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Beyond Borders, Into Saudi Arabia:

Leveraging Emerging Technologies to Build the Healthcare System of the Future.

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Leveraging Emerging Technologies to Build the Healthcare System of the Future.

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Saudi Arabia's Vision 2030 is widely recognised as one of the most ambitious national transformation programmes in the modern era. It is not simply an economic reform plan but a comprehensive blueprint to diversify the economy, elevate social wellbeing, and strengthen the Kingdom's position as a global leader. At its heart lies a bold commitment to innovation. Infrastructure, capital, and human resources are all vital, but it is the early adoption and localisation of breakthrough technologies that will ultimately define the pace and depth of Saudi Arabia's transformation.

World Economic Forum's (WEF) Top 10 Emerging Technologies of 2025 provides a valuable window into the innovations most likely to reshape societies and markets in the decade ahead.[1] These technologies are not abstract trends confined to laboratories; they are actionable opportunities that, when deployed strategically, can accelerate the Kingdom's pursuit of Vision 2030. For Saudi Arabia, the healthcare sector represents one of the clearest areas where emerging technologies can be harnessed to deliver both societal impact and economic diversification.

Healthcare is not just a service; it is an industry that drives investment, creates intellectual property, stimulates high-value jobs, and supports resilience. With a fast-growing population, increasing life expectancy, and a rising prevalence of chronic and age-related diseases[2], Saudi Arabia faces a dual challenge: to meet the needs of its citizens today while building a system that anticipates the demands of tomorrow. Emerging technologies in biotechnology, pharmaceuticals, and digital health are central to this challenge.

At Aldar Audit Bureau, Grant Thornton, we believe the Kingdom is uniquely positioned to act not merely as a consumer of these innovations but as a global testbed and exporter of healthcare technologies. With giga-projects, sovereign wealth funds, and national strategies already in motion, Saudi Arabia has the ingredients to leapfrog traditional healthcare models and establish itself as a leader in biotech, preventive care, and medical innovation.

Chapter 1:

Healthcare Transformation: Building on Strong Foundations.

Saudi Arabia has already taken decisive steps to position healthcare as a central pillar of Vision 2030. The launch of the National Biotechnology Strategy in 2021 set an ambitious target: by 2030, 50% of the Kingdom's pharmaceutical and biotech spending will be localised.[3] This localisation is not simply about reducing import dependency; it is about developing a domestic innovation ecosystem that can create intellectual property, attract global partnerships, and establish the Kingdom as a regional hub for life sciences.

Complementing this ambition is the rise of digital-first healthcare delivery. The launch of the SEHA Virtual Hospital, the largest in the world, demonstrates the Kingdom's intent to reimagine healthcare access through digital platforms.[4] SEHA connects patients across the Kingdom with world-class specialists, using AI and telemedicine to break down geographic barriers. This infrastructure provides a ready platform for integrating emerging technologies such as autonomous biochemical sensing.

Finally, the government has expressed a clear intent to make Riyadh and Jeddah regional centres for clinical trials, offering incentives for international pharmaceutical companies to conduct research and development locally.[5] This ambition, if paired with the right regulatory and commercial frameworks, could transform the Kingdom into a magnet for healthcare investment across the GCC and Africa.

These foundations set the stage for integrating three of the WEF's most crucial healthcare innovations: engineered living therapeutics (ELT's), GLP-1 drugs for neurodegenerative disease, and autonomous biochemical sensing. Each offers Saudi Arabia a pathway to accelerate its healthcare transformation while creating new industries and export opportunities.

Our Perspective:

From our vantage point at Grant Thornton, these steps create a unique convergence moment: a bold biotechnology strategy, digital-first delivery infrastructure, and clinical research ambitions all aligned under the Vision 2030 umbrella. But foundations alone are not enough. Execution requires three things:

1

Sovereign Wealth Fund Catalyst:

Funds like PIF must act as both investors and conveners, attracting global biotech and medtech players through joint ventures, minority stakes, and co-investment platforms.

2

Regulatory Innovation:

The Saudi Food and Drug Authority (FDA) and Ministry of Health have the opportunity to establish globally benchmarked regulatory frameworks that not only enable safe adoption of new technologies but also make the Kingdom the preferred jurisdiction for trialling them.

