REIMAGINING CARE THROUGH CONNECTED HEALTH

powered by AWS

electronic caregiver
HEALTHCARE INFRASTRUCTURE AS A SERVICE
OUR VISION FOR ENHANCED HEALTHCARE

- Technology-driven cost reduction
- Improved coordinated care through superior connectivity
- Virtual care support through next-gen UX and platform
- Seamless daily living insights to extract actionable data
- Unprecedented and captivating user experience
- Greater accessibility to patients, providers and families
- Increased patient engagement and life enhancing support
- Identification of best performing treatment standards
- Prevention-focused protocols to upgrade health outcomes
- Unprecedented scale and interoperability
HEALTHCARE CRISIS
WHAT DOES THE PATIENT WANT?

» Improved health and wellness
» Functional independence and lifespan
» The acuity to make positive changes
» Personalized care and attentiveness
» Quality of life

» Privacy
» Comfort
» Convenience
» Simplicity
» Affordability

HEALTH DECLINE AT GROUND ZERO: IN THE HOME

» Location of virtually all treatment non-adherence
» No visibility to changing health conditions
» No home-capture of incremental decline, incremental improvement, or treatment performance metrics
» Delayed intervention due to lack of insights
» Telehealth alone inadequate in coverage and capability
» Countless apps are inadequate and show poor utilization
The Caregiver Crisis Impacting the Young & Middle Aged

- Complex care plans with little support at home
- Aging population is doubling in size in short time span
- Risk of injury and complications due to comorbidities and lack of assistance
- Memory decline and loss of agility
- Trauma centers filled with 60+ patients, largely ground level falls
- Delayed response or intervention results in mortalities, hospitalization, and loss of independence
- Lack of behavioral health support
- Isolation, loneliness, and depression
- Falls are the #1 cause of injury deaths
- 1 in 3 seniors fall each year, costing $34B

The Aging Dilemma

- High rate of stress, insomnia, and stress related illnesses
- Lack of relevant education and support
- Isolation, loneliness, and depression
- Loss of income and opportunity
- Guilt over absence, or confusion during a medical event
- Estimated 52M non-professional caregivers in the U.S.
- 40% of the caregivers caring for patients with severe cognitive decline die before their patients.
- According to AARP, U.S. businesses lose up to an estimated $33.6 billion per year in productivity from full-time working caregivers
- 30B hours of informal caregiving occurs in the U.S. each year

THE AGING DILEMMA

THE CAREGIVER CRISIS IMPACTING THE YOUNG & MIDDLE AGED
Few technologies are designed for the care of children and their families

» Estimated 27% of children in U.S. have a chronic illness or disability (7-10M)

» Conditions usually require continual care and oversight

» 20-year climb in child and teen type 2 diabetes

» 6.8M children suffer from asthma with steady 30-year increase in cases

» Little support for parent caregivers of children with special needs, disabilities, or illnesses

» Lack of access to preventative education for children and parents
Mental illness can include, but is not limited to, depression, anxiety disorders, bipolar disorder, and PTSD. Mental health conditions are physical illnesses. Left untreated, mental illness can lead to catastrophic consequences. Mental illness affects people of all ages and frequently causes a detrimental impact on personal health and elevates the anxiety of caregivers. Around the world, two-thirds of people with a mental health disorder go untreated.
THE BARRIERS TO MENTAL HEALTH CARE

» Lack of understanding about the treatments or benefits of mental healthcare

» Shame and embarrassment about mental health conditions

» Fear of loss of anonymity, especially in rural environments

» Long waits to receive treatment

» Lack of quality, available professionals

» Logistical concerns regarding distance or transportation

» Cost of care

MENTAL HEALTH TREATMENT FAILURES

86% of health care expenses are for chronically ill patients
43% of chronically ill patients have a comorbid mental health disorder
74% of patients initially rely on their primary care doctor for mental healthcare
50% of patients receive a misdiagnosis by their primary care provider
OUR YOUTH

» The number of adolescents with diagnosed major depressive episodes has increased over 30% since 2005

» 1 in 5 young people - 20% of our youth population - suffer from mental illness

» Only 4% of the health care budget is spent on mental healthcare

» Suicide is the second leading cause of death for 10-34 year olds

» 70% of youth in the juvenile justice system have a diagnosed mental illness

» Family members lack understanding of how to identify and care for mental health conditions

OUR AGING

» 1 in 4 older adults experience a mental disorder

» The number of older adults with a mental disorder is expected to double from 7.5M to 15M by 2030

» Depression, anxiety, or addiction are not normal experiences of aging

» Isolation, lack of socialization, sleeplessness, and memory struggles increase mental health challenges

