

# Stanford

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## Lizzy McAninch

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### CLINICAL OFFICE (PRIMARY)

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### Bio

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#### CLINICAL FOCUS

- Endocrinology
- Thyroid Diseases
- Diabetes and Metabolism

#### ACADEMIC APPOINTMENTS

- Clinical Professor, Medicine - Endocrinology, Gerontology, & Metabolism
- Member, Wu Tsai Human Performance Alliance

#### PROFESSIONAL EDUCATION

- Medical Education, University of Miami Miller School of Medicine , MD (2009)
- Residency, University of Miami/Jackson Memorial Hospital Internal Med Residency , Internal Medicine (2011)
- Fellowship, University of Miami/Jackson Memorial Hospital Endocrinology Fellowship , Endocrinology (2014)
- Board Certification: Endocrinology, Diabetes and Metabolism, American Board of Internal Medicine (2014)

#### LINKS

- PubMed: <https://www.ncbi.nlm.nih.gov/myncbi/1PMFzLI0aXbku/bibliography/public/>
- Google Scholar: <https://scholar.google.com/citations?user=W-otpKUAAAAJ&hl=en>

### Publications

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#### PUBLICATIONS

- **FVB but Not B6 Mice Carrying the Thr92Ala-Dio2 Polymorphism Have Impaired Thyroid Hormonogenesis and Goiter.** *Endocrinology*  
Batistuzzo, A., Zhang, X., Bocco, B. M., McAninch, E. A., Salas-Lucia, F., Ribeiro, M. O., Arvan, P., Bianco, A. C., Fonseca, T. L.  
2025
- **Statin Initiation and Risk of Incident Alzheimer Disease and Cognitive Decline in Genetically Susceptible Older Adults.** *Neurology*  
Rajan, K. B., McAninch, E. A., Wilson, R. S., Dhana, A., Evans-Lacko, S., Evans, D. A.  
2024; 102 (7): e209168

- **Hyperthyroidism Due to Graves Disease After Radiofrequency Ablation.** *JCEM case reports*  
McAninch, E. A., Desai, K., McCowen, K. C., Orloff, L. A.  
2023; 1 (3): luad056
- **Critical Approach to Hypothyroid Patients with Persistent Symptoms.** *The Journal of clinical endocrinology and metabolism*  
Biondi, B., Celi, F. S., McAninch, E. A.  
2023
- **Longitudinal Changes in Blood Biomarkers of Clinical Alzheimer Disease in a Biracial Population Sample.** *Neurology*  
Rajan, K., McAninch, E. A., Aggarwal, N., Barnes, L. L., Wilson, R., Weuve, J., DeCarli, C. S., Evans, D.  
2022
- **Risk of permanent hypoparathyroidism requiring calcitriol therapy in a population-based cohort of adults older than 65 undergoing total thyroidectomy for Graves' disease.** *Thyroid : official journal of the American Thyroid Association*  
Seib, C. D., Meng, T., Cisco, R. M., Lin, D. T., McAninch, E. A., Chen, J., Tamura, M. K., Trickey, A. W., Kebebew, E.  
2022
- **Examination of Neurofilament Light Chain Serum Concentrations, Physical Activity, and Cognitive Decline in Older Adults.** *JAMA network open*  
Desai, P., Dhana, K., DeCarli, C., Wilson, R. S., McAninch, E. A., Evans, D. A., Rajan, K. B.  
2022; 5 (3): e223596
- **Brain Fog in Hypothyroidism: Understanding the Patient's Perspective.** *Endocrine practice : official journal of the American College of Endocrinology and the American Association of Clinical Endocrinologists*  
Ettleson, M. D., Raine, A., Batistuzzo, A., Batista, S. P., McAninch, E., Teixeira, M. C., Jonklaas, J., Laiteerapong, N., Ribeiro, M. O., Bianco, A. C.  
2021
- **Comparative effectiveness of levothyroxine, desiccated thyroid extract, and levothyroxine+Liothyronine in hypothyroidism.** *The Journal of clinical endocrinology and metabolism*  
Shakir, M. K., Brooks, D. I., McAninch, E. A., Fonseca, T. D., Mai, V. Q., Bianco, A. C., Hoang, T. D.  
2021
- **Longitudinal Association of Total Tau Concentrations and Physical Activity With Cognitive Decline in a Population Sample.** *JAMA network open*  
Desai, P., Evans, D., Dhana, K., Aggarwal, N. T., Wilson, R. S., McAninch, E., Rajan, K. B.  
2021; 4 (8): e2120398
- **Response to Letter to the Editor from Steen Joop Bonnema: (Comparative Effectiveness of Levothyroxine, Desiccated Thyroid Extract, and Levothyroxine+Liothyronine in Hypothyroidism)\*.** *The Journal of clinical endocrinology and metabolism*  
Shakir, M. K., Brooks, D. I., McAninch, E. A., Fonseca, T. D., Mai, V. Q., Bianco, A. C., Hoang, T. D.  
2021
- **Evidence-Based Use of Levothyroxine/Liothyronine Combinations in Treating Hypothyroidism: A Consensus Document.** *Thyroid : official journal of the American Thyroid Association*  
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2021; 31 (2): 156-182
- **Evidence-Based Use of Levothyroxine/Liothyronine Combinations in Treating Hypothyroidism: A Consensus Document.** *European thyroid journal*  
Jonklaas, J., Bianco, A. C., Cappola, A. R., Celi, F. S., Fliers, E., Heuer, H., McAninch, E. A., Moeller, L. C., Nygaard, B., Sawka, A. M., Watt, T., Dayan, C. M.  
2021; 10 (1): 10-38
- **Accelerating functional gene discovery in osteoarthritis.** *Nature communications*  
Butterfield, N. C., Curry, K. F., Steinberg, J., Dewhurst, H., Komla-Ebri, D., Mannan, N. S., Adoum, A. T., Leitch, V. D., Logan, J. G., Waung, J. A., Ghirardello, E., Southam, L., Youlden, et al  
2021; 12 (1): 467
- **Population estimate of people with clinical Alzheimer's disease and mild cognitive impairment in the United States (2020-2060).** *Alzheimer's & dementia : the journal of the Alzheimer's Association*

