CHILMARK RESEARCH



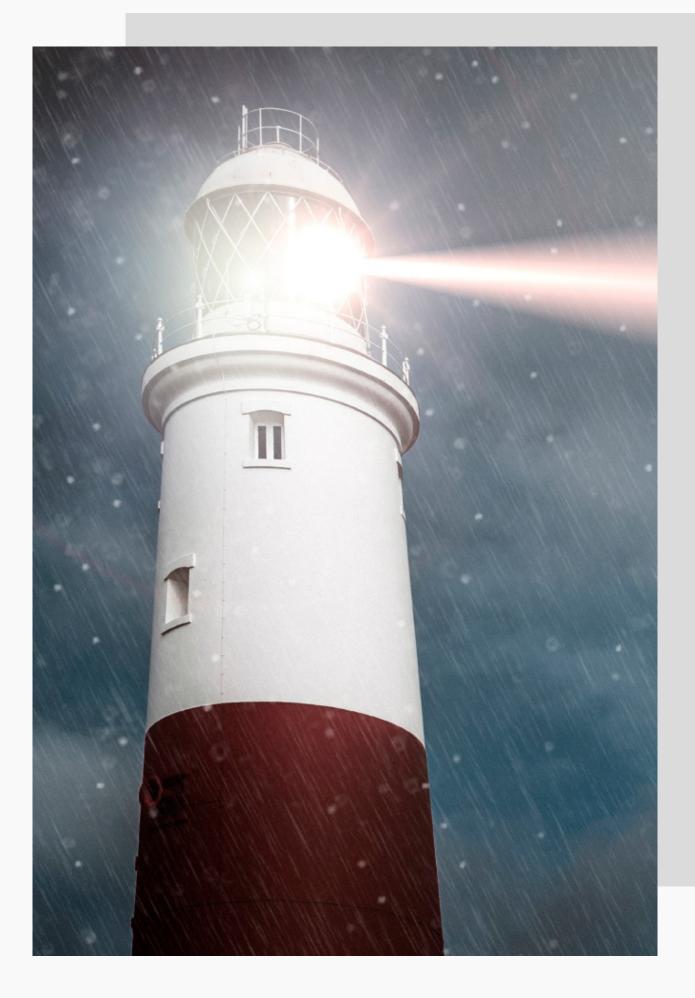
TECHNOLOGIES DRIVING IMPROVED HEALTH CARE EXPERIENCES CONSUMER-CENTRIC SOLUTIONS FOR A NEW

Ø LINK-SPOT

ERA OF CARE ADMINISTRATION







ABOUT CHILMARK RESEARCH

Founded in 2007, **Chilmark Research** is a preeminent global research and advisory firm focused exclusively on tracking the market evolution of healthcare information technologies (health IT) and use cases.

Our team is united by the belief that new health IT tools are critical for improving the quality and efficiency of care in a modern world. It is therefore our mission to foster the effective adoption, deployment, and use of these new solutions (and enabled services) through objective, high-quality research into those technologies with the greatest potential to impact care delivery.

This laser-sharp focus allows us to provide our community with the most in-depth, future-forward research on the critical technology and adoption trends occurring throughout the healthcare sector.

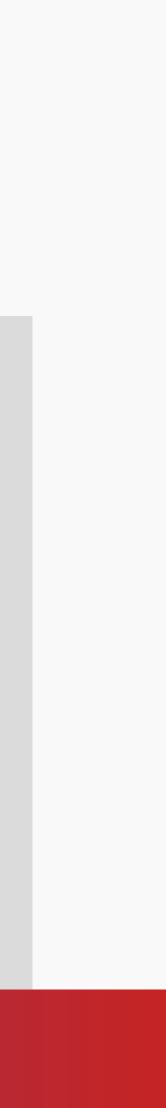


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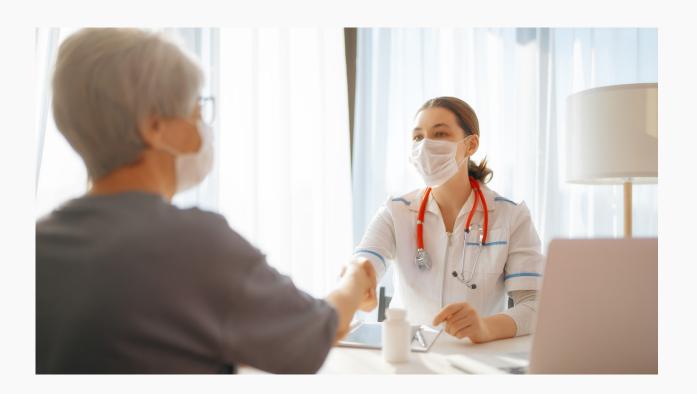
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KEY TAKEAWAYS



Building a convenient and easy-touse experience impacts every part of the patient care lifecycle

Engaged patients are healthier, proactively engage in healthy lifestyle habits, and on average utilize fewer healthcare resources. They report more satisfaction with their provider and will have better health outcomes measures.

For patients with multiple or complex diseases, or those who may struggle with a stigma associated with seeking care, a consumer-focused virtual experience can overcome these common obstacles and get patients access to the care they need.



Multiple reimbursement models stand to benefit from improvements from patient experience

The gains that can be realized from targeted experiential enhancements are not limited to value-basedcare (VBC) contracts and accountable care organizations (ACOs) alone. Fee-for-service (FFS) practices can also increase revenue and improve population health metrics by focusing on experience.