» Higher rates of diabetes, lung disease, cardiovascular disease, and other comorbidities reported

» 28% of seniors live alone; 45% of women aged 75 or older live alone

» Older adults represent 15% of the population, but represent 18% of suicide deaths
OUR VETERANS

» 1 in 4 experience a mental health condition

» Common conditions are PTSD, depression, and Traumatic Brain Injury (TBI)

» Often experience challenges in transitioning to civilian life

» Experience difficulty finding personal value and purpose

» Experience or witness high rates of trauma and disabilities

» Face inadequate access and support for mental health treatment

» 41% of Veteran’s Health Administration patients have a diagnosed mental illness or substance use disorder
1 in 5 adults experience mental illness each year (47.6M)

1 in 24 adults experience a serious mental illness each year (11.4M)

Depression is the leading cause of disability

Risk of developing cardiovascular and metabolic diseases increased by 40%

19% of U.S. adults with mental illness deal with a substance use disorder

Approximately 8.4M people in the U.S. provide care to an adult with a mental or emotional health issue

1 in 8 emergency room visits by adults involve substance disorder or mental illness

Serious mental illnesses cause $193B in annual lost earnings

Virtually no viable monitoring and data to validate best practices and outcomes of treatment

Majority of individuals with a mental health condition go untreated
TRANSFORMING HEALTHCARE
HEALTH INDUSTRY CHALLENGES CONTINUE WITHOUT REMEDY

» Estimated costs of $300B per year due to patient non-compliance

» Treatment non-compliance responsible for 50% of treatment failures

» #1 cause of non-compliance is reluctance to change behavior

» Lack of support in rural areas

» Gaps in care and patient oversight

» Unidentified conflicts of care

» Fragmentation of health platforms and information

» Unverified, inaccurate, or incomplete patient information

» Home care is cost-prohibitive to nearly all Americans

» 75% of increase spending from 2020 to 2037 will be for aging population

» 1/3rd of doctors at retirement age, combined with both nurse and caregiver shortages
HEALTHCARE REIMAGINED

1. Focus on the areas of highest risk and remove the blinders from ground zero (the home)

2. Address the most costly, resolvable, and obvious challenges first

3. Deploy technology to do the heavy lifting in the 24/7 ADL environment

4. Deliver affordability and scale through integrated technologies

5. Extract and disburse actionable, relevant data for prevention and continuum of care
Provide compatibility and versatility to connect existing infrastructures

Apply a UX that captivates and engages patients and caregivers

Provide continual education and support to patients and caregivers

Personalize care and direct precision medicine practices

Leverage our technologies for patient intake and care at institutional locations
WHO IS ELECTRONIC CAREGIVER?

OUR MISSION

To transform the home into a 24/7 connected health assessment and support environment, with the power to improve health outcomes and extend functional independence, while reducing the cost of care to make life better for patients and caregivers.
Electronic Caregiver® has designed cutting-edge, patient-centered, connected health solutions across the United States, positioned for global expansion. We deliver innovative digital health solutions that patients, caregivers, and providers engage and rely upon. Our mission is to affordably extend quality care methods to serve population health concerns with dedication to efficacy and outcomes. Our solutions come in five primary areas: prevention, chronic disease support, improved treatment adherence, elder care, and caregiver support.

Founded in 2009, Electronic Caregiver® has invested over $52M and 10 years into R&D, patient screenings, and the recent deployment of highly effective patient monitoring services. Our company occupies 40,000 sq ft of operational space with 150 employees. Our innovation department represents nearly 40% of our team, with 22 AWS-certified developers on staff and led by our CTO, a designated AWS Hero. Our operating departments also cover customer service, business development, marketing, accounting, and fulfillment. Electronic Caregiver® is partnered with hundreds of care professionals, including reputable homecare providers, hospitals, and physicians.
**RESEARCH & STUDY EFFORTS**

Electronic Caregiver® is focused on developing and participating in research efforts that support improved outcomes across the healthcare continuum. We know the critical importance of not only protecting our clients, but also verifying results through the ongoing development of research projects and studies. These efforts, as well as understanding stakeholder needs, drive our business strategies.

Electronic Caregiver® has the best technology solutions available to help serve our clients based on their needs and resources. Through the strategic use of our technologies, the goals of: increasing compliance; supporting successful transitioning of care from the facility to the home; supporting clients, providers, and family members; and reducing hospitalizations and readmissions are now attainable.

