Whitepaper | February 2026

Innovating patient journeys with AI solutions to reduce potentially avoidable hospitalizations

This white paper is based on opinions and reflections from a roundtable discussion organized and sponsored by Nebius.

Executive summary

This white paper is based on a BioTechX 2025 roundtable, where healthcare innovators and technology leaders explored opportunities to reduce avoidable admissions and improve patient journeys.

The discussion focused on major challenges posed by Potentially Avoidable Hospitalizations (PAHs) to healthcare systems worldwide. PAHs refer to hospital admissions that could be prevented through effective outpatient care. Their prevalence signals gaps in primary care access, quality, and long-term management.

Participants noted that many such admissions could be reduced through more integrated healthcare services, increasingly supported by AI solutions that strengthen system resilience.

This paper outlines key challenges and opportunities for reducing PAHs globally and advancing patient-centric, AI-enabled care.



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Introduction

The Organisation for Economic Co-operation and Development (OECD) tracks Potentially Avoidable Hospitalizations (PAHs) as a key quality-of-care indicator. The OECD's Health at a Glance Report[1] defines PAHs as hospital admissions for chronic conditions that can be controlled with well-established treatments in primary care.

Caused by complications of congestive heart failure, chronic obstructive pulmonary disease, asthma, and diabetes, PAHs can often be prevented with lifestyle changes, regular medication, and routine monitoring. A higher rate of PAHs may reflect limited access to timely, high-quality primary care, the OECD suggests.

PAHs have been declining in 28 of 30 OECD countries over the past decade, according to the 2025 edition of the report. However, roundtable participants noted that they remain a significant burden, especially in systems facing aging populations and workforce shortages. The group emphasized that PAHs not only impose emotional stress and financial hardships on patients but also increase pressure on Emergency Departments and lead to inefficient resource use, driving healthcare costs.

This white paper is based on insights from a roundtable hosted by AstraZeneca, NVIDIA, and Nebius at BioTechX Europe in October 2025. Moderated by a pharmaceutical industry specialist, the session brought together healthcare and technology leaders from diagnostics, clinical decision support, AI cloud infrastructure, to discuss how AI can expand access to evidence-based therapies and reduce PAHs, improving patient outcomes and strengthening healthcare systems.

Transforming care with AI and collaboration

Roundtable participants discussed how AI is changing care delivery and reducing PAHs as more multi-modal data becomes available. This includes patient histories, medical imaging, diagnostics, and data from wearable remote monitoring devices.

High-performance computing clusters optimized for AI-native workflows enhance emerging generative and agentic solutions. These systems learn from both structured and unstructured data, expanding hospitals' ability to deliver guideline-directed medical therapy (GDMT) across the patient journey, participants said.

New AI solutions increasingly support healthcare systems by helping them deliver more personalized outpatient care and follow-up, participants noted. Novel tools extend the reach of primary care for earlier diagnosis and more efficient referrals and help clinicians and nurses deliver evidence-based care effectively.

In line with the World Bank's **Digital-in-Health**[2] report, participants emphasized that cross-sector collaboration is critical to overcoming systemic barriers. They highlighted the need for coordinated action by policymakers, healthcare providers, technology companies, and patients across local and global ecosystems.

They also pointed to the role of modern governance frameworks in fostering innovation, alongside value-based economic models that shift care from siloed specialties to patient journeys.

The discussion further highlighted the importance of human-centric adoption strategies and public-private partnerships. These approaches can strengthen system resilience and help patients receive timely, high-quality care for chronic conditions, improving overall quality of life.

(1) OECD (2025), Health at a Glance 2025: OECD Indicators, OECD Publishing, Paris

(2) World Bank (2023), Digital-in-Health: Unlocking the Value for Everyone, World Bank, Washington

AI-Enhanced healthcare: Preventing PAHs

Participants highlighted how AI can expand evidence-based care across patient journeys by amplifying primary care, prioritizing risks, and personalizing follow-up. Smarter data integration and predictive modeling help clinicians and nurses to deliver guideline-directed care at scale.

1. Extending specialist capabilities to primary care

Accurate referrals help patients access specialized care and use resources efficiently, but triage precision is still a challenge, participants noted. Electrocardiograms were cited as an example. They are essential for diagnosing cardiovascular conditions, yet the median physician interpretation accuracy reached only 54%, JAMA Internal Medicine reported[3]. This can lead to misclassification and unnecessary strain.