New patient recruitment and established patient retention is a source of revenue growth regardless of reimbursement model. Tools that facilitate and partially automate communications reduce operating costs, thereby increasing margin. They are also essential for helping to mitigate the burnout that is so pervasive among healthcare workers.



There is no going back

Access to virtual care services, self-scheduling, and a more involved, engaged level of interaction are among the biggest reasons patients cite for choosing a provider. Offering these experiences and options is becoming mandatory to compete for new patients and to keep existing ones.

Consumer style tools which can automate more of the patient experience and assist with engagement and outreach will be essential to preventing even more burnout and provider strain.





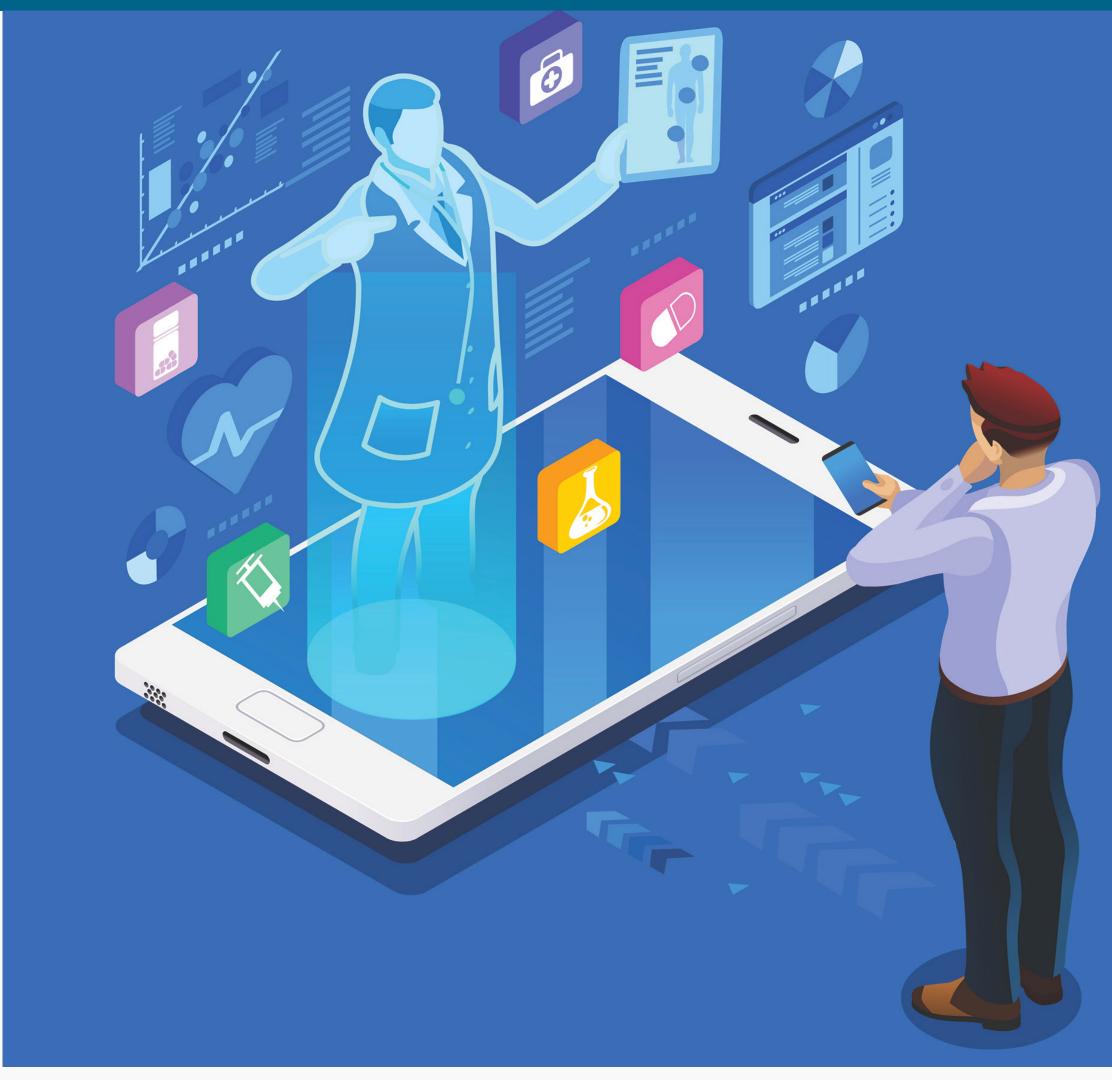




DEFINING THE CONSUMER EXPERIENCE

Essential Capabilities for the 21st Century Patient

- Intuitive patient/user experience
- Guided self-triage and care navigation
 - Physician(s) quality scores
- Real-time price transparency/co-pay based on plan benefits
 - Omnichannel access to clinician
 - Online scheduling
- Synchronous and asynchronous access
- Patient engagement tools
 - Educational resources, patient forums, remote patient monitoring functionality and portals, easy access to medical records (including clinical encounter notes)









DEFINING THE CONSUMER EXPERIENCE

Essential Back-Office Capabilities to Enable

- ▶ Simple, seamless integration with clinical workflows
- Customizable workflows and pathways
- ► API hooks for integration and deployment
 - Educational tools, patient forum platform, scheduling, physician quality scores, etc.
- Robust data capture for billing and validation
- ▶ Use of transparent AI/ML for clinical decisionmaking