**CURRENT & SCHEDULED RESEARCH PROJECTS**

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<thead>
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<tr>
<td><strong>01</strong></td>
<td>A three-year study with G60 Trauma Center to evaluate readmission rates and quality of life for patients and caregivers.</td>
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<tr>
<td><strong>02</strong></td>
<td>Actively pursuing grant opportunities with G60 Trauma Center for those who need financial help in obtaining access to our technology.</td>
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<td><strong>03</strong></td>
<td>Leadership of a subcommittee of the Doña Ana County (New Mexico) Wellness Institute, focused on integrating care amongst disparate community health care agencies.</td>
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<td><strong>04</strong></td>
<td>A grant opportunity with local skilled nursing facilities, focusing on readmission rates after acute rehabilitation care.</td>
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<tr>
<td><strong>05</strong></td>
<td>A study with a large orthopedic group focused on post-surgical admission rates and recovery statistics.</td>
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EVIDENCE-BASED DEVELOPMENT

Research & Development

- 10 years of R&D
- 10 years of research collaboration with New Mexico State University
- 6 years of development collaboration with AWS
- Collaboration with hundreds of providers

Studies

- Thousands of patients screened in 32 states
- Scientific peer review (12 publications, 19 conference presentations)
- 3-year clinical trials with patients and caregivers, beginning Q4 2019
- Major medical center paper on successful reduction of readmissions

ACTIONABLE DATA & OUTCOMES ONLY

- Improve treatment adherence through 24/7 engagement and oversight
- Reduce hospitalization and complications through advanced intervention
- Reduce medication mistakes with innovative support and monitoring
- Reduce gaps and conflicts of care with enhanced data and protocols
- Reveal best performing care standards for improved accuracy and cost reduction
- Deliver relevant information quickly so patients, caregivers, and providers respond effectively
- Lower the cost of care while expanding accessibility
- Capture the actionable data that no other provider or tech company ever has
Today, the #1 mechanism of trauma related injury is falls in older adults. With the growing population of older adults until 2050, this number will continue to rise. Given the number of dependents to adult caregivers is increasing rapidly, there is an urgent need to explore innovative ways to assist in the care of our dependents.

While we recognize that caring for a person requires a human touch, there are also care needs that can be met with the help of technology. Addison, the world’s first virtual caregiver™, is a promising AI-based program that has been developed by Electronic Caregiver®. Through its technology, Addison has the ability to meet the needs of patients and caregivers (family members). From vital signs monitoring, to medication reminders, and 24/7 accessibility to healthcare professionals, Addison can potentially encourage treatment compliance, relieve caregivers from non-physical care needs (which in turn may reduce caregiver stress), ensure patient safety in the home, and much more. Healthcare professionals can also benefit through Addison’s technology, as it can potentially aide them in improving patient care, by alerting primary physicians of abnormal health status in a timely manner and allowing them to identify potential health related conditions at early stages.

Alicia Mangram, MD, FACS, CEO, G60 Trauma
Electronic Caregiver® and their products are proven to reduce hospital re-admissions and, further expanded, can save billions of healthcare dollars for Medicare and private insurance, as well as penalties for hospitals. The Addison Care solution will further enhance transitional and homecare services and improve patient outcomes. As a Chairman of the Board of a major hospital, I have confidence and great hope in these solutions for the future of care.

Prasad Podila, MD, FACP, AGAF
Chairman, Memorial Medical Center

As a research scientist, I am excited to begin the official clinical trials with Electronic Caregiver® and Addison Care. I anticipate a very positive impact on treatment adherence and patient outcomes, as well as improving health and reducing the stress of family caregivers. We will be observing the effects on both categories of participants.

James K. Dzandu, PhD,
Research Manager, HonorHealth
John C. Lincoln Medical Center

As the CEO of Zia Healthcare Services, LLC, I have seen incredible patient engagement using Electronic Caregiver’s Pro Health system. Over a test trial of 90 days, monitoring 50 patients at the beginning of the case study and 300 patients by the end, we were able to divert seven patients from admission to the hospital. Six of those were directly related to what we monitored; one was indirectly related to what was monitored. They had an infection that would have put the patient in the hospital. The physician was able to address the infection and keep the patient at home. We estimate a savings of just over $300,000 to Medicare.

Jeff Oldroyd,
CEO, Zia Healthcare Services, Inc.

If you are looking for a solution that shatters the status quo of in-home healthcare services, look no further than ECG’s Addison Care™. The team at ECG has created an integrated AI solution that is leading the way to improve the lives of our nation’s caregivers, the family members/patients they serve and doing so with dramatic cost savings within our nation’s healthcare system.