- Rajan, K. B., Weuve, J., Barnes, L. L., McAninch, E. A., Wilson, R. S., Evans, D. A.  
2021
- **Publisher Correction: Accelerating functional gene discovery in osteoarthritis.** *Nature communications*  
Butterfield, N. C., Curry, K. F., Steinberg, J., Dewhurst, H., Komla-Ebri, D., Mannan, N. S., Adoum, A. T., Leitch, V. D., Logan, J. G., Waung, J. A., Ghirardello, E., Southam, L., Youlten, et al  
2021; 12 (1): 3302
  - **Temporal Pole Responds to Subtle Changes in Local Thyroid Hormone Signaling.** *Journal of the Endocrine Society*  
Marcelino, C. P., McAninch, E. A., Fernandes, G. W., Bocco, B. M., Ribeiro, M. O., Bianco, A. C.  
2020; 4 (11): bvaa136
  - **Temporal changes in the likelihood of dementia and MCI over 18 years in a population sample.** *Neurology*  
Rajan, K. B., Weuve, J., Wilson, R. S., Barnes, L. L., McAninch, E. A., Evans, D. A.  
2020; 94 (3): e292-e298
  - **Remote Blood Biomarkers of Longitudinal Cognitive Outcomes in a Population Study.** *Annals of neurology*  
Rajan, K. B., Aggarwal, N. T., McAninch, E. A., Weuve, J., Barnes, L. L., Wilson, R. S., DeCarli, C., Evans, D. A.  
2020; 88 (6): 1065-1076
  - **Race, APOE $\epsilon$ 4, and Long-Term Cognitive Trajectories in a Biracial Population Sample.** *Journal of Alzheimer's disease : JAD*  
Rajan, K. B., McAninch, E. A., Wilson, R. S., Weuve, J., Barnes, L. L., Evans, D. A.  
2019; 72 (1): 45-53
  - **Amiodarone and thyroid physiology, pathophysiology, diagnosis and management.** *Trends in cardiovascular medicine*  
Trohman, R. G., Sharma, P. S., McAninch, E. A., Bianco, A. C.  
2019; 29 (5): 285-295
  - **Type 2 deiodinase polymorphism causes ER stress and hypothyroidism in the brain.** *The Journal of clinical investigation*  
Jo, S., Fonseca, T. L., Bocco, B. M., Fernandes, G. W., McAninch, E. A., Bolin, A. P., Da Conceição, R. R., Werneck-de-Castro, J. P., Ignacio, D. L., Egri, P., Németh, D., Fekete, C., Bernardi, et al  
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  - **Apolipoprotein E Genotypes, Age, Race, and Cognitive Decline in a Population Sample.** *Journal of the American Geriatrics Society*  
Rajan, K. B., Barnes, L. L., Wilson, R. S., Weuve, J., McAninch, E. A., Evans, D. A.  
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  - **Disagreement Between Hospital Rating Systems: Measuring the Correlation of Multiple Benchmarks and Developing a Quality Composite Rank.** *American journal of medical quality : the official journal of the American College of Medical Quality*  
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  - **The Swinging Pendulum in Treatment for Hypothyroidism: From (and Toward?) Combination Therapy.** *Frontiers in endocrinology*  
McAninch, E. A., Bianco, A. C.  
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  - **A Common DIO2 Polymorphism and Alzheimer Disease Dementia in African and European Americans** *JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM*  
McAninch, E. A., Rajan, K. B., Evans, D. A., Jo, S., Chaker, L., Peeters, R. P., Bennett, D. A., Mash, D. C., Bianco, A. C.  
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  - **Systemic Thyroid Hormone Status During Levothyroxine Therapy In Hypothyroidism: A Systematic Review and Meta-Analysis.** *The Journal of clinical endocrinology and metabolism*  
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- **Blood pressure and risk of incident Alzheimer's disease dementia by antihypertensive medications and APOE ε4 allele.** *Annals of neurology*  