PATIENT EXPERIENCE AND THE QUADRUPLE AIM

- Patient experience is integral to all four quadrants of the IHI/CMS quadruple aim
- Virtual care, revenue cycle, chronic care management, and provider workflows are interconnected
- Consumers expect options they can easily understand for scheduling, accessing care, communication, and out of pocket payment
- Consumer activation and automation are areas of focus for reducing administrative costs in particular

Improve patient care

Improve provider experience 👌

- Reduce burden of care
- Enhance patient-provider interactions
- Clinician resources working at highest level of license

Enhance quality of care Increase patient safety > Be the provider of choice

Reduce cost 0

- Reduce administrative task burden
- Lower operating cost
- Decrease average length of stay and frequency of ED visits

b Improve population health

- Promote access and decrease disparities
- Close care gaps
- Improve chronic disease management



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COMPONENTS OF THE CONSUMER EXPERIENCE





Digital Front Door

- Self-triage Al/chatbots ► Care navigation ▶ Eligibility Price transparency Self-scheduling
- Provider ratings



Consumer-Clinician Engagement

- ► Virtual care
 - ◆ Telehealth, remote monitoring, etc.
- Shared decision making
- Referral & prior auth.
- Clinical trials
- Al/chatbots





Patient Self-Care

- Patient-facing care management
- Patient-reported outcomes
- Educational tools
- ▶ Patient communities & forums

Analytics & **Benchmarking**

- Consumer/patient profiling
- ▶ Organization effectiveness benchmarking
- Provider effectiveness benchmarking
- ▶ Utilization, total cost management







BENEFITS AND ACTIONS TO IMPROVED CONSUMER EXPERIENCE



Increase Market Share

Proactively engage with consumers drawing them to your institution with intuitive digital tools

Be transparent by providing care navigation, provider look-up, scheduling and costs



Automate consumer-facing tools to reduce administrative costs

Provide patient self-care tools to reduce clinician burden

Define benchmark metrics to evaluate effectiveness of consumer engagement

Reduce Costs



Facilitate Engagement

Leverage omnichannel care to improve access and enhance clinician-consumer interactions and perceptions

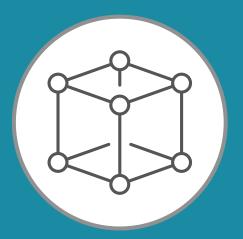
Enable shared decision-making capabilities with greater transparency into health status and activity







DIGITAL FRONT DOOR MOST CRITICAL COMPONENT



Leverages multiple IT applications to create an engaging and cohesive experience



Guides consumer to best care options for them



Metrics to continuously capture data and optimize engagement

Provider Directory & Ratings

Self-triage & Care Navigation

> Digital **Front Door**

Educational Tools

Omnichannel Care

Eligibility, Price Transparency & Scheduling









EVOLUTION OF CONSUMER-PATIENT EXPERIENCE

Organization Type	Conventional Approach
	> Call centers for scheduling
	> In-person check-in for access to physician
Provider Organizations	EHR-hosted patient portal for records
	Non-interoperable, disparate Apps
	Patient struggles with unified view of PHI
	Modest, app/platform-based services
	Focused on specific chronic conditions
Payers	> Trust issues lead to low engagement and ac
	Care navigation, some cost estimators
	Focused on reducing utilization and overall
	> App/platform-based services
	> Limited, same day, automated appointment
Retail (e.g,. Pharmacies, retail clinics, urgent care)	> Leverage competencies – Rx refill, immuniz
curics, urgent care)	> PHI may not be readily available for PCP, or
	Be first-line service provider in locale
	Mish-Mosh of apps and services
	 Address limited range of specific conditions
Self-Insured Employers	 Extremely difficult engagement prospects
	 Fragmented care offerings
	 Focus on steerage/care navigation

h	Future Approach
	> Digital automation tools for triage, scheduling and check-in
	Messaging for visit confirmation and wait time updates
	> Platform model with integrated data for engagement
	> Interactive tools, educational materials, etc. for patient self-care
	Online, curated support groups and forums
	Combined platform/app, real-time, and in-person services
	> Broader sets of chronic conditions and co-morbidities
ctivity rates	> Voice enabled, interaction driving improved engagement
l cost of care	Improved data-sharing between provider, payer and patient to automate/ facilitate access to appropriate care
	Combined platform/app, real-time, and in-person services
t scheduling	> Ubiquitous, same day, automated appointment scheduling
zations, etc.	Expansion of service offerings for all first-line health needs
r care team	Interoperable with other health service providers to provide unified care coordination
	Care navigation and first-line virtual care tools to lower costs
S	Expansion of disease specific apps and virtual care/coaching
	Full transparency and strong data governance to improve trust and engagement
	Migration to integrated data platform for fully interoperable apps and services to enhance value and foster engagement







GEN Z WILL DEMAND NEW LEVELS OF SERVICE



More Global

"With how social media spreads news around, we are very educated in how the world is"

Female, 20, US



Eager to Stand Out

"Generation Z is more focused on innovation and uniqueness"

Male, 19, China

Under the Influence

"I keep up with celebrities, influencers, and sometimes brands through Instagram"

"The experiences I have had, they do define me in a way - not so that I can show off about them, but what they have taught me is really valuable"

Male, 20, UK



Female, 17, US



More Demanding

"Brands need to work more to retain their customers. I would like it if they increased their offerings and make it easier to find things that you're looking for"

