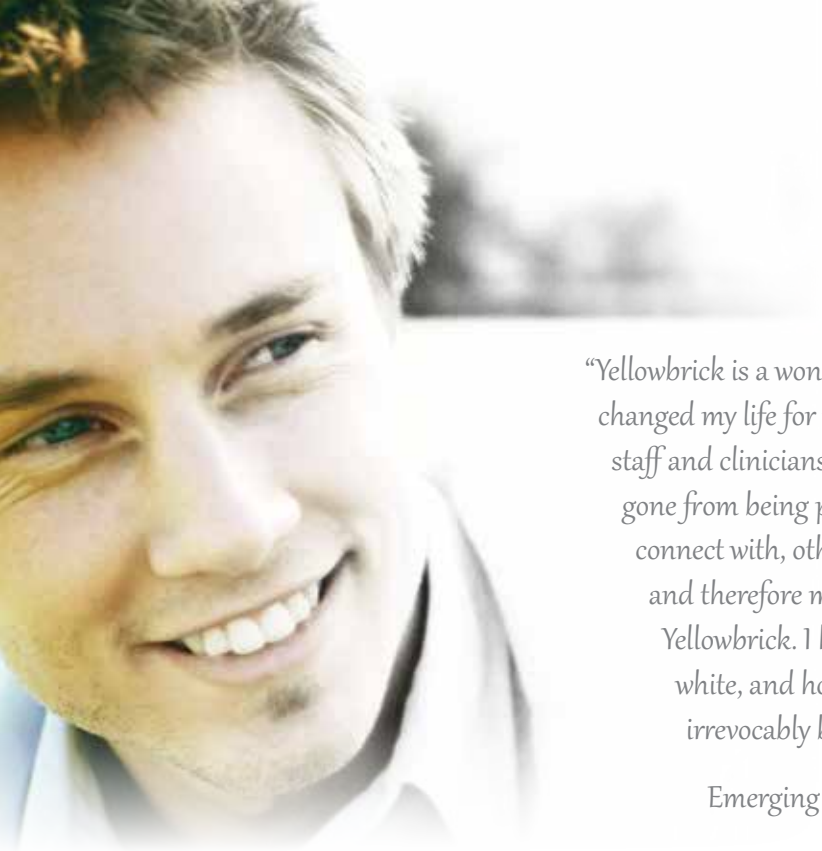
Outcome Report

Changing the brain; transforming lives

"I cannot express the depth of my gratitude. I am so excited by and proud of all the changes I have made over the past year and feel so exhilarated to live a life where I have confidence in my abilities to overcome obstacles and truly experience the joy that is in this world. I came to Yellowbrick detesting myself and now not only do I like myself overall, but I have also found many parts of myself that I love- something of which I could never conceive before my time at Yellowbrick." - Emerging Adult

YELLOWBRICK℠

FIND *YOUR* WAY HOME



"Yellowbrick is a wonderful, amazing place that has dramatically changed my life for the better. And I've personally witnessed the staff and clinicians here not only changing, but SAVING lives. I've gone from being practically unable to emotionally read, much less connect with, other people, to being a dramatically more sensitive, and therefore more connected person. I have learned to grieve at Yellowbrick. I have come to accept that the world is not black and white, and how to navigate the gray areas. I am indescribably, irrevocably better off for it."

Emerging Adult

Yellowbrick's Model

Yellowbrick's treatment model is based on recent findings from developmental neuroscience integrated with well-established, evidenced-based approaches to complex, often treatment-resistant problems. Neuroscience research indicates that deep, lasting change for emerging adults is built upon authentic competence in the world that engenders resilient self-worth, healthy ambitions, and honest, fulfilling relationships. We term this "real-time" treatment because it occurs in the moment-to-moment experiences of facing every-day challenges, such as going to class or work, managing time, balancing a budget, and in the ups and downs of relationships, while doing in-depth psychological work. That combination of real-life experience, with deep psychological work, while living within a supportive, accountable peer community, is what changes the brain and transforms lives.

Importance of Outcome Research

There are many available approaches to the treatment of complex, treatment-resistant and, often, life-threatening problems in emerging adulthood. It can be challenging and expensive to measure real improvement in such complex situations. Yet, without assessing treatment outcomes using established methods, one cannot determine the benefits of different interventions, beyond one person's subjective opinion. This is why Yellowbrick allocates time and resources to assess the objective value of our treatment interventions. As you will see in the pages ahead, outcome assessment and research is based on the same dimensions of "real-time, real-life" change that is central to the Yellowbrick model. In addition to established outcome methods, we are also developing new methods to measure changes in the brain that are believed to accompany therapeutic and life changes.

"Yellowbrick not only saved my life, but it has led me to the life I have always hoped I could live one day. . . I was one of those people who thought I could never live free of my addiction and I would never be happy. I am so grateful to say that I am now at a place in my life I never thought I'd be at. I am not only free of my addictions, but i am leading a successful and fulfilling life."

