Grant Chamberlain joined Ziegler in 2015 as a managing director in the Corporate Finance Healthcare practice. With over 20 years of investment banking experience, Grant has advised some of the leading healthcare systems, including Sharp Healthcare, Cedars-Sinai, and Baylor Health, along with several of the most innovative telehealth companies, including IRIS, AirStrip, MDLive, and Voalte.

Prior to Ziegler, Grant led the mHealth sector coverage at Raymond James – which included telehealth, remote monitoring, and wireless healthcare solutions – after spending 15 years advising HCIT and tech-enabled outsourced services companies on a broad variety of M&A, joint ventures/partnerships, and private financings. Additionally, Grant has completed dozens of transactions in the physician practice management space with a specific concentration in oncology, having closed over 15 deals in that sector in his career.

Prior to Raymond James, Grant was a principal at Shattuck Hammond Partners, which was acquired by Morgan Keegan. He was also a part of the corporate finance group of General Electric Capital Corporation and the financial services division of GE Medical Systems.

In addition, Grant is an elected Director of the American Telemedicine Association (ATA), the leading international advocate for the use of advanced remote medical technologies. He is also on the Board of Directors for The MAVEN Project, which uses telehealth and a network of volunteer physicians affiliated with the nation’s foremost medical school alumni associations to improve healthcare access for underserved populations. Grant earned a B.A. in finance and investment banking from the University of Wisconsin – Madison.
It’s Just Healthcare
Over the last several years, virtual care has gained popularity, trust, and acceptance in the healthcare community. The sector continues to build momentum and its growth trajectory remains attractive for 2018 and beyond.

Since we published our first edition of “Deconstructing the Telehealth Industry” in 2016, the virtual care sector has hit a tipping point. At long last, and as evidenced by the points below, the sector is gaining widespread acceptance, proving its positive impact on the quality, cost, and availability of care, and increasingly becoming a visible, high-engagement tool in almost every aspect of the healthcare value chain.

• Health systems are increasingly adopting virtual care, helping to fuel the sector’s growth. According to a 2017 Foley & Lander survey of senior executives at hospitals, specialty clinics, ancillary services, and related organizations, over 75% of respondents said their organization offers or plans to provide telemedicine services.

• Within health systems, tele-stroke and tele-ICU have essentially become standards of care and tele-psychology will soon be as well, with many other “-ologies” knocking on the door. In a recent poll from The Sage Group, health system executives noted numerous specialties where telemedicine solutions have high potential to transform the standard of care, with the most popular responses being behavioral health/psychiatry, neurology, primary care, and cardiology (full Sage report available at http://go.sagegrowth.com/defining-telemedicine).

• Leading low-acuity/digital clinic offerings are gaining momentum as membership and utilization continue to grow year-over-year. These solutions are also gaining credibility, as they are beginning to provide tangible evidence that their diverse service offerings can re-direct patients from higher-cost settings.

• Virtual care is beginning to prove its worth in the form of savings. 71% of respondents to the previously mentioned 2017 Foley & Lander survey realized cost savings or ROI from telemedicine services and 54% realized savings above 10%.

• Recent legislation continues to indicate growing confidence in virtual care. In February 2018, a two-year federal budget was signed into law that eliminates geographic restrictions on tele-stroke consultation services beginning in 2019, expands telehealth coverage under Medicare Advantage Plan B beginning in 2020, gives ACOs more flexibility to use telehealth services, and extends for two years CMS’ Independence at Home demonstration, which establishes home-based primary care teams for Medicare beneficiaries with multiple chronic conditions, among other initiatives.

• The investment community has taken note of the sector’s potential and increased its appetite for virtual care and the broader digital health space. Venture funding for digital health companies in 2017 approached $6 billion and included eight transactions above $100 million, both of which are records.

• Third parties continue to validate the industry’s size and growth potential. According to a recent report by Zebra Market Research, the global market for telemedicine was valued at $18 billion in 2016 and is anticipated to grow at a CAGR of approximately 14% from 2017-2022.

As the virtual care movement grows, disagreements abound over how it should be used, who should use it, and even what to call it. Telehealth, telemedicine, eHealth, mHealth, and more titles have been used to name this sector. Ultimately, it’s just healthcare, delivered using new digital technologies. In this paper, we will use the umbrella term “virtual care” as our standard phrase of choice to describe this subsegment. However, we intend to demonstrate that given the wide variety of applications virtual care has for expanding access to care, improving its quality, and reducing its cost, it should not be pigeonholed or underestimated – ultimately, it is not a sidecar to the delivery of care, but a naturally integrated tool used to streamline the complex healthcare ecosystem.

Meeting Patients Where They Are
We believe the next generation of successful virtual care companies will be those who understand the critical marriage between chronic care management, behavioral health, and social determinants.

The United States (among many other countries) is facing a looming healthcare crisis: the aging population (age 50+) is growing rapidly, and this demographic is at a high risk for developing chronic illnesses which are often laborious and expensive to manage and are frequently compounded by behavioral health conditions. In recent years, 71% of total healthcare spend in the U.S. was associated with care for those with more than one chronic condition and 50% of U.S. healthcare spend was generated by 5% of the population.

As aging populations grow and the incidence of chronic conditions rises, healthcare costs are anticipated to balloon and demand for services will far outpace provider availability, thereby reducing access and leading to worse outcomes. This is a crisis that demands significant, immediate response from the healthcare system to make effective, holistic care for chronic conditions more accessible for large populations. A highly promising solution to enable a finite provider population to cater to the needs of a growing, complex group of chronically ill patients is broad adoption of virtual care.

Virtual care is uniquely capable of addressing chronic illness because it can meet patients where they are literally. Unlike many conventional models of care, it has the benefit of encountering patients at many points in their day-to-day lives, not just in physicians’ offices. This allows virtual care models to influence patient outcomes by addressing not only the physical phenomenon of a chronic illness, but also psychological and social factors that may be more apparent outside of the office environment.