John L. Hummer,
President, Burrell College of Osteopathic Medicine
THE ECG SOLUTION
ELECTRONIC CAREGIVER PREMIER

Key Features

» 24/7 expedited response to concerns, injuries and medical events

» 24/7 monitored and logged medication and treatment reminders

» 24/7 live engagement for non-acknowledgment of reminders

» Personalized activity monitoring identifies anomalies

» Personalized plan of care features including automated voice symptom surveys

» Voice features using Amazon Connect and Lex

» iOS and Android caregiver connectivity interfaces

» Geo-location and caregiver messaging features

» Powered by AWS
ELECTRONIC CAREGIVER
PRO HEALTH

Key Features

» 24/7 expedited response to concerns, injuries, and medical events

» 24/7 monitored and logged medication and treatment reminders

» 24/7 live engagement for non-acknowledgment of reminders

» 24/7 live engagement for vitals reading failure

» 24/7 alerts and immediate engagement for vitals out-of-threshold

» 24/7 personalized plan-of-care features, including automated voice symptom surveys

» 24/7 auto-connect to Remote Patient Monitoring nursing staff for anomalies

» 24/7 access to physician-on-demand service nationwide

» Personalized activity monitoring to identify breaks in routine

» Voice features using Amazon Connect and Lex

» iOS and Android caregiver connectivity interfaces

» EMR integrated and HIPAA compliant

» Powered by AWS

Secure-provision vitals monitoring devices

Wearable for redundant emergency response

Pulse Oximeter

Glucose Meter

Spirometer

Non-contact Thermometer

Blood Pressure Monitor

Weight scale

Sim card-enabled portable health hub (no wifi needed)

Instant connection to physician-on-demand service

Two emergency response methods

Instant connection to physician-on-demand service
Virtual 3D Caregiver in dynamic 3D environment

Conversational speech and procedural speech enabled

Multi-function touchscreen with Amazon Sumerian

Ambient augmented reality

Access emergency response, physician, caregiver or customer service by voice or touch

Medication management with visual and audio reminders and directives

Medication consumption verification with visual sensing

Motional analysis for gait, balance, and fall risk assessments

Demonstrates devices for vitals readings with reminders

Demonstrates and measures rehab routines with reminders

Conducts in-home checkups

Extensive activity analysis capabilities

Physical and behavioral health enabled

Fitness and wellness routines included

Rapid iteration and deployment methods

24/7 emergency response

24/7 physician-on-demand

24/7 caregiver connectivity via iOS or Android app

Integrated console with far-field mic, sound, computing

Backup emergency pendant wearable

Edge computing

Sentiment analysis

Complex AI suite

Assesses health status, compliance, anomalies and care plan performance

Connectivity for localized services or social interactions

Includes SIM powered Smart Hub for redundancy during power or internet outages

EMR integrated and HIPAA compliant

Comprehensive Clinical Interface

Powered by AWS

Integrated console with far-field mic, sound, computing

Backup emergency pendant wearable

Edge computing

Sentiment analysis

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VIRTUAL CAREGIVING FOR MENTAL HEALTH DISORDERS BREAKS NEW GROUND FOR TREATMENT

Advanced, innovative Virtual Caregiving for mental health and substance disorders can affordably and systemically resolve numerous challenges. Virtual Care provides disarming accessibility to deliver competent, measured care support for those in need and those without alternatives. As an assistive tool, Virtual Care can fill the gaps in care by supporting patients, physicians, and family members with the encouragement, tools, education, and support they require to achieve successful outcomes. The platform brings mental health support to the masses.

Electronic Caregiver® Pro Health and Addison Care™ Virtual Caregiving solutions now come equipped with well-researched methods of intervention and service for mental health and substance abuse treatment needs. In the privacy of the home, our solutions help gently reveal the need for treatment. Our evaluation and care tools help patients and their families advance toward healthier lifestyles, to better understand their conditions, to discover the available options for expanded treatment, and to learn how to cope with care and recovery. Our solutions are expertly designed to provide virtual companionship, assessment, sequential steps and care directives, and to support treatment adherence and accountability. Our platform is also designed to help measure progress and identify the best standards of care.
HIGHLIGHTED FEATURES

Care Progress Report

» Ongoing wellness evaluations

» Quantifiable results presented in easy-to-understand graphic forms

» Assists in the continual monitoring and evaluation of treatment plan

Health Surveys

» DSM-5 validated assessment tool

» Medicare-reimbursable screening

» Identification of potential diagnoses

» Assists in the development of evidenced-based treatment plans

Screening Tests

» Simple and easy-to-use

» Results can automatically trigger further assessment

» Scalable for individuals and health systems

» Medicare-reimbursable assessment
HOME CARE WORKS
INTEGRATED DIGITAL HEALTH MODELS WILL BRING AFFORDABLE HOME CARE TO THE MASSES