Emerging Adult

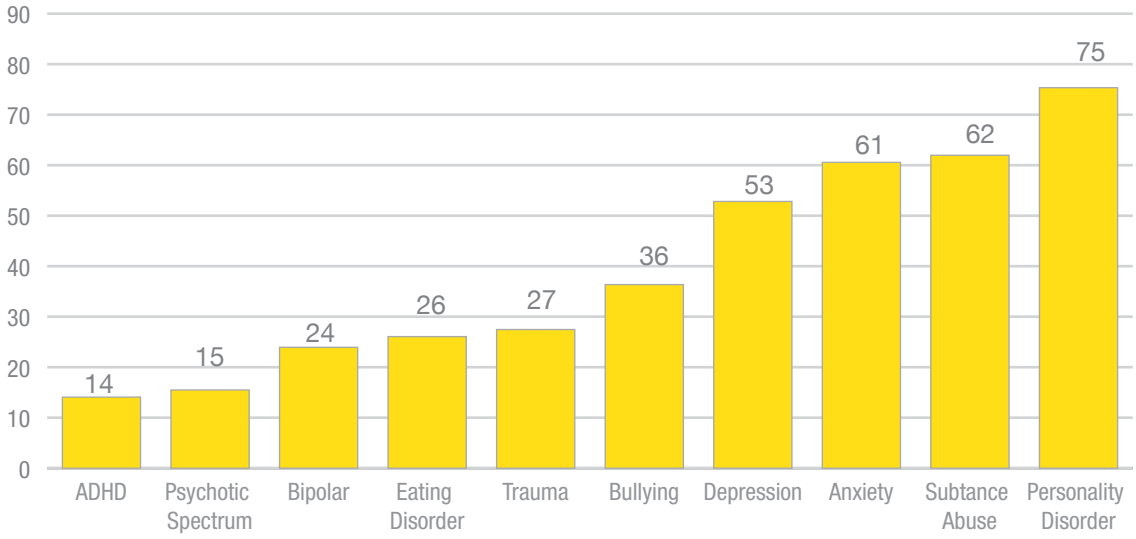
Who Comes to Yellowbrick?

Emerging Adults, age 18-30, come to Yellowbrick for intensive, multimodal treatment of the full range of neuro-psychiatric disorders. Many of the emerging adults at Yellowbrick have mood and anxiety disorders, substance abuse, eating disorders, ADHD, and personality disorders, often in combination. Almost all have been unable to function in school or work within the past six months prior to admission. Almost two-thirds, 64%, of the emerging adults have experienced trauma and/or bullying and nearly 40% have a history of attempted suicide when they come for assessment. Individuals are often referred from other treatment centers, from colleges, their families, or from their therapists and doctors at home who recognize that they need more intensive care. The graph below depicts the most common clinical features among the emerging adults at Yellowbrick, based on formal diagnostic research criteria and methods.

What is the Length of Treatment at Yellowbrick?

The typical length of stay in The Residence at Yellowbrick is 4-6 months. Emotional immersion and living through repeated but evolving cycles of core struggles together is often necessary to transform the inner world of the emerging adult. This is the roadmap toward enduring emotional and behavioral change. Following transition from The Residence, the average emerging adult continues in the Life Strategies Program IOP for an additional 3.5 months. The average total length of treatment at Yellowbrick is about 9 months.

Clinical Features of Emerging Adults at Yellowbrick



"My experience at Yellowbrick was the most helpful thing that has ever happened in my treatment life. My stay with Yellowbrick was 8 months... I went into Yellowbrick a college drop out who had no motivations. Yellowbrick helped me to apply to school, find work and extend myself. And I am happy. By the end of the day I can say I'm finally happy. That's what its all about anyways, right?"