Take the example of a patient with uncontrolled diabetes. He not only has physical symptoms of his disease to attend to, but also behavioral risk factors he may need to address, such as his diet and exercise habits. Further, he may face social and environmental factors that lessen his ability to comply with care guidelines, like living in an inner city neighborhood with scarce grocery stores and healthy food choices but plentiful fast food. If he lacks transportation to and from endocrinologist appointments or does not have a supportive network of family, friends, colleagues, and neighbors to help him attend to his care, the odds he will bring his diabetes under control are even lower. This patient, like most with chronic conditions, is not only in need of treatment for his body, but also support to reduce the impacts of behavioral and social risk factors.

The concept that the biological, psychological, and social components of wellbeing are deeply interrelated pieces of overall health and need to be addressed in a concerted, integrated fashion is called the biopsychosocial model of care. Unfortunately, conventional healthcare for chronic condition management often only addresses one or two elements of the biopsychosocial care model since it is limited to addressing what can be assessed in a physician’s office, leaving fundamental aspects of patients’ wellbeing ignored and underserved. These oversights and limited solutions lead to worse outcomes, higher costs, and greater suffering for all patients – especially those with chronic ailments, and most particularly those in the aging community.

Caring for all three aspects (biological, psychological, social) in an integrated way is imperative. The behavioral and social elements of care that can be difficult to detect during an office visit are innumerable and may include anxiety, depression, eating disorders; alcohol and drug dependency; dementia; air, water, and housing quality; availability of convenient transportation; strength of social networks and family stability; education and health literacy; and income. While these factors are not always easy to recognize in a physician’s office, they meaningfully impact whether physical symptoms of chronic disease can be managed. Virtual care is capable of addressing the entire biopsychosocial continuum for these patients by providing access to diverse caregivers – physicians, therapists, even family and friends – at the times and in the places where they most need them. Effective solutions can not only provide immediate acute medical care, but can also empower patients to care for themselves holistically, while giving care teams an invaluable 360-degree view into their most challenging patients’ needs. Enabling access to more diverse care options while enhancing patient-provider communication can help patients avoid dangerous and costly adverse health events.

The flexibility of virtual care is one of its greatest strengths. We hear all too often that there’s one “best/correct” way to deliver virtual care; fortunately, this is simply not the case. Video calls, phone calls, text charting, store & forward communication, IVR, adaptive clinical templates, and many other delivery models fit a variety of settings. Depending on
so too can both videocalls and text chatting have their places in the next generation of healthcare. No one medium is definitively right or wrong to use in virtual care, but different delivery methods may be more or less correct for different patients, providers, settings, and care needs.

the present disease state, acuity level, patient preferences, and available clinicians, different delivery modes may be more or less appropriate in varying circumstances, but can all be fittingly used in their own places across a continuum of care. Just as a scalpel and a stethoscope are valuable for different patients and different conditions in a conventional hospital,

the scope of services available via virtual care than this cohort, which is referred to in this paper as the “smart aging” population. The smart aging population is comprised of everyone from active 50-somethings wearing Fitbits to 90-year-olds in skilled nursing environments connecting with their physicians via videocall. This leaves ample room for innovation across a wide spectrum of needs. After-hours SNF virtual care providers have demonstrated the ability to treat over 80% of SNF patients in place using virtual care(9). This saves patients, their families, and payors the cost, stress, infection exposure, and poor outcomes associated with ambulance rides and hospital visits – which are typically the only options for these populations during medical crises when a physician is not on-site.

We believe there are three healthcare subsectors particularly primed for growth in the virtual care-enabled world: behavioral health, post-acute/smart aging, and chronic care management.

1 Behavioral Health

Behavioral health is a critical component of holistic healthcare treatment and is unquestionably the fastest growing sector within virtual care. Because behavioral health providers usually do not need to physically touch patients and many patients prefer to access behavioral health services discreetly, it is clearly one of the most obvious cases where virtual care can have an outsized impact. Additionally, tele-behavioral healthcare requires effectively no specialized investments beyond a simple video connection or similar tool, making it an inexpensive and easy foray into the virtual care space for many stakeholders.

• Industry participants are recognizing that solutions which provide analytically-driven engagement and seamless access to the appropriate behavioral health caregivers (psychiatrists, psychologists, social workers, drug counselors, nutritionists, etc.) can alleviate bottlenecks in acute care and emergency room settings. This helps solve one of this country’s biggest health crises: lack of consistent access to qualified mental health professionals in diverse locations and within numerous care settings (rural and urban hospitals, senior living settings, federally qualified health centers, clinics, prisons/jails, schools, etc.).

• Effective behavioral health treatments can help patients quickly and consistently address mental health challenges; adhere to care regimens for chronic and terminal diagnoses; and/or seek assistance or additional treatment. As such, behavioral healthcare is increasingly being recognized as a key component of proper chronic care management that can provide support, guidance, and structure.

2 Post-Acute/Smart Aging

Although the full virtual care sector has reached the “bottom half of the 4th inning,” we are only in the “top half of the 1st inning” when it comes to virtual care for post-acute/smart aging environments. Of all population cohorts, virtual care may ultimately offer the most value to this market. Post-acute care complexity continues to grow as financial penalties for readmission are levied against both hospitals and, soon, skilled nursing facilities; meanwhile, there are roughly 10,000 individuals turning 65 years of age each day(8). However, the lack of Medicare and Medicaid reimbursement for virtual care in post-acute/smart aging settings, when combined with these facilities’ poor financial performance, has slowed the adoption of some of the most obvious and impactful offerings.