Female, 20, US



After Experiences



Pro Social (responsability)

"Ethics and message are most important to me... you cannot expect people to buy your products if your ethics are trash"

Female, 17, US



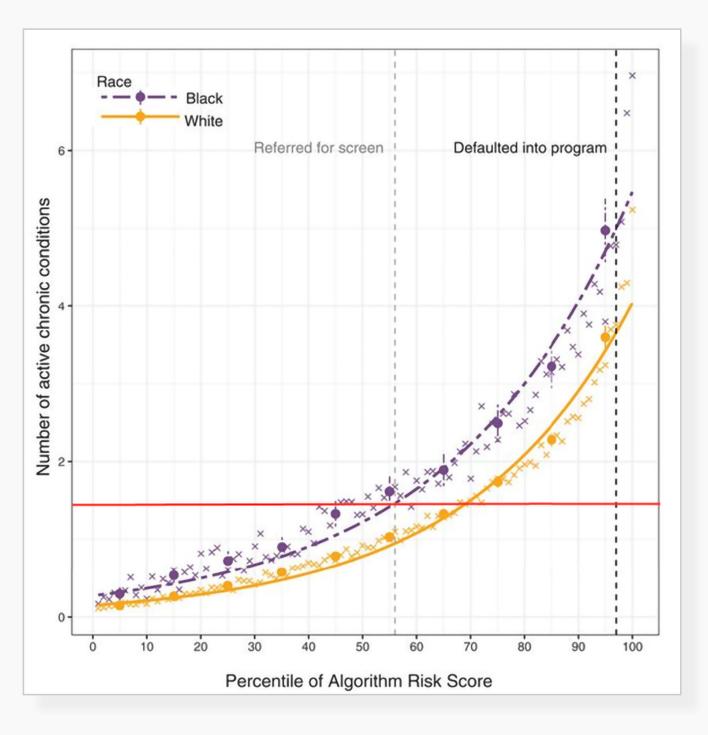




Call to Action CAUTION: DIGITAL ENGAGEMENT, **BIAS AND TRANSPARENCY IN AI**

Bias from many sources

- Algorithmic intensification of bias in historical data
- Bias within traditional 'best practices' or established institutional tools
- Flaws within AI/ML algorithmic design
- Poor choice of datasets as a representation of clinical or health outcomes
 - Increases overall cost, hurts clinical outcomes, damages provider trust in software, harms patient trust in providers
 - Explainability, transparency and a commitment to ongoing algorithm auditing are essential components needed to build and maintain patient and provider trust in solutions.
- Total cost of care risk score greatly underestimates the risk of African-American/ Black patients compared to White patients.
- Clinically similar patients are left outside the referral/management conditions.



Obermeyer, Z., Powers, B., Vogeli, C., & Mullainathan, S. (2019). Dissecting racial bias in an algorithm used to manage the health of populations. Science, 366(6464), 447-453. doi: 10.1126/science.aax2342







VENDOR CATEGORIES



Vendor Categories

INCLUSION CRITERIA FOR PROFILING

- Market maturity fully developed market vision and presence within this solution category
- Ability to present a development roadmap with a validated history of adding functionality
- ▶ At least 3 live customers and \$2 million in relevant annual revenue
- Can be effectively evaluated in the context of other similar solutions

Vendor Category

Vendors Profiled

EHR	Athenahealth, Cerner, Epic, Harris (formerly Allscripts)
Population Health	Change Healthcare, Innovaccer, Persivia
Best-of-Breed	Amwell, Bright.md, Gyant, Luma Health, Relatient, Salesforce, Qure4U, Teledoc/Livongo

Other Vendors to Watch

Cured., Gozio, Health Catalyst, Healthfully, NeuroFlow, Orion Health, Xealth





MARKET FORECAST



FORECAST NOTES

Projecting CAGR of 25% over 5 years

- Payers are largest market representing over 45% of market over forecast period
 - Primary objective: steerage to lower utilization costs
- At a 29% CAGR over forecast period, ambulatory and independent practices are fastest growing sector
 - Leverage consumer out-of-pocket spend, gain local market share
- Hospitals and health systems maintain their second place in consumer experience spend
 - Reduce administrative costs, gain market share
- Employers are smallest market but will triple investment in consumer (employee) experience solutions over 5 years forecast period
 - Steerage to lower utilization costs, lower employee out-of-pocket spend