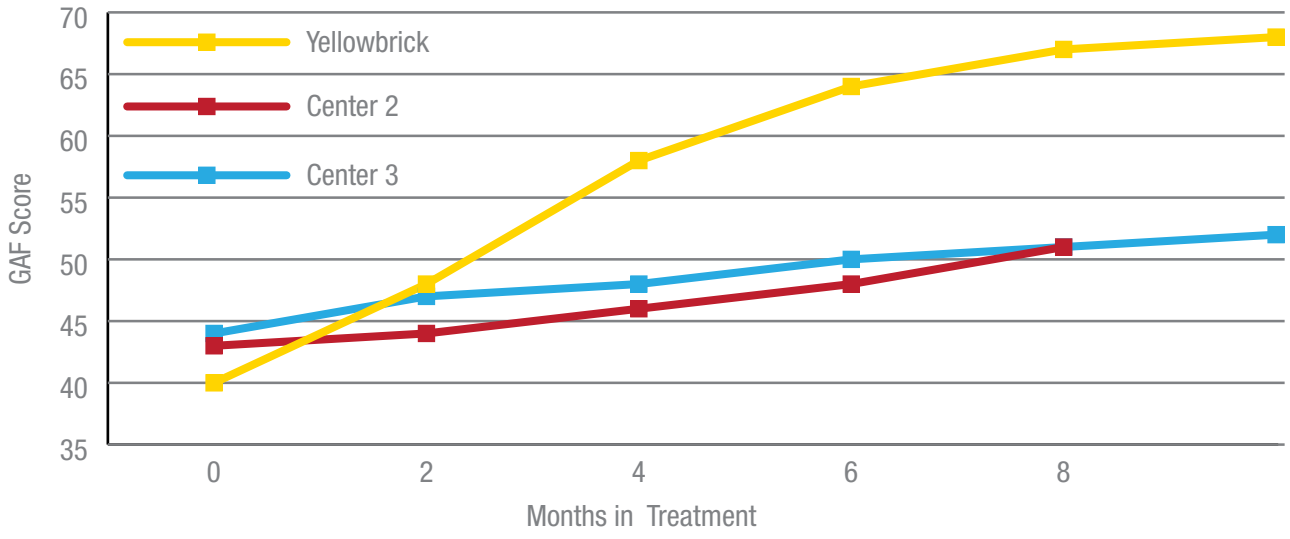
Emerging Adult

Improved Functioning

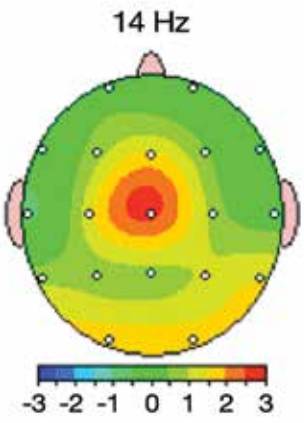
Remission of symptoms is a critical goal of treatment at Yellowbrick. Findings show that the emerging adults improve greatly across multiple symptoms over the course of their treatment. This is true of their full range of neuropsychiatric and behavioral symptoms such as depression, substance abuse and bio-behavioral dysregulation (e.g., staying up late playing video games and sleeping until the next afternoon). Findings show that Yellowbrick's emerging adults improve from seriously impaired in multiple symptom areas on admission to mildly impaired in one or a few areas at discharge. When they enter treatment, they are severely dysregulated across many domains of life functioning or need significant external regulation and support from parents and authorities in order to function effectively. By the time they leave treatment, their symptoms and behavior are substantially better self-regulated across most or all areas of life functioning.

These findings are illustrated in the figure below. Based upon the well–established Global Assessment of Functioning Scales, patients enter Yellowbrick when they are seriously impaired across a number of areas of life functioning and improve substantially in all areas of life by the time they leave The Residence. Importantly, these initial improvements maintain over the next 6-7 months of gradually less intensive treatment, more independent living, and re-building of their lives in college or a career. The improvements at Yellowbrick are illustrated in comparison to those reported by some of the premier psychiatric residential treatment centers in the country.

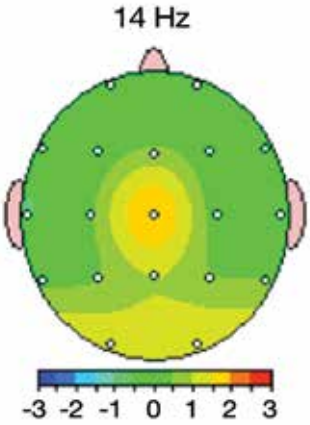
Global Assessment of Functioning (GAF)
Across Treatment Centers