3

Knowledge Ecosystem Development:

Universities, hospitals, and research centres must be networked into a single national health innovation platform, ensuring local talent is trained and retained while global experts are embedded through secondments and partnerships.

If these levers are pulled, Saudi Arabia will not simply integrate emerging technologies like ELTs, GLP-1 drugs, and autonomous sensing, it will set the global standard for their deployment. In doing so, the Kingdom can shift the narrative from being a healthcare importer to a global healthcare leader, shaping the innovation agendas of others while realising the full potential of Vision 2030.

Imad Adileh, Chief Growth Officer
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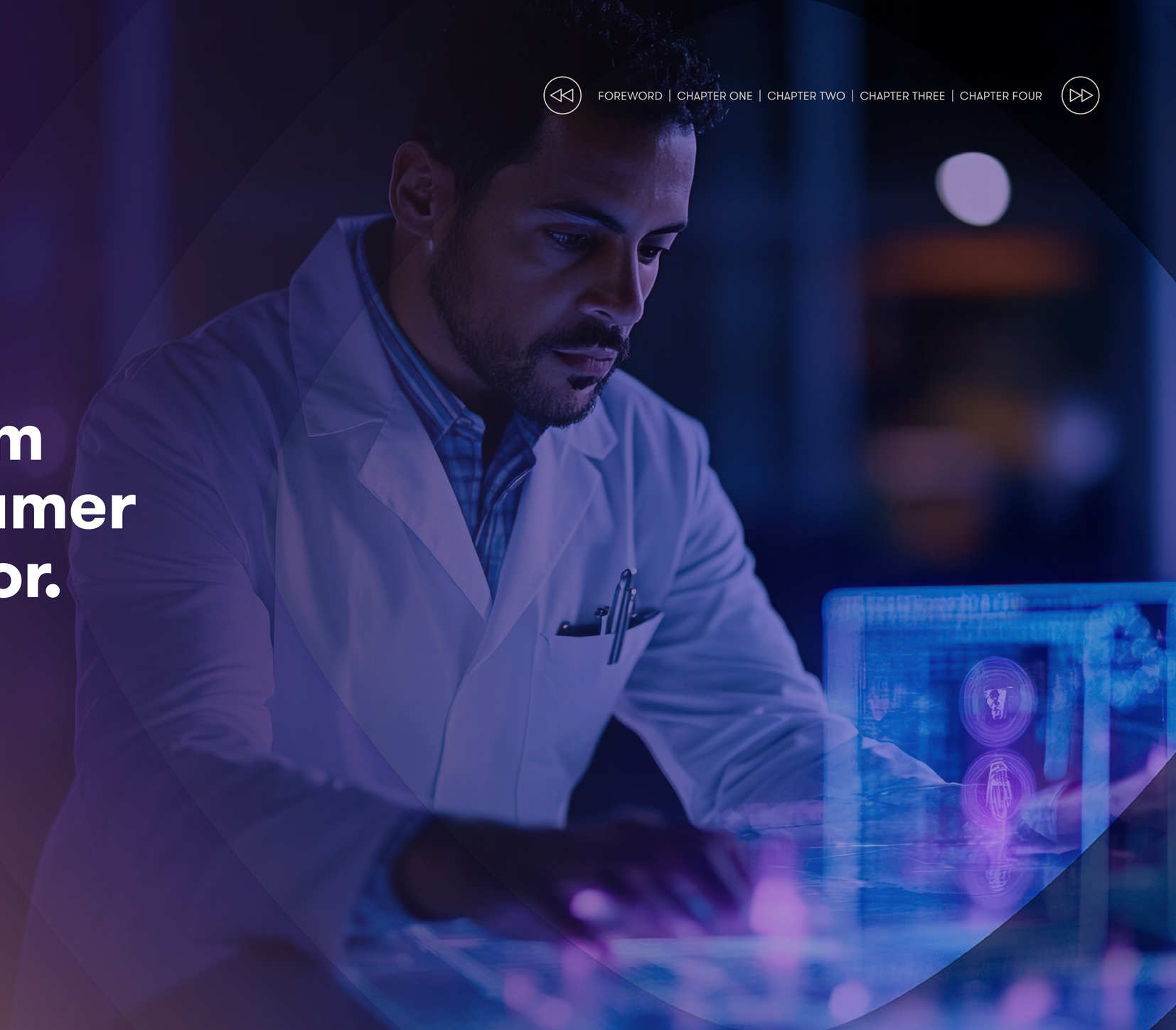
Chapter 2:

Engineered Living Therapeutics: From Healthcare Consumer to Global Innovator.