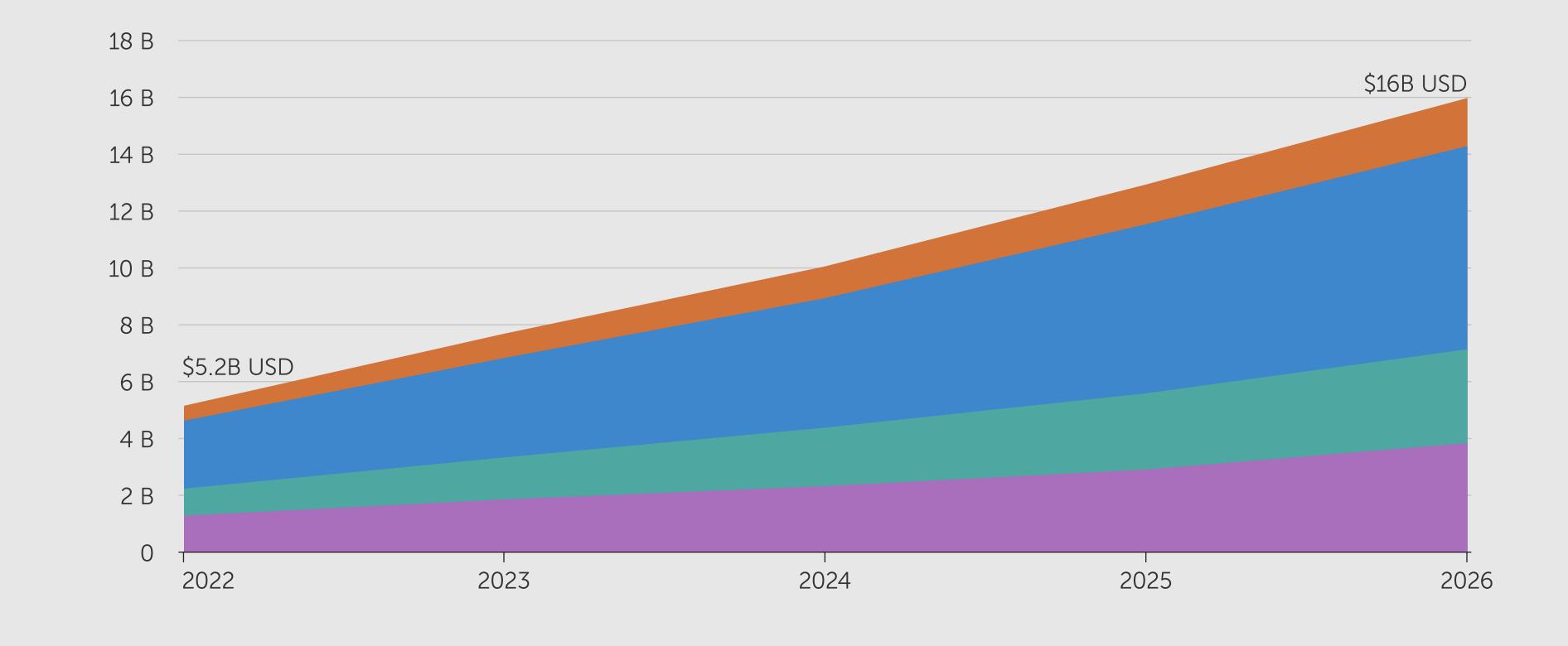




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FORECAST OF SPENDING ON THE CONSUMER EXPERIENCE







Traditional Buyers of Experience Products and Services





PRODUCT CATEGORIES AND DESCRIPTIONS

CAVEATS AND QUALIFICATIONS



16 Product Categories

- Engagement & Enrollment (4 categories)
- Patient Engagement (4 categories)
- Patient Self-Care (4 categories)
- Reporting & Analytics (4 categories)





Notes:

- The product categories we define in this market may not align exactly with existing offerings
- A vendor's offering may combine the functionality defined by us as discrete with other functionalities







Product Ratings

HARVEY BALL RATINGS KEY

- Every vendor receives a rating in every product category
- Most vendors do not offer functionality in every category
- Harvey ball rating is relative to all other vendors in report and product requirements defined in the broadest sense
- Letter grades are calculated relative to other vendors within the same vendor category, not relative to all vendors included in report.