Pre-treatment



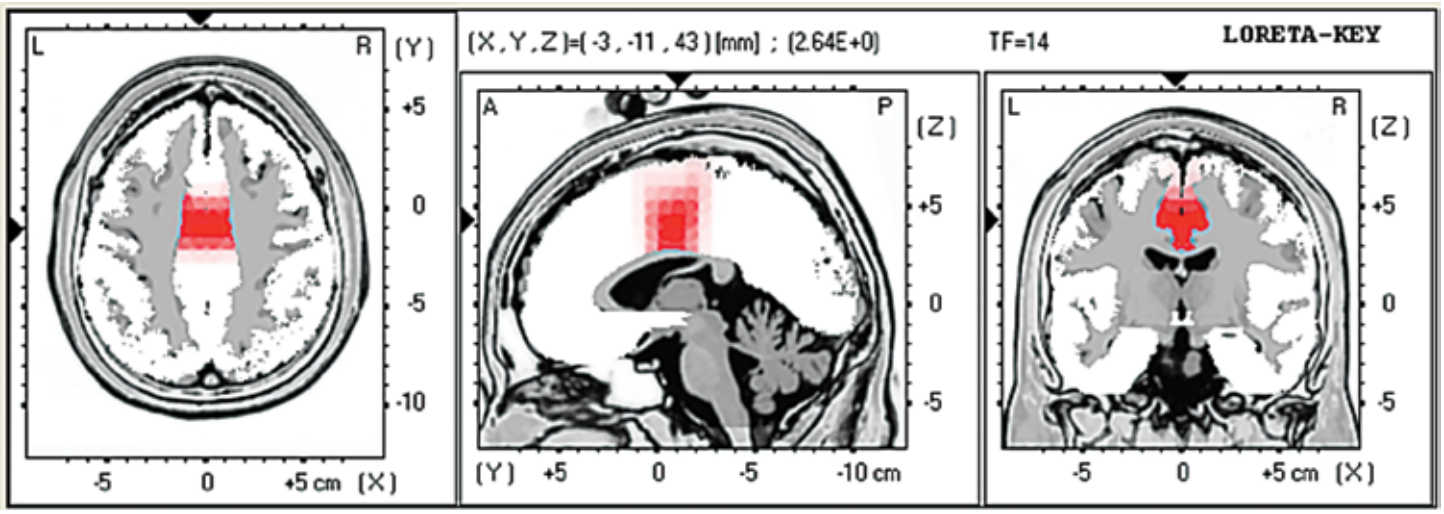
Post-treatment



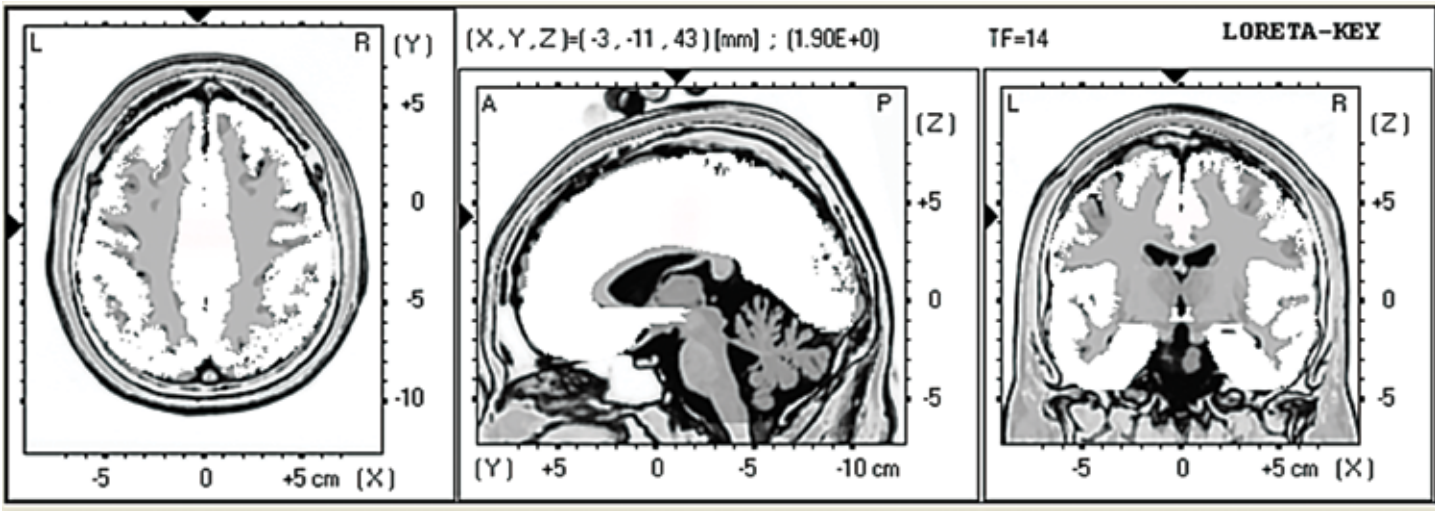
Improved Brain Function

Consistent with Yellowbrick's neurobiological model, treatment significantly improves and normalizes brain function in the emerging adults. For example, the brain changes in quantitative EEG findings illustrated here show the brain of a 24 year-old emerging adult, with history of Bipolar Disorder, Substance Abuse, Obsessive Compulsive Disorder, Personality Disorder and trauma, before and after 4 months of intensive treatment in The Residence. During the initial assessment, his brain showed significant emotional deregulation (i.e., the red areas) in the dorsal cingulate cortex, which is the area of the brain that modulates emotions and self-control. After he completed residential treatment, his emotional deregulation was eliminated and his brain function in this area was normal.