The WEF identifies ELTs as one of the most disruptive healthcare breakthroughs on the horizon. These genetically modified microbes are designed to produce treatments inside the human body. Rather than manufacturing drugs externally and distributing them through global supply chains, ELTs effectively transform the patient into the site of production. According to the WEF, this approach could reduce manufacturing costs by up to 70% while enabling therapies that are more precise, adaptive, and scalable.[1]

Why It Matters for Saudi Arabia

Saudi Arabia currently imports the vast majority of its advanced pharmaceuticals, leaving it exposed to supply chain shocks, pricing pressures, and geopolitical disruptions.[6] This dependency runs counter to the Kingdom's ambition under Vision 2030 to build a resilient, self-sufficient, and globally competitive healthcare system.

By localising ELT research and production, Saudi Arabia could:

- Reduce strategic vulnerability by cutting reliance on external supply chains.
- Build new industrial capacity in biotech manufacturing and R&D.
- Position itself as a regional exporter, supplying GCC and African markets with next-generation therapies.

The Kingdom's giga-projects, such as NEOM and King Abdullah Economic City, already integrate healthcare and innovation districts. These environments are uniquely suited to serve as "living laboratories" where regulators, clinicians, and biotech firms collaborate to trial, scale, and commercialise ELTs under real-world conditions.

This is not just about healthcare delivery. It is about shifting Saudi Arabia from being a consumer at the end of the global value chain to an originator shaping the frontiers of biotechnology, in direct alignment with Vision 2030's diversification and resilience agenda.

Building Saudi Arabia's ELT Advantage

Saudi Arabia has the platform to build a differentiated ELT ecosystem. By leveraging sovereign wealth funds, giga-projects, and its fast-evolving regulatory landscape, the Kingdom could:

- Anchor biotech clusters that attract global players into joint ventures and research partnerships.
- Establish clinical trial hubs integrated into health districts at NEOM or Riyadh, embedding Saudi Arabia within the global innovation cycle.
- Export intellectual property, treatments, and governance frameworks, positioning itself as both a market and a standard-setter.

If executed well, ELTs could become not just a therapeutic breakthrough for Saudi patients but also a new industrial pillar of the economy, creating high-value jobs and establishing the Kingdom as a global biotech leader.

Risks and Requirements

Like all frontier innovations, ELTs carry both opportunity and risk.

- Scientific and Regulatory Readiness: ELTs are still in early stages. Their safety, scalability, and efficacy require extensive testing. Saudi Arabia will need internationally recognised regulatory frameworks, ethical oversight, and transparent approval processes to attract credible trials and gain global legitimacy.
- Integration into Industrial Policy: ELTs are not just medicines; they represent a new bio-industrial paradigm. This means aligning national healthcare planning with industrial policy, workforce development, and fiscal frameworks that can support local manufacturing and scale.
- Global Competition: The U.S., Singapore, and South Korea already lead in biotech. Without a deliberate strategy, Saudi Arabia risks being a late adopter. Success will depend on speed, collaboration, and the ability to carve out a distinctive role in the global innovation cycle.

Grant Thornton Perspective: Enabling the ELT Ecosystem

ELTs are more than a medical breakthrough; they are a strategic lever of economic transformation. Their success in Saudi Arabia depends on aligning innovation with trust, fiscal sustainability, and ecosystem design.

We see five critical areas where the Kingdom can unlock disproportionate value:

1. Embedding Trust in Biotech Governance

   ELTs raise complex regulatory and ethical issues. Transparent audit frameworks and independent assurance of trial protocols will be essential for Saudi research to be recognised by regulators such as the FDA or EMA.

2. Designing Smart Incentives for R&D and Manufacturing

   To attract frontier biotech firms, Saudi Arabia must create targeted R&D tax incentives, accelerated depreciation for biotech facilities, and frameworks for IP localisation.