Rajan, K. B., Barnes, L. L., Wilson, R. S., Weuve, J., McAninch, E. A., Evans, D. A.  
2018; 83 (5): 935-944
- **Induction of Type 2 Iodothyronine Deiodinase After Status Epilepticus Modifies Hippocampal Gene Expression in Male Mice.** *Endocrinology*  
Nascimento, B. P., Bocco, B. M., Fernandes, G. W., Fonseca, T. L., McAninch, E. A., Cardoso, C. V., Bondan, E. F., Nassif, R. J., Cysneiros, R. M., Bianco, A. C., Ribeiro, M. O.  
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- **Does Sex Bias Play a Role for Dissatisfied Patients With Hypothyroidism?** *Journal of the Endocrine Society*  
McAninch, E. A., Glueck, J. S., Bianco, A. C.  
2018; 2 (8): 970-973
- **Racial Differences in the Association Between Apolipoprotein E Risk Alleles and Overall and Total Cardiovascular Mortality Over 18 Years.** *Journal of the American Geriatrics Society*  
Rajan, K. B., Barnes, L. L., Wilson, R. S., McAninch, E. A., Weuve, J., Sighoko, D., Evans, D. A.  
2017; 65 (11): 2425-2430
- **Bendamustine-induced nephrogenic diabetes insipidus**  
. *Clinical nephrology*  
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2017; 87 (2017) (1): 47-50
- **Cognitive decline following incident and preexisting diabetes mellitus in a population sample.** *Neurology*  
Rajan, K. B., Arvanitakis, Z., Lynch, E. B., McAninch, E. A., Wilson, R. S., Weuve, J., Barnes, L. L., Bianco, A. C., Evans, D. A.  
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- **An active life is a sweet life.** *The lancet. Diabetes & endocrinology*  
McAninch, E. A.  
2016; 4 (6): 548
- **The History and Future of Treatment of Hypothyroidism.** *Annals of internal medicine*  
McAninch, E. A., Bianco, A. C.  
2016; 164 (1): 50-6
- **Less is More: Comparing the 2015 and 2009 American Thyroid Association Guidelines for Thyroid Nodules and Cancer.** *Thyroid : official journal of the American Thyroid Association*  
Kim, B. W., Yousman, W., Wong, W. X., Cheng, C., McAninch, E. A.  
2016; 26 (6): 759-64
- **Type 2 Deiodinase Disruption in Astrocytes Results in Anxiety-Depressive-Like Behavior in Male Mice.** *Endocrinology*  
Bocco, B. M., Werneck-de-Castro, J. P., Oliveira, K. C., Fernandes, G. W., Fonseca, T. L., Nascimento, B. P., McAninch, E. A., Ricci, E., Kvárta-Papp, Z., Fekete, C., Bernardi, M. M., Gereben, B., Bianco, et al  
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- **Is a Normal TSH Synonymous With "Euthyroidism" in Levothyroxine Monotherapy?** *The Journal of clinical endocrinology and metabolism*  
Peterson, S. J., McAninch, E. A., Bianco, A. C.  
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- **Perinatal deiodinase 2 expression in hepatocytes defines epigenetic susceptibility to liver steatosis and obesity** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Fonseca, T. L., Fernandes, G. W., McAninch, E. A., Bocco, B. C., Abdalla, S. M., Ribeiro, M. O., Mohacsik, P., Fekete, C., Li, D., Xing, X., Wang, T., Gereben, B., Bianco, et al  
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- **Epicardial adipose tissue has a unique transcriptome modified in severe coronary artery disease** *OBESITY*  
McAninch, E. A., Fonseca, T. L., Poggioli, R., Panos, A. L., Salerno, T. A., Deng, Y., Li, Y., Bianco, A. C., Iacobellis, G.  
2015; 23 (6): 1267-1278
- **Prevalent Polymorphism in Thyroid Hormone-Activating Enzyme Leaves a Genetic Fingerprint That Underlies Associated Clinical Syndromes** *JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM*