Pre-treatment Assessment



Post-treatment Assessment

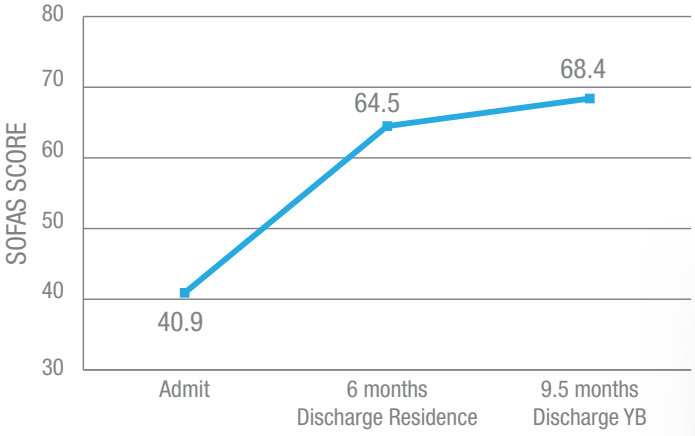


Areas of Improved Competence

Consistent with Yellowbrick's model of treatment, progress is also measured in the areas of competence necessary for effective life functioning as an emerging adult. These areas include self-care, self-regulation, self-agency and personal responsibility, and executive functioning (such as time management, planning, following through on goals, and problem solving), among others. It also includes developing the life skills required to succeed in college and a career. While in intensive psychotherapeutic treatment at Yellowbrick, 60% of the patients are also taking classes or working and an additional 24% are volunteering in the larger community. The outcome findings show that emerging adults at Yellowbrick improve substantially in all of the critical areas of life competence during the initial 6 months of treatment.

The graph below illustrates these findings for improvement in social and occupational functioning. The graph shows that, on admission, the emerging adults are seriously impaired in their social relationships and unable to work or go to college (SOFAS score on admission is 40.9). By the time they complete the intensive phase of treatment 6 months later, they are able to function effectively in both relationships and in college or a career most of the time (SOFAS score after 6 months is 64.5).

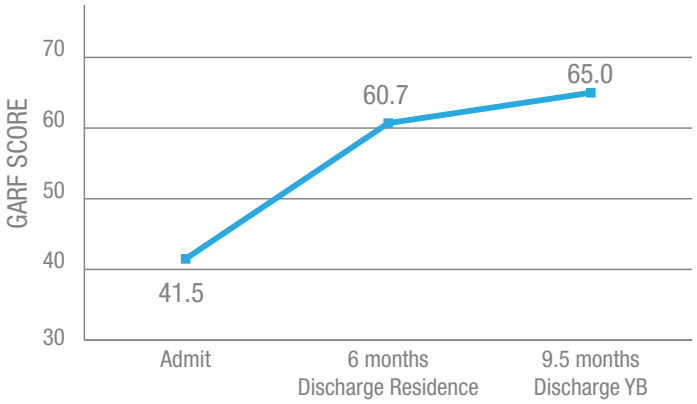
Change in Social and Occupational Functioning (SOFAS)



Improved Relationships

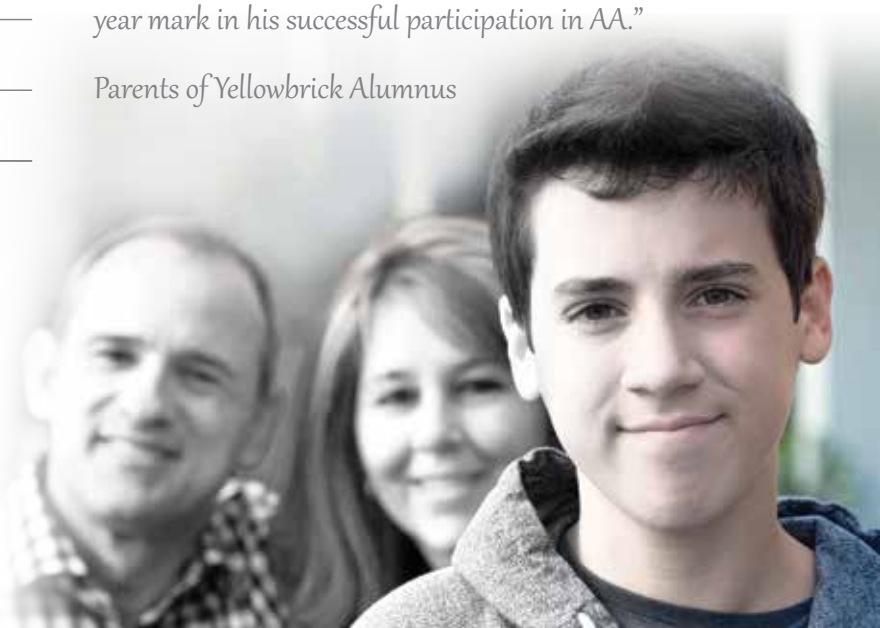
Relationships with family, peers and the broader community are essential to a meaningful and fulfilling life. Improved relationships are a major emphasis at Yellowbrick and an area in which emerging adults improve greatly. The graph below depicts improvement in the emerging adult's relationships with their families from admission (41.5) to discharge from The Residence (60.7), and later discharge (65.0) from Yellowbrick.

