Forward Looking Statements

Some of the information presented here today may contain projections or other forward-looking statements regarding future events or the future financial performance of the Company. These statements are based on management’s current expectations and the actual events or results may differ materially and adversely from these expectations. We refer you to the documents the Company files from time to time with the Securities and Exchange Commission, specifically, the Company’s annual reports on Form 10-K, its quarterly reports on Form 10-Q, and its current reports on Form 8-K. These documents identify important risk factors that could cause the actual results to differ materially from those contained in the Company’s projections or forward-looking statements.
Overview of Clinical Studies in Depression
Overview of Clinical Studies in Depression

• Studies typically use subjective patient assessment by questionnaire (HAM D-17 score) as the clinical measure of depressive symptoms

• Three different endpoints are calculated from changes in these scores: Remission, Response, and Symptom Improvement

• APA guidelines state that Remission is the only acceptable goal of treatment

• Payers assessed on Remission and Response as part of HEDIS scores

40 consecutive antidepressant studies submitted to FDA in past 20 years

• No FDA approval was based upon an active drug comparator arm and most enrolled treatment-naïve patients (not more difficult treatment-resistant patients)

• Only 13% of trials showed statistically significant improvement in remission over placebo

• Only 30% of trials showed statistically significant improvement in response over placebo

• Only 70% of trials showed statistically significant improvement in symptoms over placebo
Comparing Improvement in Remission Rates for GeneSight vs. Most Recent FDA Approved Therapeutics

<table>
<thead>
<tr>
<th>Drug</th>
<th>Placebo Comparator (%)</th>
<th>p-value</th>
<th>Active Drug Comparator (%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>vilazodone¹ Viibryd (Khan 2011)</td>
<td>-3.1%</td>
<td>0.443</td>
<td>5.2%</td>
<td>0.007</td>
</tr>
<tr>
<td>vortioxetine² Trintellix (Jain 2013)</td>
<td>6.5%</td>
<td>0.088</td>
<td>7.2%</td>
<td>0.093</td>
</tr>
<tr>
<td>vortioxetine³ Trintellix (Jacobsen 2015)</td>
<td>7.2%</td>
<td>0.093</td>
<td>7.5%</td>
<td>0.003</td>
</tr>
<tr>
<td>GeneSight Excluding Green Patients</td>
<td>7.5%</td>
<td>0.003</td>
<td>5.2%</td>
<td>0.007</td>
</tr>
</tbody>
</table>

1 – data using the HAM-D17 depression rating scale
2 – data using the Montgomery-Asberg depression rating scale
3 – data using the Montgomery-Asberg depression rating scale, 10mg dose
GeneSight Clinical Utility Studies Prior to GUIDED
Multiple Prior Studies Showing Clinical Utility of GeneSight

**La Crosse Study**  
(n=165)  
**Key Findings:**  
- 70% improvement in depressive symptoms (p<0.0001)  
- GeneSight group 2.1x more likely to respond to medication  
- Significantly higher patient satisfaction in the GeneSight arm

**Hamm Study**  
(n=44)  
**Key Findings:**  
- There was a four-fold greater improvement in symptoms at week 8 in the GeneSight guided group compared to the TAU arm

**Pine Rest Study**  
(n=49)  
**Key Findings:**  
- GeneSight guided arm had response and remission rates more than 2x TAU group  
- GeneSight predicted which patients would have poor outcomes based on gene/drug interactions
GUIDED Study
Publication Overview
Largest Double-Blind RCT of Pharmacogenomics in Mental Health

Compared ~1,200 patients with MDD who have failed one previous medication receiving GeneSight®-guided therapy to those receiving treatment-as-usual (TAU)

60 study sites including nation’s leading academic institutions

Assessed Hamilton Depression Rating Scale 17 (HAM-D17) scores from baseline to eight weeks using blinded central rater

Evaluated remission (HAM-D17 score ≤7), response (HAM-D17 reduction ≥50%), and symptom improvement (reduction in HAM-D17)
GeneSight GUIDED Study Schema

Screening, Randomization & PGx Testing

- Screening Visit (Eligibility Criteria Evaluated)
  - n = 2,004

Randomized
- Did not meet I/C criteria
  - n = 606

- n = 1,398

Treatment as Usual (TAU)

