



## HYPERTENSION PHARMACOGENOMICS PANEL

Disease-specific personalized medicine solutions supported by clinical evidence






Treating Hypertension with Trial-and-Error is inefficient and leads to poor outcomes. High Blood Pressure is the leading preventable cause of death in the world and 76% of patients do not have it under control. **WE CAN DO BETTER.**

## PROBLEMS WITH THE STATUS QUO:

FOR PATIENTS	FOR PROVIDERS	FOR PAYERS
<ol style="list-style-type: none"> <li>Without symptoms, there is little incentive to try multiple medications which are often layered even if ineffective.<sup>2</sup></li> <li>Each patient responds to medications differently, with only 40-50% response rate for each medication.<sup>3</sup></li> <li>Of the patients that do respond to a medication, the average response rate is 7-8mmHg over placebo for each medication.<sup>4</sup></li> <li>20% of patients show an increase in blood pressure for a given medication.<sup>5</sup></li> </ol>	<ol style="list-style-type: none"> <li>Layering of medications increases non-adherence by 70% per new medication.<sup>6</sup></li> <li>Each medication can have harmful side-effects.</li> <li>Requires multiple low-value visits that strain schedules and staff.</li> </ol>	<ol style="list-style-type: none"> <li>45% of adults in the US have hypertension.<sup>7</sup></li> <li>Adversely impacts underserved populations with less access to care.</li> <li>Leads to adverse events when unmanaged.</li> <li>Uncontrolled hypertension leads to an incremental \$131B annual cost.<sup>8</sup></li> </ol>

## INTRODUCING GENETICURE FOR HYPERTENSION

GENETICURE'S NON-INVASIVE TEST	HOW IS GENETICURE DIFFERENT?
<ul style="list-style-type: none"> <li><b>Low-cost cheek-swab test that recommends appropriate high blood pressure medications, based on each patients' genetics.</b></li> <li>Can be delivered directly to home for virtual care</li> <li>Guides clinicians to which medicine(s) are most likely to work for each patient</li> <li>Examines 17 sites in DNA that indicate which blood pressure medications best work for the patient.</li> </ul> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <p>Heart</p> <p>Genes in the heart control how hard your heart beats and heart rate</p> </div> <div style="text-align: center;">  <p>Kidneys</p> <p>Genes in the kidneys control sodium and water reabsorption in your body</p> </div> <div style="text-align: center;">  <p>Vessels</p> <p>Genes in the blood vessels control tightening (constriction)</p> </div> </div>	<p><b>More complex, disease-specific approach.</b> Other pharmacogenomics tests focus on drug metabolism, which alone is insufficient for outcomes in complex diseases like hypertension. Our patented genetic panels and clinical decision support focuses entirely on the genetics of the integrative physiology in hypertension.</p> <p><b>Evidence. First.</b> We have three clinical trials and six published peer-reviewed articles. See next page for more information.</p>

# GENETICURE IMPROVES OUTCOMES AT A LOWER COST THAN STANDARD OF CARE:

## SPEED TO CONTROL

Less time and clinical visits to titrate or switch medications



## THERAPY COMPLIANCE

Personalizing prescriptions means engaged patients seeing blood pressure results faster, with less medications. This improves treatment compliance.



## LOWER BLOOD PRESSURE LONGER

Optimal medications for each patient. Eliminating unnecessary medications with adverse responses and side effects.



## LOWER COST

Fewer doctor visits, prescriptions, strokes, heart attacks and deaths.