Change in Global Assessment of Relationship Functioning (GARF): Family



"Yellowbrick saved my son's life. He was in treatment for depression and substance abuse. It took him 2-3 months to buy into the program, but he proceeded to gradually undergo a remarkable transition. Since leaving the program, he has been enrolled in college full time for almost a year and a half and is doing very well. He is approaching the 3 year mark in his successful participation in AA."

Parents of Yellowbrick Alumnus



Brain Studies

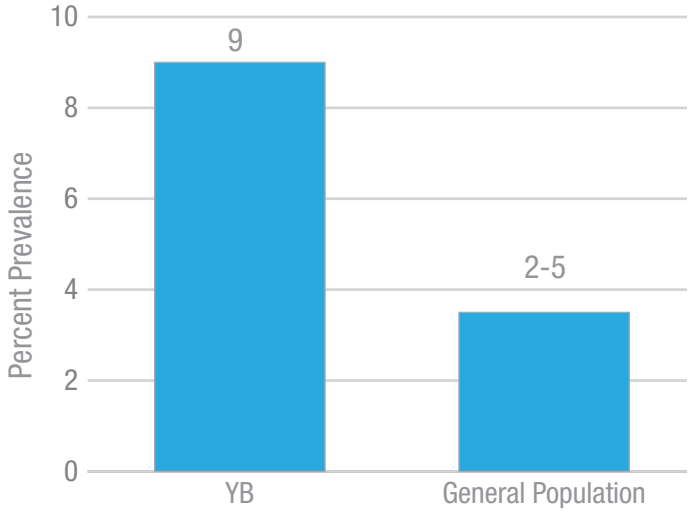
Every person who participates in an assessment or treatment at Yellowbrick receives a quantitative electroencephalogram (qEEG) in order to examine the underlying brain functions that correspond to the neuropsychiatric and behavioral symptoms he or she struggles with. These qEEG findings enable us to individualize treatment strategies and monitor progress in treatment. We also have the capacity to do MRI-PET studies in cases where there is evidence of traumatic brain injury on the qEEG or other clinical or medical indications for further structural and/or metabolic studies. Our findings show that emerging adults who come to Yellowbrick often have significant electrophysiological brain abnormalities that correspond meaningfully with their neuropsychiatric conditions and enable us to optimize their treatment strategies. Understanding these neurobiological abnormalities can improve treatment outcomes significantly. The illustration below shows an emerging adult brain with a qEEG pattern often seen in long-term, treatment-resistant depression, Brodmann area 25 in the anterior cingulate cortex (shown in red). This qEEG pattern, in a person with years of depression that has been unresponsive to a range of treatments, requires new approaches such as transcranial magnetic stimulation (TMS), psychopharmacology informed by pharmacogenomic analysis and innovative neuro-modulation interventions such as Alpha-Stimulation. These cutting edge diagnostic and treatment approaches are offered at Yellowbrick.