3. Creating Innovation-Ready Ecosystems

   ELTs require environments where science, data, and healthcare delivery intersect. GT's advisory teams can work with giga-projects to design integrated biotech districts, places where clinical trials, AI analytics, and healthcare providers collaborate in real-time, creating visibility and credibility for global partners.

4. Data as a Strategic Export

   ELTs will generate unique datasets on patient biology, which is underrepresented in global research. Properly anonymised and governed, this data could become a strategic export, attracting life sciences and AI partners.

5. Resilience and Scenario Planning

   ELTs will face setbacks, from trial failures to global pricing disputes. GT's risk advisory expertise can support Saudi institutions in stress-testing strategies, modelling fiscal impacts, and ensuring that investments in biotech remain adaptive and resilient.

An Innovative Role for Saudi Arabia

ELTs give Saudi Arabia a rare chance to redefine its position in global healthcare. No longer a consumer, the Kingdom could emerge as a producer, regulator, and exporter of next-generation biotech.

By embedding itself in the global ELT value chain, from research to regulation, from data to commercialisation, Saudi Arabia can:

- Improve domestic health resilience.
- Reduce strategic dependency on imports.
- Attract global research capital and partnerships.
- Export intellectual property, expertise, and governance models.

In this light, ELTs are not just a therapeutic innovation. They are a catalyst for Saudi Arabia's transformation into a global healthcare innovator, aligned with Vision 2030's ambition to diversify the economy, extend healthy life expectancy, and lead in the industries of the future.

While ELTs highlight how Saudi Arabia can anchor an industrial biotech future, GLP-1 therapies demonstrate how repurposed science can address demographic and social resilience challenges.

Chapter 3:

GLP-1s for Neurodegenerative Disease: A Frontier for Ageing Societies.

The WEF highlights the repurposing of GLP-1 drugs as one of the most transformative healthcare frontiers of the coming decade. Originally designed to treat diabetes and weight management, these therapies are now being trialled for Alzheimer's and Parkinson's, two of the most pressing healthcare challenges of the 21st century.[1] Their potential lies not only in alleviating symptoms but in altering the trajectory of neurodegenerative diseases altogether.

Why It Matters for Saudi Arabia

Saudi Arabia is not immune to the global rise of dementia and related conditions. As infectious disease mortality falls and life expectancy rises, age-related illnesses are becoming a defining healthcare burden. Dementia prevalence alone is projected to increase sharply, exerting pressure not only on healthcare budgets but also on families and caregivers who provide long-term support.[7]

The economics are stark: decades of institutional care can consume vast fiscal resources, while undermining labour market participation and social cohesion. GLP-1 therapies, if proven effective, could disrupt this trajectory, delaying disease onset, reducing the intensity of long-term care, and preserving quality of life for patients. The social return is equally powerful: an older population that remains healthier, more engaged, and more productive aligns squarely with Vision 2030's goals of resilience, inclusion, and extended healthy life expectancy.

Building Saudi Arabia's Neuro-Health Advantage

Saudi Arabia has already positioned itself as a regional hub for specialised medicine and medical tourism. This ambition, combined with the government's stated intent to expand local clinical trial activity, creates a strong platform for establishing a Centre of Excellence in Neuro-Health in Riyadh. Such a centre could:

- Anchor clinical trials for GLP-1 therapies and other neuro-health innovations.
- Attract global pharmaceutical partners seeking trusted trial environments in the GCC.
- Serve as a magnet for international researchers, clinicians, and medical tourists.
- Create domestic capacity in neurology, pharmaceuticals, and precision medicine.

The potential extends beyond healthcare delivery. If Saudi Arabia becomes an early site for GLP-1 trials, it embeds itself within the global innovation cycle, securing intellectual property partnerships, technology transfer, and the commercial spillovers of being a trusted R&D hub.

Risks and Requirements

As with any frontier therapy, success depends on the strength of the enabling environment:

- Clinical and Regulatory Readiness

  Global pharmaceutical firms will only bring cutting-edge trials to Saudi Arabia if frameworks are internationally recognised, efficient, and reliable. Streamlined approvals, ethical oversight, and alignment with global protocols are critical to attract and retain investment.