## THE STRONGEST CLINICAL & ECONOMIC EVIDENCE IN PHARMACOGENOMICS OF HYPERTENSION

3 Completed Trials | 684 Subjects | Five Peer-Reviewed Publications

97% OF PATIENTS UNDER CONTROL WITHIN 3 MONTHS

36% GREATER BLOOD PRESSURE REDUCTION THAN STANDARD OF CARE<sup>9</sup>

43% LESS ADVERSE EVENTS VS. STANDARD OF CARE<sup>10</sup>

47% LESS COST VS. STANDARD OF CARE

The collage features five peer-reviewed publications:

- Journal of Clinical Medicine:** "Relationship between a Weighted Multi-Gene Algorithm and Blood Pressure Control in Hypertension" by Pamela K. Phelps, Eli F. Kelley, Danielle M. Walla, Jennifer K. Ross, Jerad J. Simmons, Emma K. Bullock, Audrie Ayres, Monica K. Akre, Ryan Sprissler, and Thomas P. Olson.
- Journal of Medical Economics:** "Economic evaluation of a pharmacogenomic multi-gene panel test to optimize anti-hypertension therapy: simulation study" by Eli F. Kelley, Eric M. Snyder, Nimer S. Akhbari, Scott C. Snyder, Ryan Sprissler, Thomas P. Olson, Monica K. Akre & Ivo Abraham.
- Journal of Clinical Medicine:** "The Effect of Genetically Guided Mathematical Prediction and the Blood Pressure Response to Pharmacotherapy in Hypertension Patients" by Eli F. Kelley, Thomas P. Olson, Timothy B. Curry, Ryan Sprissler, and Eric M. Snyder.
- Association of a Multi-Gene Panel with Blood Pressure Medication Success in Patients with Hypertension: A Pilot Study** by Eric M. Snyder, Ryan Sprissler, Nimer S. Akhbari, Scott C. Snyder, Thomas P. Olson, Monica K. Akre, and Ivo Abraham.
- Journal of Medical Economics:** "The importance and challenges of developing a pharmacogenetics test for hypertension" by Eric M. Snyder, Eli F. Kelley, Ryan Sprissler, and Thomas P. Olson.

# CONCISE AND ACTIONABLE REPORTING WITH RANKED RECOMMENDATIONS AND GENOTYPE DETAILS



PROVIDES GENETIC WINDOW TO EACH UNIQUE PATIENT PHYSIOLOGY

GUIDES DOCTORS TO WHICH MEDICINE THAT IS MOST LIKELY TO WORK FOR EACH PATIENT

## HOW CAN WE HELP YOU START IMPROVING PATIENT CARE AND REDUCING COSTS?

We're extremely passionate about this technology and the difference it can make. We'd love to discuss with you how it can benefit your practice and patients.

Reach out to us and we'll gladly take time to:

- Offer complimentary tests to demonstrate the value and ease of use.
- Create a customized cost savings calculator based on your organization's population
- Walk through sample reports
- Do a deeper dive on our peer-reviewed evidence

### HEALTH ECONOMICS

- **Geneticure Test: \$249 Retail**
- 16X Return on Investments for Payers, <3 Years <sup>11</sup>
- \$1,331 Savings per Patient per Year - Direct Costs Only <sup>11</sup>
- Potential \$40B 3-Year Savings per 10 Million Patients <sup>11</sup>
- Annual Medication Costs are \$429 Greater for Patients with High vs Low Adherence but are Associated with \$3,908 Lower Annual Clinical Expenditures <sup>11</sup>

# CLINICAL REFERENCES

1. Centers for Disease Control and Prevention (CDC). *Hypertension Cascade: Hypertension Prevalence, Treatment and Control Estimates Among US Adults Aged 18 Years and Older Applying the Criteria From the American College of Cardiology and American Heart Association's 2017 Hypertension Guideline—NHANES 2013–2016*. Atlanta, GA: US Department of Health and Human Services; 2019.
2. Layering ref: James, P. A., Oparil, S., Carter, B. L., Cushman, W. C., Dennison-Himmelfarb, C., Handler, J., Lackland, D. T., LeFevre, M. L., MacKenzie, T. D., Ogedegbe, O., Smith, S. C., Svetkey, L. P., Taler, S. J., Townsend, R. R., Wright, J. T., Narva, A. S., & Ortiz, E. (2014). 2014 JNC 8. In *JAMA - Journal of the American Medical Association*. <https://doi.org/10.1001/jama.2013.284427>  
  