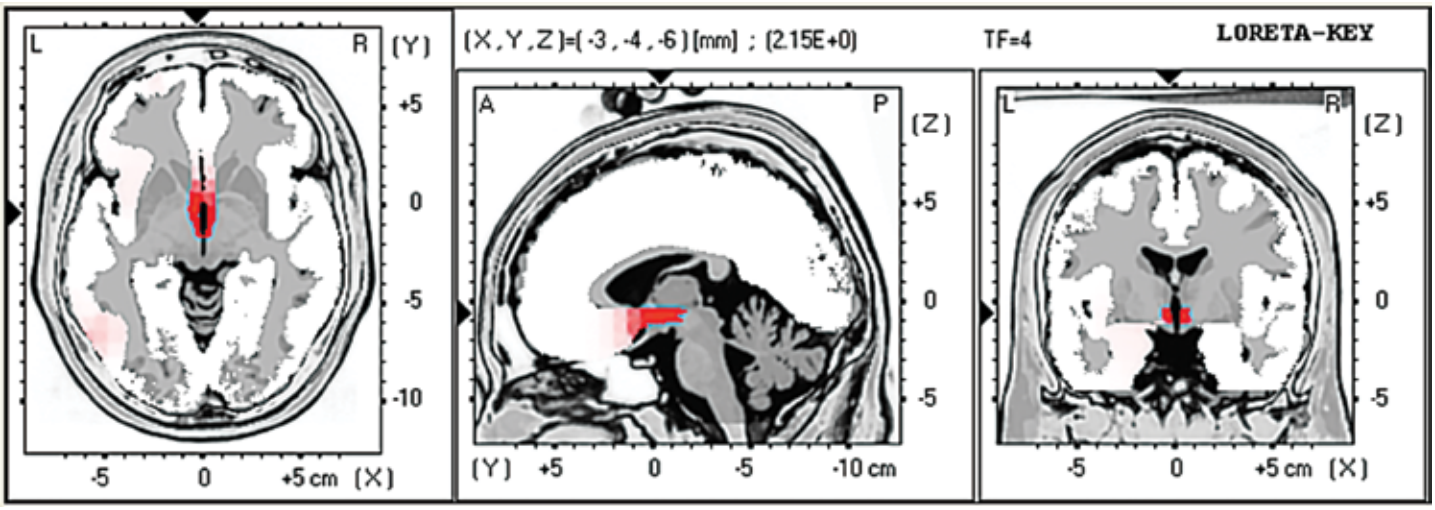
Genomic Testing

Pharmacogenomic testing is completed, using a saliva sample, during each Yellowbrick Assessment. It gives two types of clinical results: the genetics of the biochemical pathways in the liver that are specific to the metabolism of psychiatric medications (i.e. pharmacokinetics), and the genetics that influence the three neurotransmitters which influence receptor and enzyme functions in the brain for serotonin, norepinephrine, and dopamine (i.e. pharmacodynamics). These three neurotransmitters are essential to mood regulation and overall brain health. Nearly all of the Yellowbrick assessments, 91.3%, showed some clinically significant pharmacogenomic finding, with 73.9% having a pharmacokinetic finding and 69.5% a pharmacodynamic finding. Significant genomic findings directly influenced the choice and level of medications in 82.6% of the individuals assessed.

Poor Metabolizers of CYP-P450 2C19

Yellowbrick Compared to General Population





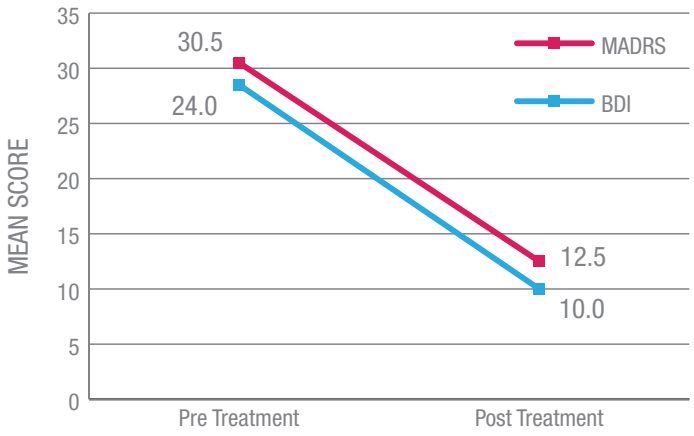
" It was not an easy decision for our son, or us, to commit to the program, but we are all grateful we did. While our son knew he needed help, he also was resistant to it. Yellowbrick was characterized by advances and setbacks, but he emerged from a depressed state, and left ready to take the next steps in his life. He is now in college, engaging with his peers and getting great grades. We are immensely appreciative of the dedicated efforts of all the staff at Yellowbrick ."

Parents of Yellowbrick Alumnus

Transcranial Magnetic Stimulation (TMS)

Repetitive transcranial magnetic stimulation ("TMS") is a non-drug, non-invasive and easily tolerated therapy that is FDA-approved for the treatment of Major Depressive Disorder. TMS treatment involves the rapid induction of a small electromagnetic pulse in the dorsolateral prefrontal cortex. Stimulation of this area produces an electromagnetic flux that reregulates healthy brain function both in the limbic system, the "emotional brain", and the frontal lobes, the "rational brain". Large-scale national research studies show that TMS leads to the alleviation of the symptoms of depression with almost no reported significant adverse effects. Emerging adults at Yellowbrick with severe, medication- and treatment-resistant depression can choose to receive TMS in addition to the other treatment modalities available. The findings for emerging adults who received TMS at Yellowbrick are very promising. As the graph to the right illustrates, on both the Beck Depression Inventory (BDI) and the Montgomery-Asberg Depression Rating Scale (MADRS), TMS led to significantly decreased depression in treatment resistant emerging adults. In fact, 75% of the treatment-resistant emerging adults at Yellowbrick met criteria for successful response and 62.5% experienced total remission of their depression on the BDI. Anecdotally, one of the two patients who were technically "non-responders" on both BDI and MADRS stated, "I don't care what those tests say. I know that the TMS saved my life."

Improvement in Depression with TMS



N=11; Pre-Post BDI p=.004; Pre-Post MADRAS p=.002

"We thank you for the tremendous support and care that the entire Yellowbrick team has given our family. Not only does our daughter have a very positive outlook, but we have learned a lot as well. We now all have a much better relationship from what we have learned at Yellowbrick. It was a life changing experience for all of us."