• No demographic has more complex chronic conditions than those age 65+. Furthermore, patients in this population are susceptible to a variety of behavioral health challenges related to dementia, loneliness, and change of environment. With compounding social factors such as a shortage of geriatric care providers and a rapidly expanding aging population, this group is in great need of innovative, sustainable, and holistic healthcare solutions that extend autonomy and respect people’s dignity. As such, we believe no population is better situated to take full advantage of the scope of services available via virtual care than this cohort, which is referred to in this paper as the “smart aging” population. The smart aging population is comprised of everyone from active 50-somethings wearing Fitbits to 90-year-olds in skilled nursing environments connecting with their physicians via videocall. This leaves ample room for innovation across a wide spectrum of needs.

• While this population has been slower to adopt smartphones, they are increasingly using all kinds of technology, particularly “smart speakers” (e.g. Amazon Echo/Alexa, Google Home) to organize their daily lives, connect with support networks like family and friends, and manage their healthcare. As their digital literacy improves and technology similarly adapts to their needs, they will not be so vastly underserved by the virtual care sector for much longer.

• After-hours SNF virtual care providers have demonstrated the ability to treat over 80% of SNF patients in place using virtual care(9). This saves patients, their families, and payors the cost, stress, infection exposure, and poor outcomes associated with ambulance rides and hospital visits – which are typically the only options for these populations during medical crises when a physician is not on-site.

3 Chronic Care Management

The increasing prevalence of chronic diseases and recent legislation regarding virtual care reimbursement for chronic care management (“CCM”) are beginning to drive meaningful adoption of virtual solutions in this key subsector of healthcare.

• IRIS provides a remote diabetic retinopathy testing platform, which is a great example of how virtual care innovations can contribute to integrated CCM solutions that benefit all stakeholders. In IRIS’s case:
  a) Patients avoid scheduling an extra appointment (missed work, extra travel, need for childcare, new provider relationship) by completing retinal tests at their primary care physician’s office and prevent the development of a vision-threatening illness;
  b) Physicians engage with their patients in real-time about lifestyle adjustments needed to prevent retinal deterioration and receive payments from almost all payors for providing the exam;
  c) Payors may pay roughly 1/20th the cost for treatment if the disease is caught early versus in its later stages(10); and
  d) Health systems, which frequently see annual diabetic retinopathy testing compliance rates in the 30%(s) a huge HEDIS score problem across the industry, can use IRIS to move compliance rates to north of 80% in under a year(11). This improvement can create large value-based incentive payments that, along with current fee-for-service payments, can generate notable windfalls and new revenue models for primary care that once were not available.

Challenges Remain

While the virtual care sector has made tremendous progress over the last several years, challenges persist around commercial utilization, reimbursement, cost, and regulations.

• A large number of healthcare consumers have still not been introduced to virtual care. While commercial telehealth utilization has increased dramatically since 2014 (particularly for psychiatric and mental health services), a recent survey from Avista stated that 82% of respondents still do not use telehealth. Patients’ primary barriers to telehealth are not related to poor past experiences; instead, many have not had the opportunity to use telehealth services, are unsure how comfortable they would be with a virtual vs. in-person visit, and do not know if telehealth is covered by their insurance. Providers and managed care companies must keep patients educated and informed about their telehealth options to increase patient utilization(12).
Third party reimbursement remains a hurdle for many providers, and resolving these issues is likely to be an evolutionary process. A number of states have payment parity laws, but coverage and requirements for reimbursement can vary dramatically and often have complicated carveouts and loopholes. A 2017 survey by the Center for Connected Medicine and the Health Management Academy suggests organizations are optimistic about future reimbursement opportunities: of those respondents who were not receiving reimbursement in 2017, 71% expected to begin receiving reimbursement for virtual care in 2018. Additionally, increased virtual care adoption and growth will likely pressure payors to expand reimbursement.

Fortunately, legislative trends appear to be in favor of expanding reimbursement for virtual care, as indicated in the two-year federal budget that was signed into law in February 2018, described earlier.

Some organizations are hesitant to fund the upfront cost of virtual care programs; however, cost concerns appear to be dwindling as successful outcomes are achieved, clinical results with concrete ROIs continue to be published, and systems realize that virtual care is a necessary offering to maintain patient satisfaction and remain competitive.

Given the virtual care sector’s relative youth and cross-state nature, legal and regulatory policies related to patient informed consent, state licensure requirements, online prescribing, privacy and security, etc. are still evolving.

Ziegler’s Virtual Care Sector Map (p. 20-21)
One of the most popular components of our 2016 “Deconstructing the Telehealth Industry” whitepaper was the Ziegler Virtual Care Sector Map, which provided our view of the entire virtual care ecosystem on a high-level organizational grid. We have comprehensively updated the Sector Map in this white paper to include companies that have matured or recently entered the market, remove companies that have exited or been acquired, and further distinguish the industry into distinct subsectors.

The updated sector map reflects Ziegler’s unique vision of the entire industry as a number of discrete subsectors. At the highest level, we believe that virtual care is broken down into four categories: (i) clinical solutions; (ii) caring at home solutions – post-acute & smart aging; (iii) clinical sensors/CCM/wellness and data integration; and (iv) mobile clinical communications and care delivery productivity. The sector map includes examples of companies in each subsector. Key updates and developments from the 2016 sector map include the following:

- The behavioral health subsector in our sector map has been significantly expanded and segmented. As noted earlier, the private and discretionary attributes of a virtual care model along with the lack of “hands-on” tests make remote, “in-place” (e.g. home, office, etc.) behavioral health treatment an optimal use case for virtual care.

Overview of White Paper
Similar to our 2016 white paper, this document is structured around specific placemats which have either been updated or newly developed for this year’s paper. The goal remains to present our view of the virtual care industry in a concise format that will help various stakeholders envision the potential that the virtual care industry has in their business sectors. Taken together, we believe that these diagrams illustrate the ubiquity of virtual care applications in the healthcare industry.