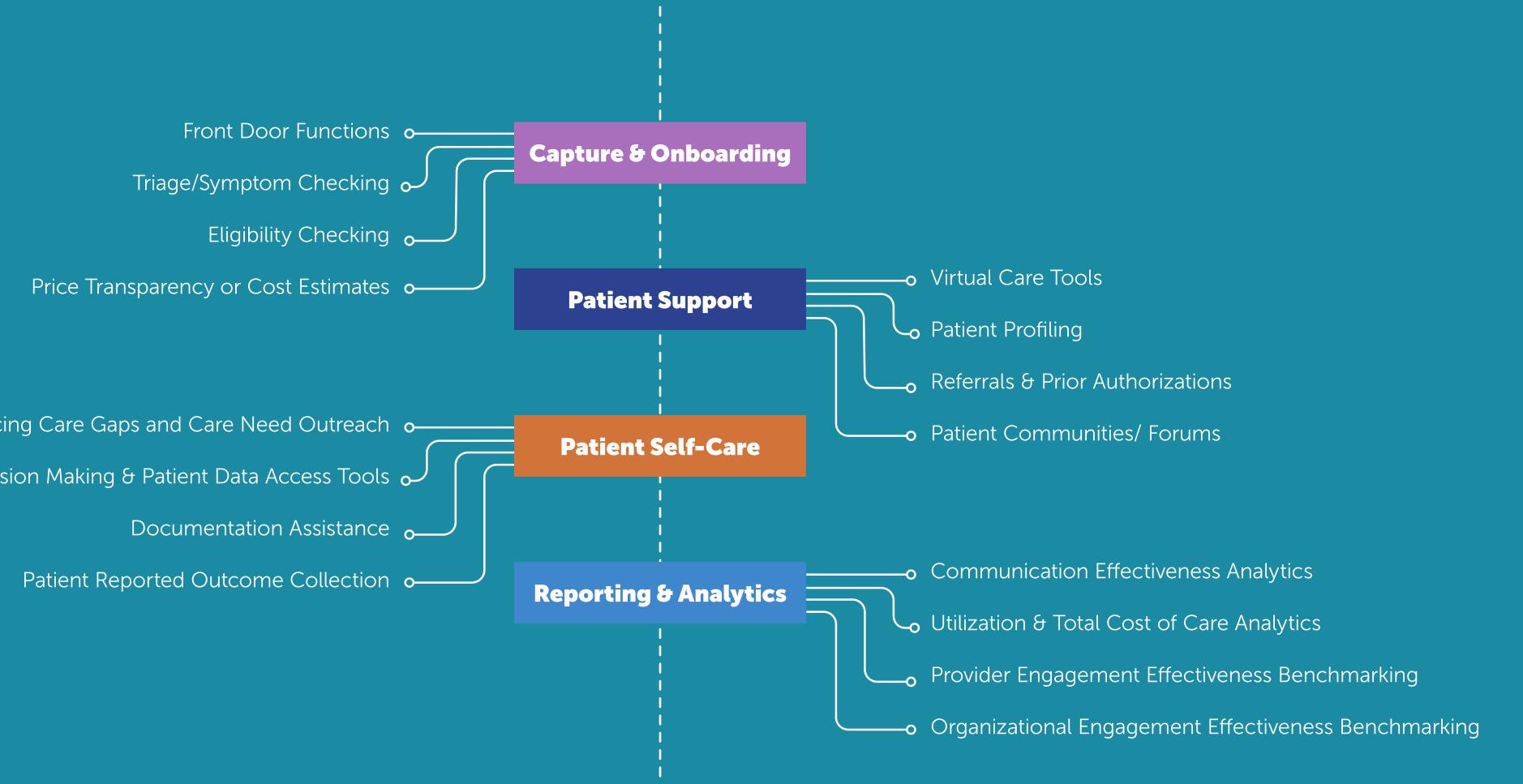


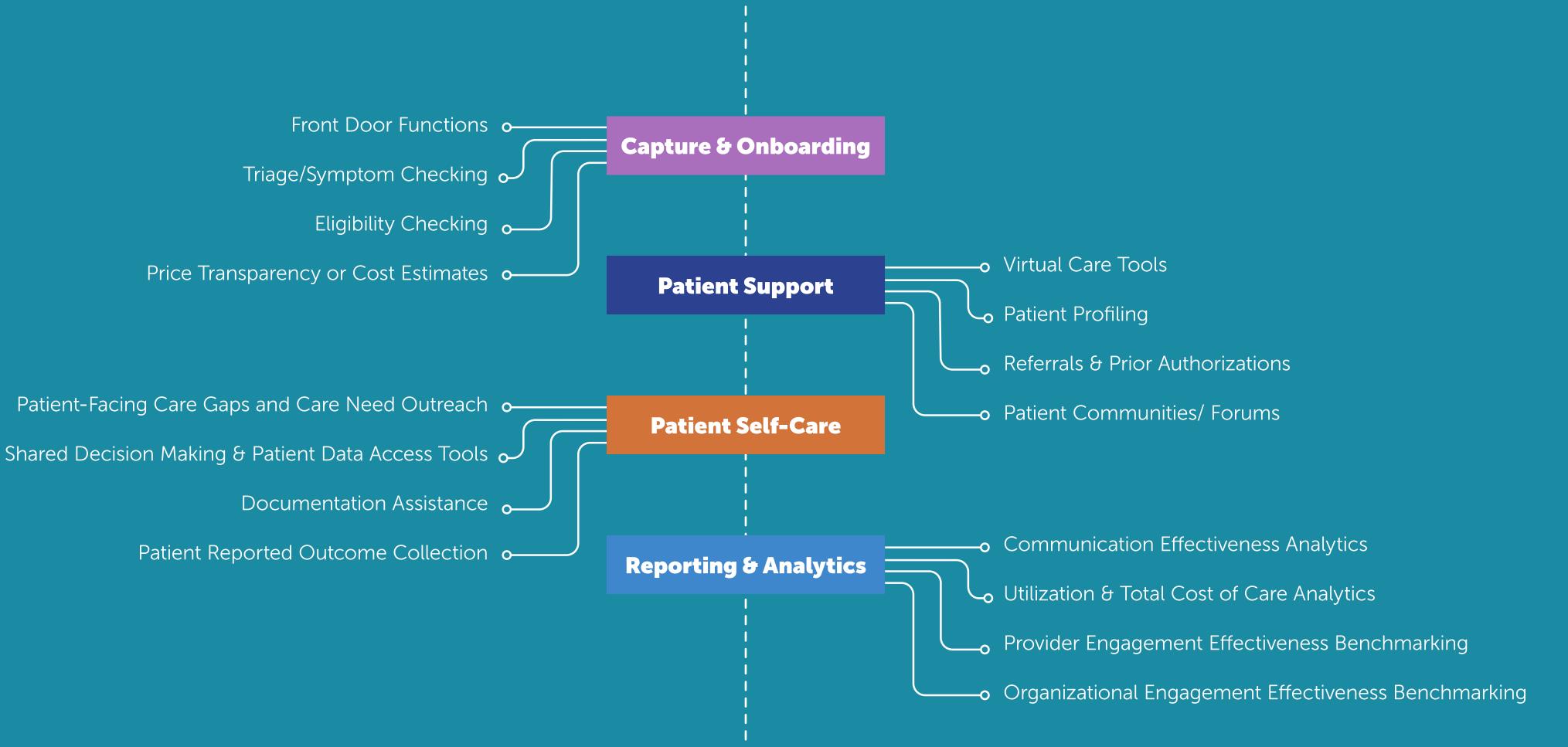






PATIENT CONSUMER EXPERIENCE PRODUCT RATINGS CATEGORIES













PATIENT CONSUMER EXPERIENCE: FLAGSHIP VENDORS

Capture and Onboarding



- MyChart Mobile is becoming more than just a portal app to enable more patient-initiated and patientdirected experiences
- Integrations with 3rd party tools within a single UI/UX and data infrastructure are especially effective