The group highlighted AI-enabled diagnostics in primary care for their potential to speed up critical tests like electrocardiograms and, as a participant noted, scale cardiologist-level classification accuracy (up to 95%, according to a pilot study published in the Cardiovascular Digital Health Journal[4]) across frontline settings. These innovations could cut avoidable ER visits, false positives, and unnecessary referrals for chronic conditions.

The roundtable also explored AI-guided pilot approaches that let non-clinical staff conduct routine exams, such as experimental pathways for automatically analyzed echocardiograms. Even when performed by staff without any clinical experience, this experimental approach, subject to local regulatory allowances and supervision, can reduce bottlenecks and expand primary care capacity, while maintaining diagnostic quality.

Other innovative approaches mentioned in the discussion include:

> **Enhanced patient journeys:** AI solutions in primary care can assist physicians by analyzing large volumes of data and identifying high-risk patients, improving referral pathways, and reducing hospital workload. AI-powered summaries also help practitioners flag gaps in patient journeys, preventing redundant steps.
>
> **Early detection focus:** AI-powered tools can help identify clinically relevant conditions early, so patients can start treatment sooner and make timely lifestyle adjustments for better chronic disease management.



(3) Cook, D. A., Oh, S. Y., & Pusic, M. V. (2020). Accuracy of Physicians' Electrocardiogram Interpretations: A Systematic Review and Meta-analysis. JAMA Internal Medicine, 180(11), 1461-1471.

(4) Quartieri, F., Marina-Breysse, M., Pollastrelli, A., Paini, I., Lizcano, C., Lillo-Castellano, J. M, Grammatico, A.(2022). Artificial intelligence augments detection accuracy of cardiac insertable cardiac monitors: Results from a pilot prospective observational study. Cardiovascular Digital Health Journal, 3(5), 201-211.

2. Advancing personalized care

The group noted that risk stratification is a key area where AI can be used to prevent PAHs. AI solutions can identify high-risk patients who may benefit from more frequent follow-ups, helping healthcare systems move beyond one-size-fits-all protocols to personalized care, participants said.

They mentioned hospital implementations of discharge letters powered by Large Language Models (LLMs) under version control that reduced writing time from 45 to 10 minutes, according to a participant. By generating drafts from electronic medical records, caregivers can spend more time tailoring follow-up schedules to each patient's clinical needs.

Participants also emphasized generative AI's potential to enhance:

> **Continuous monitoring:** Algorithms integrate and analyze large patient datasets to detect risks early, guide follow-up frequency, and improve patient journeys.
>
> **Treatment adherence:** AI helps clinicians and nurses to communicate benefits and risks clearly, reducing PAHs.

3. Scaling guideline-directed medical therapy (GDMT)

Participants discussed strategies to support clinicians in delivering evidence-based care across chronic disease management and preventing PAHs.

Medical guidelines are often long and complex, making it hard for practitioners to stay current across specialties. Generative AI tools can surface the latest medical evidence and provide actionable treatment guidance to support decision-making. Participants also noted additional benefits from generative AI's potential to scale guided directed medical therapy (GDMT):

> **Stronger audit traceability and patient trust:** Structured LLM outputs help ensure consistent documentation and demonstrate guideline adherence, supporting reimbursement requirements.
>
> **Easing administrative burdens:** Clinicians often have limited time with patients, leaving little room to verify diagnostic gaps. AI synthesizes patient records and exam data, reducing missed interventions, diagnostic delays, and enhancing GDMT compliance



Overcoming barriers to AI-assisted care

AI solutions, from clinically informed LLMs to dynamically orchestrated agents, offer enormous potential to enhance healthcare delivery with clinician-reviewed outputs informed by traceable medical sources under version control. Yet, their large-scale adoption remains a challenge.

Participants identified key barriers for implementation mainly around data access, workflow integration, and system-wide incentives. This section summarizes their insights.

1. Data availability for AI-enabled innovation

Building equitable data-sharing models:

Participants noted that healthcare data now comes from many sources that include genomics, wearables, sensors, lab results, and clinical notes. AI can leverage this to deliver faster insights, but trusted data-sharing models are essential to translate this potential into practice.

Current data broker systems often disconnect hospitals from data usage, creating mistrust, participants said. Their opinions on potential data monetization approaches differed. Alternatives like licensing, freemium access, or co-development partnerships with healthcare institutions were discussed.