The placemats are summarized below:
1. Driving Forces for Virtual Care (p. 10-11)
This placemat highlights the key characteristics of successful virtual care programs. It also provides a discussion of the historical barriers to virtual care adoption, recent favorable tailwinds, and the rapidly evolving future of the virtual care sector.

2. Virtual Care Programs Gaining Traction Across a Broad Universe of Stakeholders (p. 12-13)
Several developments have accelerated the demand for, and supply of, virtual care solutions. These trends are primarily influenced by the changing preferences, needs, and choices of eight key healthcare stakeholder groups: (i) consumers/patients; (ii) physicians; (iii) hospitals/health systems/the VA; (iv) employers/brokers & payors; (v) senior living/post-acute/hospice organizations; (vi) pharmacies/health retailers; (vii) digital clinical trials providers; and (viii) special uses, including schools and prisons. This section also lists the key goals of virtual care and discusses how achieving these goals addresses the challenges of the modern healthcare system as a whole.

3. Virtual Care in the Smart Aging Continuum (p. 14-15)
Traditionally, virtual care has been an effective tool for senior citizens (age 65+) in need of monitoring and/or long term care; however, the virtual care industry has expanded its aging-based solutions to the entire smart aging population (age 50+), providing new solutions for injury and illness prevention during midlife (proactive vs. reactive care). This placemat presents a more detailed view of the entire smart aging continuum and describes the role and function of virtual care in care four key smart aging segments: proactive care, aging in place, residential care, and other programs.

4. Use Case Spotlight: Virtual Care Applications in the ‘Smart Aging’ Sector (p. 16-17)
Multiple virtual care companies are beginning to “prove their worth” in the smart aging sector in the format of savings to patients and customers. This section lists four subsectors (after-hours SNF coverage, behavioral health, dermatology/wound care, and chronic care management) that are particularly relevant to smart aging and describes use cases and representative companies that have the potential to generate ROIs.

5. Virtual Care Ecosystem (p. 18-19)
We present an updated view of the virtual care ecosystem broken down by solution offerings; enabling tools, delivery mechanisms; channels/clients; and ultimately, payors – funding sources. We continue to specifically highlight the importance of data integration in connecting the various channels of virtual care solution offerings.

6. Ziegler’s Virtual Care Sector Map (p. 20-21)
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7. Key Virtual Care Participants: Partners, Investors, and Acquirers (p. 22)
This placemat presents a representative list of key virtual care partners and acquirers, as well as active strategic investors.

8. Key Virtual Care Participants: Health Systems (p. 23)
Integrated health systems, community hospitals, and rural/critical access facilities are becoming key participants in the virtual care industry. Multiple virtual care companies are beginning to “prove their worth” in the smart aging sector in the format of savings to patients and customers. This section lists four subsectors (after-hours SNF coverage, behavioral health, dermatology/wound care, and chronic care management) that are particularly relevant to smart aging and describes use cases and representative companies that have the potential to generate ROIs.

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- Given the volume of triage and senior living virtual care providers, we’ve created new sub-classifications to further distinguish companies within these sectors. We’ve also created a new smart aging subsector that includes senior living solutions, PERS, safety/wander/ALD tools, and mobile caregiver solutions.

- A number of new subsectors have been added to the map, including dermatology and wound care, dialysis, urology, digital pathology, women’s/maternity health, and pharmacy. We believe these subsectors represent innovative use cases for virtual care and exhibit strong growth potential.

- The sector map also includes descriptions of key transactions and notable trends within select subsectors.

We hope that this Ziegler Virtual Care Sector Map will continue to provide company executives, investors, employers, payors, and consumers a better understanding of the continuously evolving virtual care field.

9. Key Virtual Care Participants: Representative Market Leaders (p. 24)
This placemat presents brief profiles of the largest publicly-traded and privately-held virtual care companies: Teladoc and GreatCall, respectively.
## Key Elements

### Program Requirements

- Program champion
- Enrollment management
- Education and training
- Path to reimbursement/demonstrable ROI
- Care transition and coordination tools
- Appropriate use of mid-level clinicians
- Logistics management
- Reporting tools
- Secure, HIPAA-compliant solutions
- Measurability

### Stakeholders

- Patient
- Family/Member/Caregiver
- Neighbor
- Home Security
- Telecom/Cable
- School
- EMS
- Transport
- Physician
- Hospital/VA
- Prison
- Behavioral Health
- Outpatient Service
- Independent Living
- Home Health Care
- Skilled Nursing
- Hospice
- ACO
- Commercial Payor
- CMS
- HCIT
- HIE
- Broker
- Union
- OEM
- Device Manufacturer

## Characteristics of Successful Virtual Care Programs – Being Disruptive Without Being Disrupting

Stakeholder-specific virtual care programs optimize supply & demand needs – utilize scarce resources most efficiently

<table>
<thead>
<tr>
<th>Key</th>
<th>1 Easy to use and implement</th>
<th>2 Embedded within existing workflow</th>
<th>3 Analytically-driven engagement</th>
<th>4 Filters out the noise</th>
<th>5 Provides timely, relevant feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Creates</td>
<td>Program champion</td>
<td>Enrollment management</td>
<td>Education and training</td>
<td>Path to reimbursement/demonstrable ROI</td>
<td>Care transition and coordination tools</td>
</tr>
</tbody>
</table>

## Historical Barriers to Virtual Care Adoption – Significant Progress Made in the Last Several Years

- Adoption rates
- Competing IT department priorities
- Confusion regarding insurance coverage
- Cost
- Ease of use
- Establishing common terminology
- Hard to define ROI and lack of proven ROI
- Inconsistent ongoing compliance
- Interoperability challenges
- Lack of reimbursement opportunity
- Lack of single vendor, enterprise solution
- Medical establishment resistance
- Medical malpractice concerns
- Misaligned incentives
- Poor training and implementation
- Privacy and security concerns
- Regulatory hurdles
- Slow adoption of smartphones/technology by seniors
- Telecom infrastructure/bandwidth limitations
- Uncoordinated engagement efforts

