CME / ABIM MOC
2. Markers of Glomerular and Tubular Damage in the Early Stage of Kidney Disease in Type 2 Diabetic Patients. *Mediators Inflamm.* 2018;2018:7659243. Published 2018 Aug 9. doi:10.1155/2018/7659243
3. Potassium homeostasis in health and disease: A scientific workshop cosponsored by the National Kidney Foundation and the American Society of Hypertension. *J Am Soc Hypertens.* 2017;11(12):783–800. doi:10.1016/j.jash.2017.09.011
4. Potassium: friend or foe?. *Pediatr Nephrol.* 2017;32(7):1109–1121. doi:10.1007/s00467-016-3411-8
5. Medscape Education April 25 2020 Clinical Consult: Hyperkalemia in Patients With T2D and CKD CME / ABIM MOC
6. Menopause and Chronic Kidney Disease. *Semin Nephrol.* 2017;37(4):404–411. doi:10.1016/j.semnephrol.2017.05.013
7. Estrogen receptor agonists alleviate cardiac and renal oxidative injury in rats with renovascular hypertension. *Clin Exp Hypertens.* 2016;38(6):500–509. doi:10.3109/10641963.2015.1116550
8. Estrogen attenuates renal IRI through PPAR- $\gamma$  agonism in rats. *J Surg Res.* 2016;203(2):324–330. doi:10.1016/j.jss.2016.02.038
9. Sex hormones and their influence on chronic kidney disease. *Curr Opin Nephrol Hypertens.* 2019;28(1):1–9. doi:10.1097/MNH.0000000000000463



# ***Kidney Disease – References***

10. Protective effect of 17 $\beta$ -estradiol on ischemic acute kidney injury through the renal sympathetic nervous system. *Eur J Pharmacol.* 2012;683(1-3):270–275. doi:10.1016/j.ejphar.2012.02.044
11. Estradiol is nephroprotective in the rat remnant kidney. *Nephrol Dial Transplant.* 2003;18(1):54–61. doi:10.1093/ndt/18.1.54
12. Potential role of estradiol in ovariectomy-induced derangement of renal endocrine functions. *Ren Fail.* 2019;41(1):507–520. doi:10.1080/0886022X.2019.162578
13. Cardiovascular pharmacology of estradiol metabolites. *J Pharmacol Exp Ther.* 2004;308(2):403–409. doi:10.1124/jpet.103.058057
14. Estrogens and the kidney. *Kidney Int.* 1974;6(5):366–376. doi:10.1038/ki.1974.120
15. Ameliorative Effects of Testosterone Administration on Renal Redox Homeostasis in Naturally Aged Rats. *Rejuvenation Res.* 2015;18(4):299–312. doi:10.1089/rej.2014.1640
16. Testosterone increases renal anti-aging klotho gene expression via the androgen receptor-mediated pathway. *Biochem J.* 2014;464(2):221–229. doi:10.1042/BJ20140739
17. Sex hormones and their influence on chronic kidney disease. *Curr Opin Nephrol Hypertens.* 2019;28(1):1–9. doi:10.1097/MNH.0000000000000463
18. Evaluation of anabolic steroid induced renal damage with sonography in bodybuilders. *J Sports Med Phys Fitness.* 2018;58(11):1681–1687. doi:10.23736/S0022-4707.17.06763-9
19. <https://drlindseyberksonco749fc.zapwp.com/q:intelligent/retina:false/webp:false/w:1200/url:https://drlindseyberkson.com/wp-content/uploads/2018/11/116-finished-1.png>
20. Chronic renal disease is not chronic kidney disease: implications for use of the QRISK and Joint British Societies risk scores. *Fam Pract.* 2016;33(1):57–60. doi:10.1093/fampra/cmz092
21. The Good, the Bad and the Unknown. *Toxins (Basel).* 2016;8(11):326. Published 2016 Nov 8. doi:10.3390/toxins8110326
22. TMAO: A small molecule of great expectations. *Nutrition.* 2015;31(11-12):1317–1323. doi:10.1016/j.nut.2015.05.006
23. Red meat intake in chronic kidney disease patients: Two sides of the coin. *Nutrition.* 2018;46:26–32. doi:10.1016/j.nut.2017.08.015
24. The Metabolite Trimethylamine-N-Oxide is an Emergent Biomarker of Human Health. *Curr Med Chem.* 2017;24(36):3942–3953. doi:10.2174/0929867323666160830104025
25. Contributory Role of Gut Microbiota and Their Metabolites Toward Cardiovascular Complications in Chronic Kidney Disease. *Semin Nephrol.* 2018;38(2):193–205. doi:10.1016/j.semnephrol.2018.01.008
26. Metabolic Abnormalities in Diabetes and Kidney Disease: Role of Uremic Toxins. *Curr Diab Rep.* 2018;18(10):97. Published 2018 Sep 8. doi:10.1007/s11892-018-1064-7
27. Impact of Altered Intestinal Microbiota on Chronic Kidney Disease Progression. *Toxins (Basel).* 2018;10(7):300. Published 2018 Jul 19. doi:10.3390/toxins10070300