- Week 0 BASELINE
  - n = 717
  - Lost to Follow-Up
    - n = 69

- Week 4
  - n = 648
  - Lost to Follow-Up
    - n = 41

- Week 8
  - n = 607
  - Lost to Follow-Up
    - n = 48

- Week 12
  - n = 559
  - Lost to Follow-Up
    - n = 103

- Week 24
  - n = 456

Guided-Care Arm

- Week 0 BASELINE
  - n = 681
  - Lost to Follow-Up
    - n = 65

- Week 4
  - n = 616
  - Lost to Follow-Up
    - n = 56

- Week 8
  - n = 560
  - Lost to Follow-Up
    - n = 37

- Week 12
  - n = 523
  - Lost to Follow-Up
    - n = 66

- Week 24
  - n = 457

Un-Blinding

Open-Label

Study schema and participant enrollment in the peer-protocol cohort
GeneSight Test Report is Easy to Use and Understand

<table>
<thead>
<tr>
<th>ANTIDEPRESSANTS</th>
<th>USE AS DIRECTIONS</th>
<th>MODERATE GENE-DRUG INTERACTION</th>
<th>SIGNIFICANT GENE-DRUG INTERACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>sertraline (Sertraline*)</td>
<td>1</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>citalopram (Citalopram*)</td>
<td>1.6</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>paroxetine (Paxil*)</td>
<td>1.6</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>fluoxetine (Prozac*)</td>
<td>1.4</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>trazodone (Desylaine*)</td>
<td>1</td>
<td>1.2</td>
<td></td>
</tr>
</tbody>
</table>

CLINICAL CONSIDERATIONS:
1. Serum level may be too low, higher doses may be required.
2. Use of bleeding may increase risk of side effects.
3. FDAalized studies show a gene-drug interaction for these drugs.

GENE-DRUG INTERACTIONS

<table>
<thead>
<tr>
<th>ANTIDEPRESSANTS</th>
<th>CYP1A2</th>
<th>CYP2D6</th>
<th>CYP2C9</th>
<th>CYP2C19</th>
<th>CYP2C19</th>
<th>CYP2C19</th>
<th>UGT1A1</th>
<th>UGT1B18</th>
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<tbody>
<tr>
<td>sertraline (Sertraline*)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>citalopram (Citalopram*)</td>
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<tr>
<td>paroxetine (Paxil*)</td>
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</tbody>
</table>

All psychotropic medications require clinical monitoring.

CONFIDENTIAL HEALTHCARE INFORMATION

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genesight
GUIDED Results Compared to Optimized Active Drug Arm

- **Remission**
  - GeneSight Guided: 15.3%
  - TAU: 10.1%
  - p = 0.007

- **Response**
  - GeneSight Guided: 26.0%
  - TAU: 19.9%
  - p = 0.01

- **Symptom Improvement**
  - GeneSight Guided: 27.2%
  - TAU: 24.4%
  - p = 0.11

Study Arm: GeneSight Guided vs. TAU
GeneSight-Driven Outcomes are Durable and Improve over 6 Months

- Over 6 months durability
- Remission doubled during open-label period

<table>
<thead>
<tr>
<th>% of Patients</th>
<th>Remission</th>
<th>Response</th>
<th>Symptom Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 8</td>
<td>Week 24</td>
<td>Week 8</td>
<td>Week 24</td>
</tr>
<tr>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
<td>0.0%</td>
</tr>
<tr>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
<td>5.0%</td>
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<td>25.0%</td>
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<td>30.0%</td>
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<td>50.0%</td>
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</tr>
<tr>
<td>56%</td>
<td>56%</td>
<td>56%</td>
<td>56%</td>
</tr>
<tr>
<td>42.5%</td>
<td>42.5%</td>
<td>42.5%</td>
<td>42.5%</td>
</tr>
<tr>
<td>27.2%</td>
<td>27.2%</td>
<td>27.2%</td>
<td>27.2%</td>
</tr>
</tbody>
</table>

- Week 8 & Week 24

- 103% increase in remission
- 70% response improvement
- 56% decrease in HAM-D17

- Graph showing percentage of patients for remission, response, and symptom improvement at Week 8 and Week 24.
Change in “Red” Medication Use by Study Arm

- Only 57% of patients switched
- Doctors were naïve to GeneSight
- Protocol did not require switching
- Patients blinded to medication

TAU physicians did not improve ending with more patients on red medications
Outcomes for Patients Switching From “Red” Medications

- **Remission**
  - No Switch: 8.5%
  - Switch: 21.5%
  - % of Patients: 153%
  - p = 0.0067

- **Response**
  - No Switch: 16.7%
  - Switch: 28.5%
  - % of Patients: 71%
  - p = 0.0364

- **Symptom Improvement**
  - No Switch: 21.1%
  - Switch: 33.5%
  - % Decrease in HAM-D17: 59%
  - p = 0.0018
Endpoints for ITT* Population in 3 Depression Instruments

*Three Endpoints Better in All Instruments and Statistically Significant In 1+ Instruments