## Recent Favorable Tailwinds

1. Need for more efficient delivery models
   - Increasing demand driven by large newly insured population and the Boomer generation moving into high healthcare consumption years
   - Looming provider shortages
   - Ongoing opioid crisis is driving demand for convenient care options, especially in rural areas

2. Payment models are better aligned to virtual care solutions
   - Shift from FFS to FFV
   - Increasing number of ACOs
   - Readmission penalties
   - Self-insured employers/payers offering incentives
   - Shift of economic burden to consumers

3. Proven use cases have become standards of care
   - Tele-stroke and tele-ICU are widely viewed as the standard of care; tele-behavioral health, tele-neurology, and tele-primary care are likely next
   - Demonstrated favorable outcomes and measurable, proven ROIs
   - Increasing MD, nurse, and patient comfort with technologies

4. Favorable reimbursement trends
   - FY2018 Medicare policy includes new/add-on codes for remote monitoring, virtual specialty, ongoing, and chronic care(5)
   - Recently passed federal budget expands Medicare Adv. coverage in 2020 and increases ACOs’ flexibility to use telehealth services (3)
   - Proliferation of low-cost devices that are secure and easy to use and integrate
   - Tablet and smartphone usage is outpacing other technologies
   - Smartphone adoption by adults aged 65 and over in the U.S. has nearly quadrupled in the last five years(9)

5. Acceptance and commoditization of virtual care-enabling technologies, from smartphones to wearable sensors
   - Shift of costs to consumers and growth of HDHPs are giving patients more influence over their care decisions; cost and convenience becoming factors when selecting care
   - 82% of consumers view digital solutions as the most effective way to monitor health metrics(14)

6. Increasing consumerism in healthcare
   - 50% of patients say they would be willing to pay more for care that is convenient, improves quality, or allows them to control costs

## Rapidly Evolving Future State

- Aligned financial incentives
- Artificial intelligence
- Avatars and robotics
- Big data analytics
- Digestible sensors
- Evidence-based medicine
- Gamification
- Genomic coordination
- Geo-targeting
- Implantable devices
- Measurable order sets and guidance
- MedApp formularies
- Predictive analytics
- Smart homes
- Virtual reality
VIRTUAL CARE PROGRAMS GAINING TRACTION ACROSS A BROAD UNIVERSE OF STAKEHOLDERS

VIRTUAL CARE SITS AT THE INTERSECTION OF EVERY SIGNIFICANT STAKEHOLDER GROUP IN TODAY’S HEALTHCARE SYSTEM:

CONSUMERS/PATIENTS
- Avoid the “unhealthy” setting of physician offices/urgent care centers/ERs/retail clinics
- Experience an unprecedented convenience factor – especially for low acuity/repeat illnesses and behavioral health
- High-deductible/high-copay plans making economics of even self-pay virtual care solutions very attractive
- Enhances ability to self-manage, track, and store health content
- Receive relevant, timely, and unobtrusive reminders and alerts to prompt behavior changes
- Strengthen communications with family members and caregivers
- Employer, payor, and pharmacy rewards programs drive utilization

PHYSICIANS
- Triage patients more efficiently – reduce no-shows and in-office wait times
- Manage/track chronically ill patients more effectively
- Enhance care quality and expand consumer options for care settings and modalities
- Improve Clinical Efficiency:
  - Ease impact of clinical shortages
  - Improve care coordination
  - Increase staff efficiencies – optimize mid-levels
  - Speed time to intervention
- Reduce Cost:
  - Deliver care in an optimal cost environment
  - Deliver tangible ROI

HOSPITALS/HEALTH SYSTEMS/VA
- Reduce avoidable readmissions and average length of stay
- Improve access to, and availability of, specialists
- Appropriately utilize and optimize mid-level providers
- Keep patients within a health system's network
- Triage ER demand more efficiently
- Manage/track chronically ill patients more effectively
- Improve care transition handoffs
- Differentiate brands and expand patient catchment
- Improve management of behavioral health patients
- Align with rapidly evolving shared risk models more effectively
- ACOs/PCMHs promote care delivery in the most appropriate setting

EMPOWER/BROKERS & PAYORS
- Improve wellness – drive specific programs/rewards
- Enhance productivity by reducing out-of-office time
- Counterbalance increasing employee financial responsibility in high-deductible plans
- Reduce overall healthcare spend with more timely, consistent delivery of care
- Improve employee satisfaction

VIRTUAL CARE GOALS

VIRTUAL CARE GOALS

EMPLOYERS/BROKERS & PAYORS
- Improve wellness – drive specific programs/rewards
- Enhance productivity by reducing out-of-office time
- Counterbalance increasing employee financial responsibility in high-deductible plans
- Reduce overall healthcare spend with more timely, consistent delivery of care
- Improve employee satisfaction

PHARMACIES/HEALTH RETAILERS
- Support adherence and compliance
- Position as the retail destination of choice for the virtual care wireless peripheral boom
- Pharmacies viewed as trusted advocates for virtual care apps
- Drive loyalty with rewards programs
- Kash as a hub for virtual care solutions
- Utilize retail pharmacy websites as trusted channels for driving adoption of virtual care solutions
- Access to wireless peripherals will drive new traffic into retail pharmacies
- Competitive differentiator

CLINICAL TRIALS PROVIDERS
- Drive medication adherence and promote formulary compliance
- Deliver content and educational material efficiently
- Broaden clinical trial catchment areas to improve access and compliance
- Identify and intervene in the case of adverse events with more speed, precision, and consistency
- Shorten time-to-market for new drugs
- Lower trial duration and cost
- Reduce staffing needs
- Enhance recruitment while improving patient retention
- Improve ability to track social and behavioral factors impacting trial participants