Parents of Yellowbrick Alumnus

Long-term Follow-Up and Future Directions

Long-term outcome studies are currently underway at Yellowbrick. Based on follow-up emails and visits, the majority of emerging adults continue to progress years after treatment. We are in the process of doing formal follow-up research on the emerging adults who have completed treatment. In addition, we continue to develop and examine neurobiological parameters of complex treatment-resistant problems in emerging adults. For example, we have developed measures of respiratory sinus arrhythmia (RSA) as autonomic indices of dysregulated emotional states in real time. These states of hyper- and hypo-arousal are frequently seen in trauma and anxiety and mood disorders. Tracking hyper- and hypo-arousal states in real-time can be used to enable emerging adults to better recognize and regulate their own emotional distress and ability to make rational, well-considered decisions and choices at such times. We are also investigating many questions related to psychogenomics, qEEG, MRI-PET, and TMS in emerging adults in treatment at Yellowbrick.

Why Yellowbrick?

Yellowbrick's treatment model is based on the core values of integrity, excellence in innovation and a commitment to life-enhancing outcomes. Yellowbrick offers emerging adults the opportunity to better understand themselves, access their strengths, develop necessary competence and actualize life goals.

Core Research-Based Features of the Yellowbrick Model Associated With Positive Outcomes Include:

- **Yellowbrick is a national center of excellence specializing in the treatment of troubled emerging adults and their families.** Yellowbrick is distinguished by the fact that treatment is delivered directly, and supervised daily by a team of expert, senior, full-time Yellowbrick professionals with decades of combined experience as clinicians, teachers, and program executives. This is integrated with a community process among peers that is a powerful vehicle for supportively confronting the necessity for change.

- **Yellowbrick's model of treatment evolves out of the latest research in neuroscience, developmental studies of emerging adulthood and clinical outcome studies.** Yellowbrick's treatment model has been developed in consultation with internationally recognized premier clinician-scholars. Assessment and treatment are in-depth but also practical. It is integrated into a coherent model for lasting change.

- **The Residence offers a developmental platform for those emerging adults who cannot move forward living at home, on campus, or in an independent apartment.** The program offers 24/7 skilled support and membership in the Yellowbrick community. The Residence provides a supportive adult presence which respects demonstrated effective autonomy, individualized programming for further development of life strategy skills, career and education services and productive activity in the Evanston community.

- **Yellowbrick utilizes neuroscience research to guide the pattern, rhythm and content of treatment.** Attention is paid to developing normal nutrition and sleep-wake patterns. Early morning interventions consist of individual support for developing effective self-organizational skills and daily-living/working patterns. Initial groups are designed for introducing gradual arousal, mind-body integration and a structured, goal-oriented, cognitive approach to the day. As the program proceeds, groups and interventions become more interpersonally and emotionally intense. Later there are opportunities to process and metabolize emotions and understand their personal meaning and impact on functioning. Evenings and weekends provide skilled support for developing the capacity to structure individual time, sustain inner vitality, socialize and play.

- **Treatment occurs within the context of deep, often intense, relationships with professionals, peers and families within the Yellowbrick community.** Neuroscience research demonstrates that effective emotional engagement in relationships promotes new learning and functioning, especially in the emotion-regulating capacities of emerging adults. This has been demonstrated by neuroimaging studies showing changes in actual brain networking.

- **Yellowbrick treatment occurs in "real-time."** This is akin to "strike while the iron is hot." The brain is best positioned for learning when there is a live situation with real responsibility and choices to make. Emerging adults at Yellowbrick retain their capacity to make symptomatic choices in response to their emotional experience. Treatment relationships provide a container within which they can better hold their tensions and be supported towards self-affirming responses. The primary purpose of staff presence is not to assume responsibility for preventing symptomatic behaviors but to be vitally present to guide new patterns of choice and experience. This is consistent with the neuroscience on new learning and targets the development of core competence in life skills.

- **Yellowbrick recognizes the complex transition occurring in the families of emerging adults.** Questions as to privacy, boundaries, autonomy and responsibility are confusing, especially in the face of at-risk behaviors. Families at Yellowbrick are involved in the assessment process and prescriptively throughout treatment. Yellowbrick's family model emphasizes an evolution towards adult inter-dependence balancing autonomy with connectedness. Emerging adults and families learn new ways of relating and communicating rather than revisiting family traumas.

- **Yellowbrick's culture and philosophy emphasizes a strength-based approach leading to competence—individuals are more than their illness.** A successful outcome means identifying, eliciting and collaboratively actualizing authentic core strengths, talents, goals, interests and motivation.

- **Traditional and alternative interventions** including psychiatric medicine, new findings from neurobiology, integrative medicine, evidence-based forms of individual therapy and small and large group psychotherapy, competence-based approaches, and family workshops.

- **Yellowbrick Foundation** has developed an extensive, unique clinical research program designed to study emerging adult development and treatment as well as track outcome. Yellowbrick's clinical research professionals are on the faculty of Northwestern Feinberg School of Medicine.

YELLOW BRICK℠

Changing the brain; transforming lives

FIND ***YOUR*** WAY HOME

1560 Sherman Avenue, Suite 400
Evanston, IL 60201
www.yellowbrickprogram.com
866.364.2300 x228
847.869.1515 Fax