Giving up a potential revenue stream might be short-sighted, since extra funds could help cover staffing gaps or medical equipment, some participants said. Others argued that AI solutions could save millions in hospitalization costs by improving efficiency and supporting long-term competitiveness.

Regulatory clarity to enable innovation:

Unclear rules around data sharing, especially across borders, can slow AI adoption, the group concluded. Privacy-preserving methods that allow collaboration while maintaining commitments to data sovereignty, patient safety, bias monitoring, and clinician oversight would boost solution development, participants noted. They also stressed the need for streamlined, risk-based regulatory pathways that support responsible innovation.

“If we want a very strong offering from AI tools, we need a playground, a pathway where compliance fits with rapid development”, one participant said.

New solutions require regulatory approval, and the reviewing cycles often take over a year, participants noted.

“The understanding we need from regulatory bodies is that this is happening fast and we’re all working for the same purpose here: to be more efficient in the future”, another participant added.

Integration and interoperability

The group also noted that well-documented patient journeys and cross-system integration are essential to support AI diagnostics, improve patient monitoring, and personalized care.

Investing in robust, standards-based infrastructure will help healthcare systems move beyond scanned documents towards AI-ready environments and data, participants said. By developing advanced data pipelines, combined with microservice architecture, tech companies can contribute to modular solutions that fit into existing systems.

2. Workflow integration

Augmenting care delivery

The roundtable also focused on integrating AI into fast-paced clinical environments. Participants noted that healthcare systems face workforce shortages, capacity limits, and information overloads, leaving clinicians with little time to manage increasing data entry, manual tasks, or complex integrations. While the potential value of AI is clear, participants stressed that new tools must fit existing clinical windows and IT systems.

Participants discussed how AI solutions could further reshape clinical workflows. Experimental task-shifting approaches may offload parts of general practitioner (GP) workloads to non-clinical staff under supervision when allowed by local regulation. One example is a pilot initiative using AI-guided echocardiograms that automatically capture measurements and support faster triage. Acting as clinical companions under clinician oversight, AI agents can also summarize patient data and guidance from traceable medical standards, reducing clinicians' workload while maintaining version control.

Cross-functional transformation teams

AI adoption strategies were also addressed at the roundtable. Participants emphasized that systemic implementation goes beyond training clinicians to use new tools. Based on past deployments, they stressed the importance of early involvement of multidisciplinary teams. These should include clinicians, nurses, AI experts, ethics, and compliance professionals. A cross-functional approach helps align AI initiatives with institutional goals, reduce risk, and preserve trust.

3. Rewarding patient outcomes: Towards prevention-first models

From siloed specialties to a system perspective

Participants observed that pilot programs in radiology and medical imaging improved patient outcomes, but the largest clinical, operational, and cost benefits were seen in other specialties further along the care pathway. These downstream effects are not always realized, slowing large-scale adoption. Holistic economic models are needed to reward improved outcomes across patient journeys and specialties, the group said.

Increasing patient education and agency

Strengthening treatment adherence was another topic of the roundtable. Patients who understand their condition are more likely to follow treatment plans, which is critical for reducing PAHs, participants said. They noted that AI can support this by explaining treatment implications in an accessible language. Combined with public health campaigns, AI tools can help identify untreated patients and encourage timely care-seeking.

Participants also pointed to emerging models such as "hospitals without walls," which expand access to diagnostics through pharmacies and community screening programs. Supported by strong data infrastructure and clear follow-up guidance, these initiatives bring diagnostics closer to patients and help broaden access to care.

Shifting to collaborative patient-centric projects

During the roundtable, healthcare innovators, pharmaceutical and tech leaders shared a vision for collaborative action — a key factor in overcoming structural barriers and unlocking AI's potential to improve disease management and reduce PAHs. Participants noted that no single stakeholder can drive large-scale implementation alone and highlighted how multiple actors can contribute to AI-enhanced care transformation.

The following opportunities were identified across sectors:

Solution providers

Lower adoption threshold	Deliver intuitive, workflow-friendly solutions without additional complexity. Make tools easier for staff to use while enhancing transparency and human-centric adoption.
Evidence-based by design	Ensure tools support informed decision-making and promote GDMT with explainable recommendations and traceable sources under version control and clinician supervision. Based on Health Economics and Outcomes Research (HEOR) methods, a more robust trial design helps reduce PAHs and improve patient outcomes.
System-level applicability	Design solutions that go beyond single-indication tools and integrate with core clinical needs and operational systems such as EHR, scheduling and order management. Interoperable architectures enable upstream and downstream integration, embedding solutions into workflows for easier adoption and measurable impact.
Democratize access to diagnostics and AI	Lower barriers to automated exam interpretation to expand non-clinical staff capacity and amplify AI-supported care. Generative AI can also help staff explain medical recommendations and risks in clear language, improving patient outcomes.