SENIOR LIVING/POST-ACUTE/HOSPICE
- Utilize scarce clinical resources more efficiently
- Avoid unnecessary hospitalizations/ER visits
- Manage/track chronically ill patients more effectively
- Increase medication and therapy adherence and compliance
- Create brand differentiation in a competitive marketplace
- Enhance caregiver/family member communication
- Gain the ability to measure changes in ADLs and vitals 24/7
- See early warning signs of health issues – engage in “proactive” vs. “reactive” care, including behavioral health
- Safety monitoring solutions increase patient security and family member/caregiver comfort
- Slow transition into more acute settings – reduce vacancy rates

SPECIAL USES
- Enhance care at schools and improve educational outcomes by providing access to remote acute care, behavioral health counseling, and hearing and speech therapy
- Supplement provider shortages during disaster relief efforts and connect people with providers who cannot physically reach survivors
- Increase access to primary and specialty care, as well as mental health services, for prison inmates; reduce high costs associated with transporting and guarding inmates in need of treatment
- Utilize teleministry services to provide spiritual support during end-of-life care and other times of need
- Provide accessible care options to more effectively address the opioid crisis and other public health emergencies
VIRTUAL CARE IN THE SMART AGING CONTINUUM

THE SMART AGING ECOSYSTEM ENCOMPASSES NUMEROUS CARE SETTINGS THAT PRIMARILY SERVE CONSUMERS AGE 50 AND ABOVE. WHILE A PATIENT’S ACUITY AND ABILITY TO PAY ULTIMATELY DETERMINE HIS/HER CARE SETTING, VIRTUAL CARE IMPACTS NEARLY EVERY ASPECT OF THE CONTINUUM.

Acuity & Age:
Low Acuity
- Age 50

High Acuity
- Age 90+

Typical Decision Maker:
Individual Choices

Family Choices

Likely Payor:
Self Pay & Private Pay

Medicare, Medicaid, Dual Eligible, Supplements

Primary Health Objective:
Preventative

Life Plan Communities – Residential Care Settings

Acute

Potential Care Options / Locations:
- Educational Content
- Wearables/Health Trackers
- Wellness Programs

Geriatric Assessments
- Senior Health & Wellness Centers
- Continuing Care at Home

Assisted Living
- Respite Care
- PACE Programs
- Memory Support
- Skilled Nursing
- Subacute
- Hospice

Virtual care has dramatically increased the ease with which patients can access proactive care options; for instance, detailed educational content is available online, screenings can be completed virtually, and fitness tracking wearables are ubiquitous.

PROACTIVE CARE

- Primarily utilized by consumers under age 65.
- Majority of care options are preventative in nature and serve to prolong one's healthiest years by educating consumers on health conditions and threats, encouraging healthy habits to avoid illness, and proactively screening and monitoring for health risks.
- Virtual care has dramatically increased the ease with which patients can access proactive care options; for instance, detailed educational content is available online, screenings can be completed virtually, and fitness tracking wearables are ubiquitous.
- Representative virtual care solutions include:
  - Wearables – Fitbit, Misfit
  - Wellness & coaching – Canary Health, Kurbo
  - Adherence & compliance – Ayogo, Fitango Health, Mango Health

AGING IN PLACE

- Care options are typically “want-driven;” many are intended to help patients maintain independence while also providing support systems to assist with activities of daily living or caregiving.
- Virtual care has transformed this care segment; solutions can now virtually monitor health metrics, facilitate regular patient communication with providers without an office visit, and guarantee “one-touch access” to emergency care — all of which enable independence and provide peace of mind to patients and their loved ones.
- Representative virtual care solutions include:
  - PERS – Connect America, GreatCall, MobileHelp
  - Safety & wander – Healthsense/GreatCall
  - Communication & engagement – Breezie, Care Angel, Careemerge, Independa, Seniorlink
  - Wearables & monitors – CarePredict, Spry Health
  - Mobile caregiver solutions – CellTrak, ClearCare

RESIDENTIAL CARE

- This segment includes “need-driven” clinically-focused care options for aging consumers who have likely experienced at least one adverse health event.
- Virtual care solutions can be particularly valuable to this segment, as they enable around-the-clock real-time access to providers and specialists (thereby preventing unnecessary ER visits and hospital admissions), enhance care coordination if a hospital admission is required, and help to keep family/friends in touch with aging loved ones.
- Representative virtual care solutions include:
  - Care coordination – Civic Health, Seniorlink
  - Afterhours care/provider services – Call9, Curavi, Satchel Health, TripleCare

OTHER

- The virtual care sector is expanding into “non-traditional” smart aging segments such as advanced directives/end-of-life caregiving and teleministry services. These offerings are still evolving and, while potentially quite impactful for the smart aging population, need time to gain widespread adoption.

Adapted from Greystone Communities’ Continuum of Care Chart
The Smart Aging Community has seen significant positive outcomes from implementing virtual care solutions in a few key subsectors; utilization is expected to expand within these niches and into new smart aging specialties.