- Integration into National Health Strategy

  Clinical breakthroughs alone are insufficient without systems to absorb them. Saudi Arabia will need to develop treatment pathways, specialist training, and reimbursement models that allow GLP-1 therapies to be deployed widely once proven.

- Fiscal and Economic Planning

  These therapies may command premium costs in early stages. Governments and investors must balance near-term spending against the long-term savings they deliver in reduced institutional care and higher productivity.

Our Perspective

GLP-1 therapies represent more than a pharmaceutical breakthrough. They are a test case for how Saudi Arabia can reimagine its healthcare system, its innovation economy, and its role on the global stage. We see four key areas where the Kingdom can unlock disproportionate value:

1. Embedding Trust in Clinical Research

   For multinational pharmaceutical companies, data integrity is non-negotiable. Our assurance expertise can help design transparent audit frameworks for clinical trials conducted in Saudi Arabia. Independent validation of trial protocols, outcomes, and safety data builds credibility with global regulators such as the FDA and EMA, giving Saudi-based research global legitimacy.

2. Designing Smart Incentives and Fiscal Pathways

   Neuro-health breakthroughs will attract premium pricing in their early phases. Through tax and regulatory advisory, we can help shape incentive regimes that balance affordability for the government with attractiveness for foreign investors. This might include targeted tax reliefs for R&D, accelerated depreciation on clinical infrastructure, or reimbursement frameworks that encourage adoption without destabilising budgets.

3. Creating Innovation-Ready Ecosystems

   Successful deployment of GLP-1 therapies will require more than hospitals; it needs ecosystems where biotech, data science, and healthcare delivery converge. Through advisory services, GT can help giga-projects like NEOM or Riyadh Health Cluster design integrated neuro-health districts where clinical trials, AI-driven diagnostics, and digital health records co-exist in real-time. This positions Saudi Arabia not just as a research site, but as a global model for next-generation neuro-healthcare environments.

4. Data as a Strategic Asset

   GLP-1 therapies and related neuro-health trials will generate unprecedented datasets on ageing populations in the Middle East, data that is globally under-represented. Properly governed, anonymised, and monetised, this data could become a strategic export in its own right, attracting partnerships with AI firms, life sciences companies, and global research institutions. GT's advisory role lies in helping regulators and healthcare providers set up governance structures that ensure data security, privacy compliance, and value creation, positioning Saudi Arabia as a hub for ethical health data innovation.

5. Resilience and Scenario Planning

   No innovation comes without risks. Clinical setbacks, pricing disputes, or adoption barriers could stall progress. By leveraging our expertise in scenario planning and risk advisory, we can help the Kingdom stress-test healthcare strategies modelling fiscal impacts, adoption curves, and global competitive dynamics. This ensures that Saudi Arabia's neuro-health investments remain adaptive, resilient, and strategically aligned with Vision 2030.

An Innovative Role for Saudi Arabia

Taken together, these opportunities suggest a role for Saudi Arabia that goes well beyond adoption: the Kingdom can become a standard-setter in neuro-health governance, a hub for global partnerships, and a trusted source of both therapies and the frameworks that support them.

From Grant Thornton's perspective, the real opportunity is to embed Saudi Arabia within the global neuro-health value chain: from clinical trials to commercialisation, from data governance to fiscal frameworks. By doing so, the Kingdom not only alleviates a looming demographic challenge but positions itself as an exporter of expertise, intellectual property, and regulatory leadership.

In this light, GLP-1 therapies are not just a cure for disease they are a catalyst for Saudi Arabia to evolve into a global innovation economy in healthcare, aligned with Vision 2030's ambition to diversify beyond oil, extend healthy life expectancy, and lead in the industries of the future.

If GLP-1 therapies help mitigate the long-term burden of ageing, autonomous biochemical sensing represents the other side of the equation: empowering younger and working populations through predictive, preventive care.

Chapter 4:

Autonomous Biochemical Sensing: The Shift to Predictive Healthcare.

The WEF identifies autonomous biochemical sensing as one of the most far-reaching innovations in global healthcare. These wearable or implantable devices continuously monitor biomarkers, enabling care that is proactive rather than reactive. Instead of relying on episodic hospital visits, patients can benefit from continuous, personalised monitoring that predicts health risks before they escalate.[1]

Why It Matters for Saudi Arabia

For the Kingdom, the implications are transformative. Healthcare demand is rising alongside rapid urbanisation, population growth, and demographic change. Traditional models of care, reliant on physical infrastructure and reactive treatment, will struggle to keep pace.