Patient Support



- EHR-integrated tools directly within provider/patient workflow
- Improving UI/UX both for providers in the EHR and patients in MyChart, esp MyChart Mobile
- Excellent combination of patientfacing, virtual care, education, outreach/engagement tools within an existing infrastructure

Patient Self-Care



- Leverages automation for effective patient engagement. Excellent UI/ UX
 - Allscripts FollowMyHealth- A wellexecuted portal replacement app
 - Good combination of scheduling, engagement, interactive tools

Reporting & Analytics



- Combination of organizational reporting and broad crossorganizational benchmarking
- Easy to build and read dashboards and reporting on both excellence and potential improvements
- Applications of AI/ML to provide not just current state reporting, but recommendations for next actions and potential strategies







PATIENT CONSUMER EXPERIENCE: RUNNER UP VENDORS

Capture and Onboarding

O TELADOC

- Combination of care, engagement, collaboration, and outreach driving patient enthusiasm and longitudinal use
- Joint focus on linking usability and familiarity with important clinical functions
- Engages patients with education, independent activity, and interactive learning and coaching for best possible longitudinal care outcomes

Patient Support

- Excellent combination of front door tools and virtual care tools. Combines patient needs for scheduling, payment, engagement with RPM, coaching, asynchronous care
- Integration and rollout focus for long-term use and support of progression into virtual care
- EHR-agnostic platform to integrate workflows and experience within a single model

Patient Self-Care

Reporting & Analytics

- Combination of chronic care management, acute needs, behavioral health, and virtual primary care
- Integrates interactive AI/ML driven activity with asynchronous messaging and responsiveness.
- Good design with emphasis on intuitive UI and usability

Cerner

- Strong AI/ML tools (but see above)
- Powerful CRM tools (but see above)
- Good organizational focus on home health/hosp@home enablement and patient-initiated interactions









Capture and Onboarding

Innovation

Front Door Functions	Patient scheduling, check-in and arrival tools
Triage/Symptom Checking	On-demand recommendations or care suggestions
Eligibility Checking	Provide easy access to in-network providers and minimize unexpected costs
Price Transparency or Cost Estimates	Provide total cost of care estimate

Description

Tools to direct patients to a care center or assist patients in selecting a doctor. Tools for allowing patients to check in for an appointment or procedure remotely. Can include COVID symptom clearances, needed documentation, pre-appointment screenings, virtual waiting rooms. Create patient and payer billing or integrate with billing systems to support billing for care activities. Allow appointment requests and/or self-scheduling for in-person or remote encounters. Tools for canceling or rescheduling appointments. Provides patients with appointment reminders or access points for remote care

Provide remote symptom checking and triage tools using clinical algorithms or AI/ML models, including chatbots. Includes functions that direct patient activity or assist patients in navigating to a care setting. Does not include the aspects of a workflow which routes patient interactions to a provider for review

Tools offering either batched or real time eligibility checks to provide information to patients and stuff about coverage and costs

Tools providing estimates or actual billing amounts to patients prior to scheduling an appointment or procedure







Patient Support

Innovation

Virtual Care Tools	Real-time remote encounters
Patient Profiling	Personalized patient outreach
Referrals & Prior Authorizations	Seamless referral/prior authorization workflow
Patient Communities and Forums	Automated communication customized to the specific needs of a group

Description

Real-time appointments using voice or video technology. Includes telephonic, web, and chat encounters

Creation of a patient profile for analysis, communication, and risk assessment. May include clinical, SDoH, communication preferences, and other data to create a full patient context

Tools assisting in the process of referrals or prior authorizations, through automation, data collection, or other methods. Can also include tools which identify when additional insurance workflow is needed, informs patients or providers, and provides updates on processing and approval

Tools supporting provider-, vendor-, or patient-organized communities or other mutual communication based on diagnoses, care needs, or other factors









Patient Self-Care

Innovation

Patient-Facing Care Gaps & Care Need Outreach	Provide education and assistance in personal healthcare needs
Patient Reported Outcome Collection	Patient responses to changes in status or heal
Documentation Assistance	Leverage AI/ML or other tools to reduce provide workload and improve documentation
Shared Decision Making & Patient Data Access Tools	Provide education, training, or activities to patients as part of an active care program

Description

l	Communication, outreach, or other tools to communicate with patients about identified care gaps or needed patient activity. May assist with resolving the needs through appointments, scheduling, or other methods
alth	Allow patients to report symptoms, medication reactions, or changes in status to care teams, and/or prompts patients for feedback at clinically necessary points
/ider	Assists providers or staff with suggestions for notes or other documentation, or automatically creates preliminary notes or documentation for provider review
	Allow patients to review treatment plans, diagnoses, histories and other data. Patient/caregiver access to test and exam results, provider notes. Access to medication list, refills, medication information. Deliver patient-specific and/or condition-specific educational materials or other interactive activities. Monitors consumption and use, and reports on efficacy. Suggests educational or interactive content based on efficacy. Tools for assisting patient enrollment in clinical trials or experimental treatments or allowing independent patient enrollments.