**Virtual Care Applications in the Smart Aging Sector**

### Use Case Spotlight:

**Virtual Care Solutions Challenges**

<table>
<thead>
<tr>
<th>Challenges</th>
<th>Virtual Care Solutions</th>
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</thead>
<tbody>
<tr>
<td>• Lack of after-hours physician care in SNFs leaves nursing staff ill-equipped to handle complex patient episodes at night or on weekends and holidays.</td>
<td>Offers 24/7 virtual access to providers utilizing two-way audio/video technology and digital diagnostic tools.</td>
</tr>
<tr>
<td>• SNFs need convenient after-hours medical expertise.</td>
<td>Solutions have been proven to effectively treat a majority of patients who need after-hours care without transferring patients from their beds.</td>
</tr>
<tr>
<td>• “In place” general and emergency solutions – Offers remote monitoring solutions.</td>
<td>Patients can immediately alert caregivers when vital signs or other health measures are out of range.</td>
</tr>
<tr>
<td>• Shortage of after-hours physician care in SNFs leaves nursing need for coverage.</td>
<td>Remote monitoring solutions – Peripherals and platforms can immediately alert caregivers when vital signs or other health measures are out of range.</td>
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<tr>
<td>• Health systems face financial penalties for readmissions, so they favor discharging patients to SNFs with low readmission rates.</td>
<td>-notch senior patients is a growing concern across the smart aging industry.</td>
</tr>
<tr>
<td>• SNFs will begin facing financial penalties for readmissions in October 2018.</td>
<td>Behavioral health problems are becoming increasingly difficult to efficiently address in all age groups given a growing patient base, geographic limitations of patients, and provider shortages; the smart aging community may face heightened barriers to receiving care, such as a lack of caregiver education on the subject.</td>
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### Dermatology / Wound Care

<table>
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<td>• As skin ages it becomes more susceptible to injury/infection and heals more slowly.</td>
<td>• The smart aging community has a great need for skin and wound care, but limited access due to nationwide provider shortages and high proliferation of challenges such as lack of access to convenient transportation.</td>
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<tr>
<td>• Dermatological conditions ranging from frequent dryness and bruising to skin cancer are more common in the elderly.</td>
<td>• “Rapid access” dermat solutions – Allow patients to upload descriptions/photos of skin conditions at any time; providers then quickly turn around diagnoses.</td>
</tr>
<tr>
<td>• Without prompt treatment, skin ailments can cause discomfort and pain, and may be fatal.</td>
<td>• Especially helpful to diagnose minor conditions and triage serious cases in person visits.</td>
</tr>
<tr>
<td>• Wounds such as diabetic foot ulcers and surgical wounds may be especially difficult to treat in elderly skin; suboptimal or mistreatment of wounds can lead to severe and expensive long-term complications.</td>
<td>• Wound care solutions – Patients or providers can periodically upload photos and allow a care team to remotely track/monitor wound progress.</td>
</tr>
<tr>
<td>• Chronic wounds impact 15% of Medicare beneficiaries at annual cost of ~$28-32 billion.</td>
<td>• Solutions create quality outcomes; cost and labor savings; reduced risk; and higher satisfaction.</td>
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<td>• Dermatologist and wound care specialist shortages have extended wait times for skin-related treatments.</td>
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<tr>
<td>• In 2017, the average wait time in major cities for a routine skin exam by a dermatologist was 32 days – a 12% increase from 2014.</td>
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### Chronic Care Management

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<td>• Three in four Americans aged 65+ have multiple chronic diseases such as heart disease, high blood pressure, cancer, diabetes, and obesity.</td>
<td>• Mental illness presents an enormous and quickly growing challenge to the smart aging community.</td>
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<tr>
<td>• Patients with chronic conditions tend to be the heaviest users of healthcare, generating significant costs; 71% of total healthcare spend in the U.S. is associated with people with more than one chronic condition.</td>
<td>o Roughly 1 in 4 adults age 65+ are afflicted with a mental illness; those age 85+ have the highest suicide rate of any age group.</td>
</tr>
<tr>
<td>• Comprehensive care for chronic conditions is difficult to coordinate, especially for the smart aging population, which is particularly susceptible to chronic disease.</td>
<td>o As people age, increasing risks of dementia, loneliness, financial stress, and physical health worries can compromise mental wellbeing.</td>
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<td>• Whether aging at home or in a residential care facility, the smart aging community faces barriers to chronic condition management tools.</td>
<td>• Excessive use of psychotropic drug prescriptions to calm senior patients is a growing concern across the smart aging industry.</td>
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### Behavioral Health

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<td>• The smart aging community requires accessible mental healthcare at home and in residential facilities.</td>
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<td>• The discretionary nature of virtual care models along with the lack of “hands-on” tests required for behavioral healthcare, make “in-place” (e.g., home, office) tele-behavioral health visits an optimal use for virtual care, especially when convenience is a priority.</td>
<td>• Facility- and home-based virtual care solutions – Provide a virtual network of psychiatrists, psychologists, or social workers to deliver real-time, remote care/therapy sessions via video or phone.</td>
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<td>• “Chatbot” – “Always available” solutions use natural language processing to simulate a therapy session.</td>
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There is no single “right” or “best” way to deliver virtual care. The most effective modality for a given situation is often dependent on the care setting, available clinicians, the patient’s age, disease state, acuity, and his or her “technological comfort level.”

Strong data management and production of actionable intelligence from big data analytics engines will be key to virtual care's long-term success.

Analytically-driven engagement tools (increasingly enhanced by artificial intelligence and social determinants) will continue to drive more efficient utilization of virtual care solutions towards the optimal care setting.
ZIEGLER’S VIRTUAL CARE SECTOR MAP

**Clinical Solutions**

- **Hospital Based Solutions**
  - Advanced ICU Care
  - ART Indicators
  - Care Management Systems
  - Care Tech Systems
  - CPM
  - Critical Care Monitoring
  - Fall Detection
  - Health Cloud Applications
  - Healthcare Exchange

- **Behavioral Health**
  - Behavioral Health Platform
  - CAMAS
  - Care Management System
  - Care Management System
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- **EHR Integration**
  - CARE
  - CarePoint
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- **Clinical Decision Support**
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- **Omni-Channel Solutions**
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- **Patient Engagement/Navigation**
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- **Telemedicine**
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Health systems, community hospitals, and rural/ancillary access facilities are becoming key partners in the virtual care industry, with a few health systems differentiating themselves through virtual care adoption. The list and profiles below present select early leaders in the deployment of virtual care solutions across their networks.