Adherence ref: James, P. A., Oparil, S., Carter, B. L., Cushman, W. C., Dennison-Himmelfarb, C., Handler, J., Lackland, D. T., LeFevre, M. L., MacKenzie, T. D., Ogedegbe, O., Smith, S. C., Svetkey, L. P., Taler, S. J., Townsend, R. R., Wright, J. T., Narva, A. S., & Ortiz, E. (2014). 2014 JNC 8. In *JAMA - Journal of the American Medical Association*. <https://doi.org/10.1001/jama.2013.284427>
3. Single-drug therapy for hypertension in men. A comparison of six antihypertensive agents with placebo. The Department of Veterans Affairs Cooperative Study Group on Antihypertensive Agents. Materson BJ, Reda DJ, Cushman WC, Massie BM, Freis ED, Kochar MS, Hamburger RJ, Fye C, Lakshman R, Gottdiener J. *N Engl J Med*. 1993 Apr 1; 328(13):914-21.
4. Turnbull F, Neal B, Algert C et al. Effects of different blood pressure-lowering regimens on major cardiovascular events in individuals with and without diabetes mellitus: results of prospectively designed overviews of randomized trials. *Arch. Intern. Med*. 165(12), 1410–1419 (2005).
5. Pharmacogenomic Genome-Wide Meta-Analysis of Blood Pressure Response to  $\beta$ -Blockers in Hypertensive African Americans. Gong Y, Wang Z, Beitelshes AL, McDonough CW, Langae TY, Hall K, Schmidt SO, Curry RW Jr, Gums JG, Bailey KR, Boerwinkle E, Chapman AB, Turner ST, Cooper-DeHoff RM, Johnson JA. *Hypertension*. 2016 Mar; 67(3):556-63.  
  
Predictors of antihypertensive response to a standard dose of hydrochlorothiazide for essential hypertension. Chapman AB, Schwartz GL, Boerwinkle E, Turner ST. *Kidney Int*. 2002 Mar; 61(3):1047-55.
6. Gupta, P., et al., Risk Factors for Nonadherence to Antihypertensive Treatment. *Hypertension*, 2017.69(6): p. 1113-1120
7. Centers for Disease Control and Prevention (CDC). *Hypertension Cascade: Hypertension Prevalence, Treatment and Control Estimates Among US Adults Aged 18 Years and Older Applying the Criteria From the American College of Cardiology and American Heart Association's 2017 Hypertension Guideline—NHANES 2013–2016*. Atlanta, GA: US Department of Health and Human Services; 2019.
8. Kirkland EB, Heincelman M, Bishu KG, et al. Trends in Healthcare Expenditures Among US Adults With Hypertension: National Estimates, 2003–2014. *J Am Heart Assoc*. 2018;7(11):e008731. Published 2018 May 30. doi:10.1161/JAHA.118.008731
9. Pamela K. Phelps, Eric M. Snyder, Danielle M. Walla, Jennifer K. Ross, Jerad J. Simmons, Emma K. Bullock, Audrie Ayers, Monica K. Akre, Ryan Sprissler, and Thomas P. Olson. *Journal of Clinical Medicine*. Feb 28;8(3). 2019. (PMID:30823438)
10. EF Kelley, EM Snyder, N Alkhatib, et al. Pharmacoeconomic Benefit of a Multi-Gene Panel and Blood Pressure Response to Hypertension Therapy. *J of Medical Economics*. 2018, Oct 22:1-8.
11. Kelley EF, Snyder EM, Alkhatib NS, et al. Economic evaluation of a pharmacogenomic multi-gene panel test to optimize anti-hypertension therapy: simulation study. *J Med Econ*. 2018;21(12):1246-1253. doi:10.1080/13696998.2018.1531011