Reporting & Analytics

Innovation

Communication Effectiveness Analytics	Provide transparency into the impact and effects of a software solution	Tools and reporting to communicate how effective campaigns, communication, and outreach are
Utilization & Total Cost of Care Analytics	Provide transparency in cost per patient	Ability to analyze and calculate the amount of services a patient is using and the effects of the total cost of care
Provider Engagement Effectiveness Benchmarking	Provide transparency into the providers to patients communication	Reporting and analytics showing how effective individual providers are at engaging with patients and/or comparing to benchmarks
Organizational Engagement Effectiveness Benchmarking	Provide transparency in educational and management software solution	Reporting and analytics showing how effective an organization or organizational subgroups are at engaging with patients, and/or comparing to benchmarks

Description







VENDORS TO WATCH





Marketing & CRM-built platform with the compliance, data model, and out of the box interactions needed to support every step of a healthcare consumers journey.

Built-in library of healthcare-focused content, audiences, and automations to create the engagement.

In-patient and in-office focused digi tal front door. Wayfinding, appointment directions along with tradition telehealth, scheduling and messagir functions.

Good analytics based on their focus What do patients search for, what's being used.

Growth in integrations and APIs provides exciting opportunities, excellent example of eliminating the boundary between in-person and virtual care.



i-	Health Catalyst is a data, analyt- ics, and decision-support plat-
nal ng	form. Integration into Data Operat- ing System offers excellent visibility into patient activity, needs, profile.
S:	Twistle acquisition brings sophisticated care pathways, design tools, and automation functions.

DOS offers good care gap and care need analysis for outreach and engagement activity.



Pre-built integration platform allows seamless interoperability across an organization's existing enterprise solution. This includes EMRs, EHRs, ERPs, Payors, Payment Networks, Data Warehouses, and existing Identify and Access Management services.

Patient engagement functions including: intake and registration, scheduling and appointments, payments, patient activation, virtual care, telehealth and remote patient monitoring (RPM), behavioral health, social determinants of health, and wellness programs.





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VENDORS TO WATCH

INEUROFLOW

Addresses a breadth of needs and care options in the behavioral health space Excellent tools and UI for patients, providers, care teams.

Provides active insight into patient activities and recommends activities and strategies for both patients and providers.

Leverages AI/ML and NLP to analyze patient responses and engagement patterns. EHR data integration for workflows, data injection, assisted documentation.



ML/AI powered digital front door that addresses fragmented consumer experience by multi-channel interface through which all interactions can occur including symptom assessment, trusted health information, electronic referrals, access to complete medical records, virtual care and remote monitoring.

ked th

A platform that aggregates and organizes digi tal health tools and patient monitoring while
 consolidating reporting and analytics across
 patient populations and physician groups.

Xealth Digital Command Center houses customized reporting and analytics of patient and provider engagement. Enables measuring outcomes collection of different prescribed content, apps, services, and connected medical devices across the entire system.







APPENDIX A

Methodology

- To compile this report, Chilmark Research combined extensive primary and secondary research techniques to create a composite profile for each vendor.
- Primary research was divided into two distinct steps, beginning with soliciting targeted vendors for their involvement in the research.
- We asked participating vendors to complete a questionnaire whose purpose was to collect qualitative and quantitative information about the company and the markets it serves. Questions included among others: relevant revenue, number of employees, primary market, number of healthcare entities currently using its solution, and more in-depth questions regarding features and functions.
- When possible, upon receiving the completed questionnaire we conducted a follow-up interview with each vendor. These in-depth telephone interviews typically lasted 60 minutes and built on the responses to the questionnaire. This portion of the research effort also focused on topics that cannot easily be captured within the context of a written questionnaire including competitive positioning, product roadmap, partnership strategy, and which solution features are most attractive to prospective customers.

- Chilmark Research performed a final analysis of the vendors via secondary research and telephone interviews with end users and consultants that have advised on, deployed, or used a vendor's system. This information was compiled to provide the in-depth reviews and ratings of the profiled vendors. Prior to publication comments and feedback were considered and where relevant, incorporated into the final profile narratives.
- In developing this extensive report, Chilmark Research maintained absolute objectivity throughout the entire research process and it is our sincere hope that this report brings greater clarity to this evolving market.







ABOUT THE ANALYST TEAM



John Moore II launched Chilmark Research in 2007. From those humble beginnings, John has built Chilmark Research into a respected analyst firm that provides market-leading coverage of the most transformative sectors of healthcare IT. Of great personal interest to John is the role that the consumer will ultimately play in the rapidly evolving healthcare market.

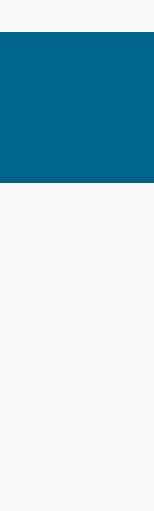
Alex Lennox-Miller joined the Chilmark Research team in 2018 as a Senior Analyst specializing in provider-payer-patient convergence. His work focuses on value propositions for HCOs and payers, particularly in the implementation and potential use cases of analytic and workflow packages for clinical, administrative, and financial areas.





Elena lakovleva joined the Chilmark Research team in 2022 as a Research Analyst specializing in revenue cycle management and remote patient monitoring initiatives. Her major focus lays in healthcare accessibility and new technologies adoption among payers, providers and patients.









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