# ***Kidney Disease – References***

28. Trimethylamine N-Oxide, the Microbiome, and Heart and Kidney Disease. *Annu Rev Nutr.* 2017;37:157–181. doi:10.1146/annurev-nutr-071816-064732
29. Advanced chronic kidney disease populations have elevated trimethylamine N-oxide levels associated with increased cardiovascular events. *Kidney Int.* 2016;89(5):1144–1152. doi:10.1016/j.kint.2016.01.014
30. Loop diuretics decrease the renal elimination rate and increase the plasma levels of trimethylamine-N-oxide. *Br J Clin Pharmacol.* 2018;84(11):2634–2644. doi:10.1111/bcp.13728
31. Relationship between serum trimethylamine N-oxide and exposure to dioxin-like pollutants. *Environ Res.* 2018;162:211–218. doi:10.1016/j.envres.2018.01.007
32. Dioxin-like pollutants increase hepatic flavin containing monooxygenase (FMO3) expression to promote synthesis of the pro-atherogenic nutrient biomarker trimethylamine N-oxide from dietary precursors. *J Nutr Biochem.*
33. Plasma levels of trimethylamine-N-oxide can be increased with 'healthy' and 'unhealthy' diets and do not correlate with the extent of atherosclerosis but with plaque instability. *Cardiovasc Res.* 2021 Jan 21;117(2):435-449. doi: 10.1093/cvr/cvaa094. PMID: 32267921.
34. Trimethylamine-N-oxide (TMAO) response to animal source foods varies among healthy young men and is influenced by their gut microbiota composition: A randomized controlled trial. *Mol Nutr Food Res.* 2017 Jan;61(1). doi: 10.1002/mnfr.201600324. Epub 2016 Aug 3. PMID: 27377678.
35. Fish Oil Is More Potent than Flaxseed Oil in Modulating Gut Microbiota and Reducing Trimethylamine-N-oxide-Exacerbated Atherogenesis. *J Agric Food Chem.* 2019 Dec 11;67(49):13635-13647. doi: 10.1021/acs.jafc.9b06753. Epub 2019 Dec 2. PMID: 31736303.
36. Galectin-3 in Renal Pathology: More Than Just an Innocent Bystander. *Am J Nephrol.* 2016;43(5):305–317. doi:10.1159/000446376
37. Plasma galectin-3 levels are associated with the risk of incident chronic kidney disease. *Kidney Int.* 2018;93(1):252–259. doi:10.1016/j.kint.2017.06.028
38. Toward functional glycomics by localization of tissue lectins: immunohistochemical galectin fingerprinting during diethylstilbestrol-induced kidney tumorigenesis in male Syrian hamsters. *Histochem Cell Biol.* 2005;123(1):29–41. doi:10.1007/s00418-004-0733-6
39. Towards functional glycomics by localization of binding sites for tissue lectins: lectin histochemical reactivity for galectins during diethylstilbestrol-induced kidney tumorigenesis in male Syrian hamster. *Histochem Cell Biol.* 2006;126(1):57–69. doi:10.1007/s00418-006-0146-9
40. Transforming Growth Factor Beta 1 Drives a Switch in Connexin Mediated Cell-to-Cell Communication in Tubular Cells of the Diabetic Kidney. *Cell Physiol Biochem.* 2018;45(6):2369–2388. doi:10.1159/000488185

# Kidney Disease – References

41. GF- $\beta$ 1/p53 signaling in renal fibrogenesis. *Cell Signal*. 2018;43:1–10. doi:10.1016/j.cellsig.2017.11.005
42. Asymmetric dimethylarginine (ADMA) as an important risk factor for the increased cardiovascular diseases and heart failure in chronic kidney disease. *Nitric Oxide*. 2018;78:113–120. doi:10.1016/j.niox.2018.06.004
43. Toxic Dimethylarginines: Asymmetric Dimethylarginine (ADMA) and Symmetric Dimethylarginine (SDMA). *Toxins (Basel)*. 2017;9(3):92. Published 2017 Mar 6. doi:10.3390/toxins9030092
44. Is cystatin C the answer to detecting progression in CKD?. *J Am Soc Nephrol*. 2011;22(1):9–11. doi:10.1681/ASN.2010111189
45. Is cystatin C the answer to detecting progression in CKD?. *J Am Soc Nephrol*. 2011;22(1):9–11. doi:10.1681/ASN.2010111189
46. Age, sex and co-exposure to N-ethyl-N-nitrosourea influence mutations in the Alu repeat sequences in diethylstilbestrol-induced kidney tumors in Syrian hamsters. *Mutagenesis*. 2004;19(1):67–73. doi:10.1093/mutage/geh003