Autonomous sensing offers a paradigm shift. Consider the annual Hajj and Umrah pilgrimages, where millions of people converge in close proximity. Real-time monitoring could detect outbreaks of infectious disease before they spread, safeguarding lives and reinforcing Saudi Arabia's role as custodian of these global gatherings.

Equally, women's health, a growing national priority under Vision 2030, could be transformed. Continuous monitoring for fertility, menopause, and chronic conditions empowers women with greater autonomy over their health, while strengthening inclusion and social resilience.

If pursued strategically, autonomous biochemical sensing could shift Saudi Arabia's healthcare model from treatment to prevention, aligning squarely with Vision 2030's emphasis on resilience, inclusion, and system-wide efficiency.

Risks and Requirements

Data Governance and Public Trust

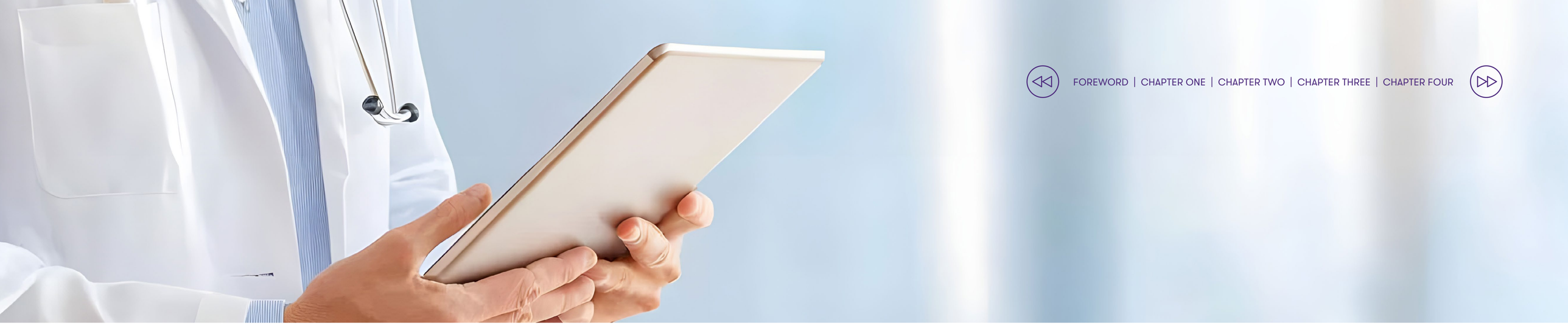
Continuous health monitoring generates vast volumes of sensitive personal data. Without strong privacy, security, and ethical frameworks, adoption will stall. Saudi Arabia must build globally respected governance regimes to ensure patient trust and international recognition.

Clinical Integration

Technology alone is insufficient. Healthcare providers need new treatment pathways, training, and reimbursement models to integrate predictive care into mainstream delivery.

System Costs and Equity

While sensors may reduce long-term costs, upfront investment is significant. Governments and insurers must balance affordability with broad accessibility, ensuring innovation does not deepen health inequities.



Enabling Predictive Healthcare

Autonomous biochemical sensing is not just a medical technology; it is a strategic lever for national well-being management. Its success in Saudi Arabia depends on building trust, embedding governance, and creating innovation-ready ecosystems.

We see five critical enablers:

1. Independent Assurance of Data and Devices

   For adoption at scale, both patients and international partners must trust the validity of the data. GT's assurance expertise can support regulators and providers in designing audit frameworks that certify device safety, trial outcomes, and data integrity, creating credibility across global healthcare markets.

2. Regulatory and Fiscal Design

   The economics of preventive care require carefully balanced incentives. GT's tax and regulatory advisory teams can help shape frameworks for device adoption, from R&D credits for manufacturers to reimbursement models for insurers, ensuring fiscal sustainability while encouraging innovation.

3. Integration with Giga-Projects and Health Platforms

   Giga-projects like NEOM and national platforms like SEHA offer natural testbeds for predictive healthcare ecosystems. GT can help design operating models where AI analytics, digital records, and continuous monitoring co-exist, positioning Saudi Arabia as a global reference site for real-world predictive health.