Tech companies

Scale solutions into real-world care	Tech partners can provide vertically integrated, purpose-built infrastructure designed to support complex AI workflows, participants said. This ensures high performance and low-latency inference in fast-paced clinical environments. Tailored Machine Learning Operations (MLOps) support can further accelerate integration.
Enhance model synergies and multimodal data pipelines	AI-enabled care relies on complex data pipelines, including exam results, vitals, medical history, and clinical trial outcomes. Tech partners can offer optimized storage, distributed training, and fast inference across hybrid environments, enabling multiple models to work together reliably, the group said.
Secure, compliant data flows	Compliance with health-specific regulations such as the General Data Protection Regulation (GDPR), the Health Insurance Portability and Accountability Act (HIPAA), and Service and Organization Controls (SOC) 2 Type II, as well as international security standards, is essential for trusted AI adoption. Healthcare organizations can rely on tech partners for secure, enterprise-grade infrastructure to process sensitive data confidently, participants said.

Pharmaceutical leaders

Facilitate forward-leaning partnerships	Testing new solutions in clinical settings is essential to create tools that truly meet patient needs. Pharmaceutical companies can play a central role by linking solution providers with healthcare institutions, supporting pilot studies, partnerships, and awareness initiatives to drive adoption, participants said.
Co-create evidence and demonstrate impact	Pharmaceutical leaders play a key role in shaping HEOR initiatives to measure effects on outcomes such as PAHs, time-to-diagnosis, and guideline adherence. By leveraging their networks, they can support partnerships and fund clinical fellows to carry out experimental projects in real-world settings, the group concluded.



Hospitals and healthcare systems

Open experimental pathways	Hospitals can provide innovation sandboxes, venture arms, and data assets to test AI solutions and track impacts on patient outcomes, the group argued.
System-level strategies	AI can help expand primary care capacity, guide high-risk patients to specialists, and reduce pressure on secondary care. Participants emphasized that healthcare systems can explore outcome-focused models and strategic budget shifts to prevent costly PAHs.
Advance technological maturity	Digital medical data in machine-readable formats and well-documented journeys boost real-time analytics and agentic AI, experts said. They also discussed how stronger infrastructure and interoperability support faster diagnostics and timely interventions.

Policymakers and regulators

Modernize governance	Faster, iterative development cycles and risk-based regulatory pathways can help health-tech move from beta versions to mature offerings. Streamlined regulatory pathways also boost competitiveness while sustaining commitments to patient safety, privacy, bias monitoring, and clinician oversight, the group noted.
Enable secure data sharing	Scaling diagnostics and AI-driven care requires access to large medical datasets. Clear data governance and secure sharing guidelines are essential to preserve patient safety and privacy during collaborative model development while ensuring bias monitoring and clinician supervision, participants said.
Foster public-private synergies	Strong national leadership, as noted in the World Bank's Digital-in-Health report[5], drives large-scale adoption of AI solutions in healthcare. Regulatory and legislative clarity helps public and private sectors collaborate effectively and provide incentives, such as compensating hospitals for services during studies, the group agreed.



(5) World Bank (2023), Digital-in-Health: Unlocking the Value for Everyone, World Bank, Washington

Looking ahead: Patient-centric, AI-enabled care

The roundtable highlighted AI's potential to augment clinicians' and nurses' ability to deliver GDMT across healthcare systems. This will support early diagnostics, expand access to high-quality primary care, and facilitate more efficient referrals.

When aligned with existing workflows and focused on patient outcomes, AI solutions can increase system capacity to treat chronic conditions, prevent complications, and reduce PAHs, the group concluded. These tools can help healthcare meet growing demands more effectively by supporting risk-based triage and personalized medicine.

Participants emphasized that scaling validated solutions requires coordinated action across the ecosystem, with tech providers, pharmaceutical companies, hospitals, and policymakers all playing key roles in shaping patient-centric, AI-enabled care.

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Veeva ID: Z4-81255 | February 2026