HAM-D17
QIDS-C16
PHQ-9

BLINDED CENTRAL RATER

<table>
<thead>
<tr>
<th>Percent of Patients</th>
<th>TAU</th>
<th>GeneSight</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>11.4</td>
<td>16.8</td>
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<tr>
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<td>19.8</td>
<td>26.1</td>
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<tr>
<td>20</td>
<td></td>
<td>26.7</td>
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<td>30</td>
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<td>23.5</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>32.9</td>
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</table>

SITE RATER

<table>
<thead>
<tr>
<th>Percent of Patients</th>
<th>TAU</th>
<th>GeneSight</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>15.6</td>
<td>20.9</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>31.4</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>32.9</td>
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<tr>
<td>30</td>
<td></td>
<td>35.1</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>29.3</td>
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</table>

PATIENT RATED

<table>
<thead>
<tr>
<th>Percent of Patients</th>
<th>TAU</th>
<th>GeneSight</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>14.8</td>
<td>18.6</td>
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<tr>
<td>10</td>
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<td>31.6</td>
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<td>20</td>
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<td>34.1</td>
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<tr>
<td>30</td>
<td></td>
<td>39.7</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>34.1</td>
</tr>
</tbody>
</table>

p < 0.01
p = 0.014
p = 0.066
p < 0.01
p = 0.285
p = 0.039

p = 0.014
p = 0.039
p = 0.069
p = 0.186
p < 0.01
p = 0.066

ITT = Intent To Treat | HAM-D17 = Hamilton Rating Scale for Depression | QIDS-C16 = Quick Inventory of Depressive Symptomology | PHQ-9 = Patient Health Questionnaire
Endpoints Highly Statistically Significant When Excluding “Green” Patients

Excludes 30% patients entering on genetically appropriate medications with no expected GeneSight benefit.

<table>
<thead>
<tr>
<th>Remission</th>
<th>Response</th>
<th>Symptom Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>p=0.003</td>
<td>p=0.008</td>
<td>p=0.029</td>
</tr>
</tbody>
</table>

- **Remission:**
  - TAU: 10.7%
  - GeneSight Guided: 18.2%

- **Response:**
  - TAU: 19.0%
  - GeneSight Guided: 27.0%

- **Symptom Improvement:**
  - % Decrease in HAM-D17:
    - TAU: 22.1%
    - GeneSight Guided: 27.1%

Study Arm: TAU | GeneSight Guided

ITT Population: GeneSight (n=357); TAU (n=429)
IMPACT Study

Publication Overview
IMPACT Study Design

• Goal was to compare outcomes of patients with major depressive disorder treated by either psychiatrists or primary care physicians using GeneSight to guide therapy selection

• Performed in cooperation with the Canadian Centre for Mental Health and Addiction (CAMH)

• Open label study

• All patients received GeneSight

• Primary endpoint was the Beck’s Depression Inventory performed at 8 weeks

• Enrolled 1,871 total patients – 810 treated by primary care providers and 1,061 treated by psychiatrists

• Patients in the primary care and psychiatrist cohorts were deemed to have no clinically meaningful differences

• Data important for Medicare to expand LCD to primary care physicians
### IMPACT Study Results

**Primary Care Physicians Had Even Better Outcomes Than Psychiatrists**

<table>
<thead>
<tr>
<th>Clinical Outcome</th>
<th>Primary Care Physicians</th>
<th>Psychiatrists</th>
<th>% Difference</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remission Rates</td>
<td>19.5%</td>
<td>12.0%</td>
<td>63%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Response Rates</td>
<td>30.1%</td>
<td>22.3%</td>
<td>35%</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Symptom Improvement</td>
<td>31.7%</td>
<td>24.9%</td>
<td>27%</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
Health Economic Data

Publication Overview
Medco Prescription Drug Study

Evaluated prescription drug claims data from 13,048 patients

Total medication costs were reduced per patient when treatment was guided by GeneSight

GeneSight-guided patients experienced significant increases in adherence and significant reductions in polypharmacy

Average Annual Medication Expenditure

- Treatment as Usual
- GeneSight

$1036 average annual savings per patient

p=0.007

12-MONTH REVIEW

Red-bin patients had

- >4-fold more disability claims (p = 0.013)
- >20 workplace absence days (p = 0.024), compared to green- (p = 0.04) or yellow-bin (p = 0.1) patients

Compared to green- or yellow-bin patients, red-bin patients had

- 67% more general medical visits* (p = 0.039)
- 69% more total healthcare visits** (p = 0.014)

Healthcare-related cost***

- Green bin $3,453 (p = 0.024)
- Yellow bin $3,426 (p = 0.027)
- **Red bin** $8,627, yielding an average annual increase in healthcare cost of **$5,188**