4. Monetising Health Data Responsibly

   Biochemical sensors will create unprecedented datasets from Middle Eastern populations, who are underrepresented in global research. Properly anonymised and governed, these can attract global partnerships with life sciences firms, AI companies, and research institutions. GT can support regulators in structuring governance regimes that protect privacy while unlocking value.

5. Scenario Planning and Risk Management

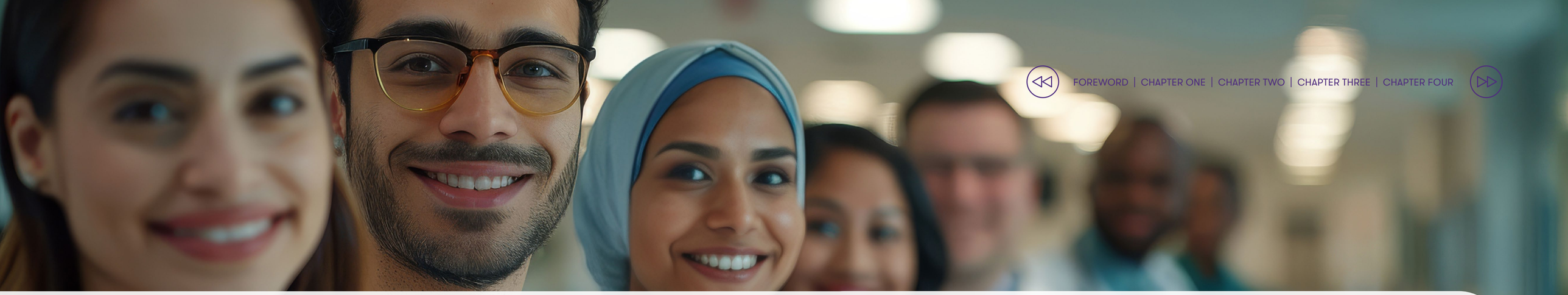
   Adoption at scale will face hurdles from cybersecurity risks to patient resistance. Through scenario modelling and risk advisory, GT can help institutions stress-test strategies, ensuring resilience under different adoption, cost, or regulatory scenarios.

An Innovative Role for Saudi Arabia

Autonomous biochemical sensing offers the Kingdom a unique opportunity to lead globally in predictive healthcare. By embedding sensors into its health system, Saudi Arabia can:

- Redefine preventive medicine shifting from illness treatment to wellness management.
- Showcase global leadership at Hajj and Umrah in mass-scale health monitoring.
- Advance inclusion and resilience through women's health and rural healthcare integration.
- Create new industries in data, AI, and digital health that extend beyond the health sector.

In this light, biochemical sensing is more than a device innovation. It is a strategic national lever, enabling Saudi Arabia to set a new global benchmark for healthcare resilience, inclusivity, and innovation.



From Adoption to Leadership

Saudi Arabia is not merely preparing to adopt the future of healthcare, it is creating it. By aligning its biotechnology strategy, digital-first delivery platforms, and clinical research ambitions under Vision 2030, the Kingdom has the rare ability to leapfrog traditional models and set the global standard for healthcare transformation.

For many nations, emerging technologies such as engineered living therapeutics, GLP-1 applications, and autonomous biochemical sensing remain distant prospects. In Saudi Arabia, they are near-term enablers of economic diversification, resilience, and social well-being. The Kingdom's scale, sovereign capital, and giga-project ecosystems give it an unmatched platform to convert innovation into impact.

At Grant Thornton, we see the next phase not as adoption but as leadership. Leadership means exporting therapies and governance frameworks, becoming the testbed where frontier innovations are proven, and shaping global health agendas rather than reacting to them. It means transforming healthcare from a national priority into a global industry in which Saudi Arabia is a standard-setter, investor, and innovator.

Our role is to accelerate that journey bringing assurance that builds trust, regulatory insight that enables agility, and strategic advisory that converts vision into delivery.

Vision 2030 is not only about benchmarks achieved; it is about establishing the Kingdom as a global leader in the industries of the future. In healthcare, Saudi Arabia is positioned not just to keep pace with innovation, but to define it.

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