- McAninch, E. A., Jo, S., Preite, N. Z., Farkas, E., Mohacsik, P., Fekete, C., Egri, P., Gereben, B., Li, Y., Deng, Y., Patti, M., Zevenbergen, C., Peeters, et al  
2015; 100 (3): 920-933
- **Differences in hypothalamic type 2 deiodinase ubiquitination explain localized sensitivity to thyroxine** *JOURNAL OF CLINICAL INVESTIGATION*  
de Castro, J., Fonseca, T. L., Ueta, C. B., McAninch, E. A., Abdalla, S., Wittmann, G., Lechan, R. M., Gereben, B., Bianco, A. C.  
2015; 125 (2): 769-781
  - **Acute-on-Chronic Kidney Injury in Thyroid Hormone Withdrawal: A Case with Possible Implications for Radioactive Iodine Planning** *CASE REPORTS IN ENDOCRINOLOGY*  
McAninch, E. A., Lagari, V. S.  
2015; 2015: 932372
  - **Thyroid Hormone at Near Physiologic Concentrations Acutely Increases Oxygen Consumption and Extracellular Acidification in LH86 Hepatoma Cells.** *Endocrinology*  
McAninch, E. A., Miller, B. T., Ueta, C. B., Jo, S., Kim, B. W.  
2015; 156 (11): 4325-35
  - **New insights into the variable effectiveness of levothyroxine monotherapy for hypothyroidism.** *The lancet. Diabetes & endocrinology*  
McAninch, E. A., Bianco, A. C.  
2015; 3 (10): 756-8
  - **Scope and limitations of iodothyronine deiodinases in hypothyroidism.** *Nature reviews. Endocrinology*  
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  - **Of rats and men: thyroid homeostasis in rodents and human beings - Authors' reply.** *The lancet. Diabetes & endocrinology*  
McAninch, E. A., Bianco, A. C.  
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Lagari, V. S., McAninch, E., Baim, S.  
2015; 127 (1): 92-98
  - **Tissue-Specific Inactivation of Type 2 Deiodinase Reveals Multilevel Control of Fatty Acid Oxidation by Thyroid Hormone in the Mouse (vol 63, pg 1594, 2014)** *DIABETES*  
Fonseca, T. L., Werneck-De-Castro, J., Castillo, M., Bocco, B. C., Fernandes, G. W., McAninch, E. A., Ignacio, D. L., Moises, C. C. S., Ferreira, A. R., Gereben, B., Bianco, A. C.  
2014; 63 (8): 2895
  - **Heterozygosis for Inactive Type-3 Deiodinase Gene in Mice Results in Delayed Puberty in Males and Precocious Puberty with Low Fertility in Females**  
Bianco, S., Martinez, D., Soares, R., Garzon, E., Lartey, L. J., Fonseca, T. L., Camargos, L. M., McAninch, E. A., Bianco, A. C.  
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  - **Coccidiomycosis Thyroiditis in an Immunocompromised Host Post-Transplant: Case Report and Literature Review** *JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM*  
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2014; 99 (5): 1537-1542
  - **Tissue-Specific Inactivation of Type 2 Deiodinase Reveals Multilevel Control of Fatty Acid Oxidation by Thyroid Hormone in the Mouse** *DIABETES*  
Fonseca, T. L., Werneck-De-Castro, J., Castillo, M., Bocco, B. C., Fernandes, G. W., McAninch, E. A., Ignacio, D. L., Moises, C. C. S., Ferreira, A., Gereben, B., Bianco, A. C.  
2014; 63 (5): 1594-1604
  - **Thyroid hormone signaling in energy homeostasis and energy metabolism** *YEAR IN DIABETES AND OBESITY*  
McAninch, E. A., Bianco, A. C., NYAS  
2014; 1311: 77-87

- **The role of thyroid hormone and brown adipose tissue in energy homeostasis** *LANCET DIABETES & ENDOCRINOLOGY*  
Bianco, A. C., McAninch, E. A.  
2013; 1 (3): 250-258
- **Efficacy of a Hospital-Based Fracture Liaison Service in the Secondary Prevention of Osteoporotic Fractures**  
McAninch, E., Lagari, V., Baim, S.  
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