**Virtual Access**
- **5.1 million appointment requests online**
- **85,000 video visits completed**

**Virtual Care**
- **2.2 million telehealth episodes of care**
- **4% growth in telehealth visits from veterans**

**Virtual Care Providers**
- **39.5 million remote visits to date**
- **91% satisfaction scores from veterans using telehealth**

**Virtual Care Results**
- **50% faster diagnosis-to-treatment for stroke patients**
- **59% decrease in VA bed days-of-care**

**Virtual Care Savings**
- **21.8 million prescriptions filled online**
- **Saves approximately $5 million per month through central monitoring units, digital clinics, clinical analytics, specialty telemedicine, scheduling, care coordination, 24/7 nurse line, ePharmacy, transfer center, and bed management**
- **Partners with American Well**
- **Offers a portfolio of evolving solutions that will progressively transform the health and care continuum**

**Virtual Care Partnerships**
- **55% decrease in VA bed days-of-care**
- **39% reduction in acute psychiatric VA bed days-of-care**
- **95% satisfaction scores from veterans using telehealth**

**Virtual Care Technologies**
- **50+ telehealth specialties for VA patients at 900+ sites**
- **85,000 video visits completed**
- **Began telehealth services in 1993 with eCARE**

**Virtual Access KPIs**
- **85,000 video visits completed**
- **2.2 million telehealth episodes of care**
- **50% faster diagnosis-to-treatment for stroke patients**
- **59% decrease in VA bed days-of-care**
- **91% satisfaction scores from veterans using telehealth**

**Virtual Care Cost Savings**
- **282 telehealth training sessions provided for providers**
- **3 modalities of telehealth training for veterans**
- **9.5 million lab tests avoided**
- **55% decrease in VA bed days-of-care**
- **39% reduction in acute psychiatric VA bed days-of-care**
- **95% satisfaction scores from veterans using telehealth**

**Virtual Care Impact**
- **21.8 million prescriptions filled online**
- **Saves approximately $5 million per month through central monitoring units, digital clinics, clinical analytics, specialty telemedicine, scheduling, care coordination, 24/7 nurse line, ePharmacy, transfer center, and bed management**
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Virtual care is a fast-growing sector that is already having an outsized impact on the healthcare industry. As virtual care continues to rapidly gain traction across a broad set of stakeholders, numerous positive tailwinds encourage fast continued growth and integration with mainstream healthcare. While virtual care has the ability to materially impact numerous subsectors of healthcare, we believe the following three domains are particularly fertile for disruption.

**Behavioral Health** – Millions of Americans suffer from mental health conditions but cannot access care due to their geographic location and/or economic status – issues which are frequently exacerbated by provider shortages. Virtual care solutions allow patients to access convenient, affordable treatment options with appropriate providers (psychologists, psychiatrists, social workers, drug counselors, etc.) while also alleviating bottlenecks in emergency rooms and other acute care settings. Given the lack of “hands-on” tests needed for mental health services, behavioral health has become the fastest growing segment of virtual care and will continue to gain traction as provider and provider awareness increases.

**Post-Acute & Smart Aging** – As the Boomer generation grows older, more consumers will look to “age in place” and will seek convenient, intuitive solutions that do not require constant visits to a physician’s office, they will greatly benefit if Medicare, Medicaid, and commercial payor policies evolve to provide broader reimbursement for virtual care services without excessively complex and confusing regulations. Comprehensive reimbursement that is easy understood will allow consumers and provider organizations to justify the cost of virtual care, increase awareness, and drive long-term adoption and utilization.

We are beginning to enter the “middle innings” of the virtual care sector’s evolution. The industry’s progress over the last several years is evidence; provider utilization has increased, standards of care have been redefined, and defensible ROEs have clearly been established. Sector leaders are beginning to emerge, as organizations who have achieved sustainable, established trust: developed safe and secure solutions, and demonstrated compelling use cases are scaling operations and establishing footholds as front-runners. That being said, there is still boundless potential for innovation and growth. Today’s healthcare industry is faced with unprecedented challenges and demands driven by population growth, insufficient access to care, and rising costs. The virtual care market, although still gaining traction, has proven to be a meaningful opportunity for innovation and growth.
ABOUT ZIEGLER CORPORATE FINANCE HEALTHCARE

Ziegler has long-lasting relationships with healthcare providers, information technology companies, financial sponsors, and other thought leaders across the nation, giving us unique insight into emerging trends and the future direction of the healthcare industry.

WHO WE ARE

Our team has an extensive track record of putting our client objectives above all else in closing transactions. As a result, we successfully deliver tailored merger & acquisition, capital raising, restructuring, and corporate partnering solutions, helping organizations identify and capitalize on exceptional and differentiated opportunities.

Ziegler’s team has an unwavering dedication to the healthcare industry and includes professionals with extensive healthcare and senior living investment banking, corporate development, operational, accounting, and entrepreneurial backgrounds enabling us to deliver unmatched advisory services to our clients.

PRODUCTS & SERVICES

We customize solutions to meet our clients’ strategic and financial objectives, and take a true advisory approach into our engagements and long-term relationships.

- Mergers & Acquisitions
- Sell-Side Advisory
- Buy-Side Advisory
- Capital Raising & Recapitalizations
- Fairness Opinions & Valuations
- Strategic Partnerships & Customer Development Initiatives

SECTORS OF FOCUS

- Healthcare Services
- Hospitals & Health Systems
- Healthcare Information Technology & Outsourcing
- Senior Living & Post-Acute Care
- Physician Groups
- Virtual Care

Ziegler is a privately held investment bank, capital markets, and alternative investments firm. Specializing in the healthcare, senior living and education sectors, as well as general municipal and structured finance, enabling us to generate a positive impact on the communities we serve. Headquartered in Chicago with regional and branch offices throughout the U.S., Ziegler provides its clients with capital raising, strategic advisory services, equity and fixed income sales & trading and research.