1. Part-time home care reduces $25B in annual hospital costs
2. Part-time home care reduces annual employer health costs by $13.4B
3. Part-time home care reduces physician visits by 25%
4. Homecare provides doctors with valuable information that can improve treatment
5. Addison Care offers 24/7 support and can assess what human eyes and ears can’t
6. Addison Care expands the number of clients a caregiver can serve and transforms the business model
7. Addison Care can provide 24/7 support at a cost savings of up to 90% for many households
8. In a recent analysis, Electronic Caregiver® technologies reduced hospitalization by 47%
DESIGNED TO IMPROVE HEALTH OUTCOMES

» Affordable, scalable, effective chronic disease support
» Reduced hospitalization
» Substantial increase in treatment compliance
» Faster and improved recovery
» Identification of best standards of care
» Extended functional independence and lifespan
» Enhanced care coordination
» Superior actionable data insights
» Better care coordination
» Improved caregiver health and wellness
The costs of caregiving affect both individual workers and employers.

-AARP Public Policy Institute
AWS INTEGRATION
Electronic Caregiver® deploys serverless application, artificial intelligence, and IoT workloads on the AWS Cloud. Architecting innovation around the AWS Well-Architected Framework allows ECG to cut waste in healthcare, expand the walls of health practices, and provide better patient outcomes.

Lean service designs, capable of handling concurrent requests, allow ECG to create small re-usable services that scale infinitely. Utilizing log and access patterns, ECG can continually improve performance and provide better transparency down to the compute-second.

Verification

Protecting the Personal Health Information of Electronic Caregiver® customers is critical and so is maintaining a high level of trust around their privacy. Utilizing DynamoDB streams and AWS Lambda, ECG can verify identity with a conversational flow powered by Amazon Connect, ensuring the customer has provided consent before ECG displays any potentially sensitive data. In addition to the real-time flow, ECG is able to use this flow to automate verification of ECG privacy policies in support of a nationwide network of healthcare partners.

Agility

At the heart of Electronic Caregiver® infrastructure is AWS Amplify CLI, used to quickly leverage AWS services in web app development. This allows ECG developers to focus on app development and avoid complex backend management. To accommodate this agile design, ECG uses AWS CI/CD services to deploy Serverless Application Models as Cloud Formation stacks and utilizes a messaging layer to inform an automated testing process.

Deployment

ECG’s Virtual Caregiver™ Addison is deployed utilizing AWS Appsync to power our groundbreakingly accessible interfaces with GraphQL combinations of multiple data services, provided back to Addison users in real-time in both touch and voice interfaces.
RAPID RESPONSE INTEGRATION
UNINTERRUPTED MONITORING SERVICES

Electronic Caregiver® is seamlessly and securely integrated into Rapid Response Monitoring Service. Rapid has been providing uninterrupted monitoring services since 1992. Rapid Response Monitoring operates the industry’s preeminent monitoring service with mirrored reliability on both coasts: Syracuse, NY, a 75,000 sq. ft. headquarters facility, and in Corona, CA, a 35,000 sq. ft. full-load capable backup monitoring center. By offering tomorrow’s generation of monitoring technology today, Rapid is a quantum leap ahead of other security monitoring providers. Every aspect of their technology, infrastructure and operations is multi-redundant to work faultlessly and assure error-free, uninterrupted service.

**Rapid East**

Rapid East features four digitally controlled Caterpillar diesel generators. Two units supply 1.2 megawatts of secure standby power supported by independent 1,200-gallon fuel tanks and an additional two provide a supplemental 1.6 megawatts of secure standby power supported by independent 3,100-gallon fuel tanks. Additionally, four Liebert 150kVA Uninterrupted Power Supply units wired into quad-buss configurations provide unfailing power.

**Rapid West**

Rapid West features dual digitally-controlled Caterpillar diesel generators, supported by independent 1,400-gallon fuel tanks which supply 900 kilowatts of secure standby power. Additionally, two APC 100kVA Uninterrupted Power Supply units wired into a dual-buss configuration guarantee continuous power.

Rapid Response’s advanced network security systems at both facilities include dual Palo Alto Networks® and Barracuda Networks™ next generation firewalls installed in High-Availability (HA) Pair. Redundant Blue Ridge Networks™ crypto-servers create a VPN “cryptographic tunnel” for external remote access, providing some of the most advanced encryption in the world.