*General medical visits is defined as all non-psychiatric office visits.
**Total healthcare visits includes all medical visits, plus psychiatric and ER visits.
***Mean healthcare-related cost calculated during previous 12-month period.
Positive ROI with GeneSight

$1,036 + $1,556 + UP TO $775 = $3,367

Drug Spend Savings\(^1\)  +  Healthcare Savings\(^2\)  +  Productivity Savings\(^2\)  =  Potential Savings Annually

\(^1\) Winner JG, et al. Curr Med Res Opin 2015; 31(9):1633-43. (Medco) (n=2168; n=10,880 for TAU group; 5-to-1 match)
Optum Health Study Design

Patient Demographics:

- 18+ years old with psychiatric disorder (n=683, 205 with GeneSight, 478 with TAU)
- Began psychotropic medication with none taken previous 180 days
- Failed first medication and began second following GeneSight results

Utilized claims from Single Payer Database compiled by OptumInsight, Inc. comprising approximately 25 million members nationwide

Provided costs and budget impact associated with GeneSight Psychotropic testing for major commercial health plan

Defined costs as total payments made to providers for treating psychiatric disorders (depression, anxiety, bipolar disorder, panic disorder, PTSD, premenstrual dysphoric disorder, OCD, schizophrenia)

Compared members with GeneSight-guided care (CPGx cohort) to those who received treatment-as-usual (TAU cohort)

Calculated payer amounts for each cohort over 12 month episode of care
### Optum Health Study Results

#### >$6,000 in total 12-month savings for patients with MDD

<table>
<thead>
<tr>
<th></th>
<th>GeneSight</th>
<th>TAU</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Patients</td>
<td>$17,627</td>
<td>$23,132</td>
<td>$5,505 (p=0.0004)</td>
</tr>
<tr>
<td>Patients With MDD</td>
<td>$18,741</td>
<td>$24,971</td>
<td>$6,050 (p=0.009)</td>
</tr>
</tbody>
</table>

Savings do not include productivity improvements

**Pie Chart:**
- Pharmacy: 50%
- Inpatient Services: 37%
- Outpatient Services & Professional Services: 13%

---

Genesight: Optimal care delivery

25
HEDIS Scores Another Motivation For Payers With GeneSight

- Healthcare Effectiveness Data and Information Set (HEDIS) is a comprehensive set of standardized performance measures designed to provide purchasers and consumers with the information they need for reliable comparison of health plan performance.

- Behavioral health is an important component of HEDIS scores and for depression the key metrics utilized are remission and response measures.

- These metrics could be used in the future to determine Star Ratings for health insurance plans.

- Medicare Advantage plans can receive additional reimbursement if they have high Star Ratings. Plans with consistent low ratings are discontinued from Medicare Advantage.

**Depression Remission or Response for Adolescents and Adults (DRR)** - *First implemented in HEDIS 2017.*

The percentage of members 12 years of age and older with a diagnosis of depression and an elevated PHQ-9 score, who had evidence of response or remission within 4–8 months after the initial elevated PHQ-9 score.

**Denominator:** All members ≥12 years of age with a diagnosis of major depressive disorder or dysthymia who had an initial elevated PHQ-9 score of >9.

**Numerator:** A follow-up PHQ-9 score documented at 4–8 months after the initial elevated score; a PHQ-9 score <5 documented at 4–8 months following the initial elevated score (Remission); a ≥50% reduction in the PHQ-9 score documented at 4–8 months following the initial elevated score (Response).
Conclusion & Next Steps
Key Takeaways From Clinical Studies

✓ The GUIDED study is the fifth favorable clinical study and the first blinded, prospective study

✓ GeneSight led to a 50% increase in remission rates, 30% increase in response rates, and 11% improvement in symptoms with remission and response achieving statistical significance

✓ Excluding patients entering on “green medications”, GeneSight led to a 70% increase in remission, a 42% increase in response, and a 23% improvement in symptoms, all of which were statistically significant

✓ The results continued to improve over the 24 week study period with remission rates increasing to 31%, response rates increasing to 44%, and symptom improvement reaching 43%

✓ Patients switching from red medications compared to those that did not saw 153% higher remission rates, 71% higher response rates, and 59% improvement in symptoms and all were highly statistically significant

✓ The IMPACT study showed primary care physicians had results even better than psychiatrists when using GeneSight

✓ Multiple health economic studies demonstrated significant health care savings
Next Steps

- Begin the tech assessment process with major national payers and request out-of-cycle reviews where appropriate

- File formal reconsideration request with Medicare to expand LCD to primary care physicians

- Continue to publish numerous additional GUIDED studies with key opinion leaders

- Pursue professional guidelines and position papers supporting GeneSight

- Develop primary care launch plan and direct to consumer initiative to be implemented after expanded reimbursement