Section 3.1 – Landscape Analysis & Horizon Scanning: Seeing the Future of Glaucoma and Philanthropy

Introduction: The Visionary's Imperative

Dr. Steel, your transition to leading the Glaucoma Research Foundation is not merely about managing current operations; it's about steering a vital organization through a rapidly evolving landscape. In the for-profit world, "horizon scanning" helps companies anticipate market shifts and competitive threats. In the non-profit sector, particularly one dedicated to medical research, it's about foreseeing scientific breakthroughs, understanding shifts in healthcare policy, adapting to philanthropic trends, and responding to changing societal needs. This foresight is what allows a non-profit to remain relevant, maximize its impact, and ultimately achieve its audacious mission.

This chapter will equip you with a systematic approach to analyzing the external environment, enabling you to "see the future" for GRF. By understanding the forces at play—from the laboratory bench to global demographics—you can proactively position GRF to accelerate research, expand awareness, and secure the resources needed to make glaucoma a disease of the past.

1. Scientific & Technological Foresight: The Next Frontier in Vision Science

The pace of scientific and technological advancement in ophthalmology and neurodegeneration is breathtaking. For GRF, staying ahead means not just funding current research, but anticipating the next wave of breakthroughs and understanding their potential to transform glaucoma care.

1.1. Monitoring Breakthroughs: Genomics, AI, Gene Therapy, and Stem Cells

- **Genomics and Gene Therapy:** The ability to understand and manipulate genetic material is revolutionizing medicine. Gene therapies aim to correct underlying disease causes, sometimes with a single injection, by modifying existing or introducing new genetic material into cells.[1] This is particularly relevant for inherited forms of glaucoma.
    - **Real-World Example (Beyond GRF):** Scientists at Trinity College Dublin have developed a novel gene therapy approach that decreased intraocular pressure (IOP) in pre-clinical models of glaucoma by delivering an enzyme that increases

fluid outflow.[2] This work, bridging academia and industry, highlights the potential for gene therapy to move from rare diseases (where most approved gene therapies currently exist) to common conditions like glaucoma.[2]
    - **GRF's Exemplification:** GRF is actively funding research in this area. The 2025 Shaffer Grants include projects on "Gene Therapy specifically targeting MYOC-related glaucoma" and "Reintroducing Developmentally Regulated Guidance Factors to the Optic Nerve" to promote optic nerve regeneration.[3] The Catalyst for a Cure (CFC) Vision Restoration Initiative (CFC3) is also pursuing discoveries in gene manipulation and stem cell replacement.[5]
- **Artificial Intelligence (AI) in Ophthalmology:** AI is transforming healthcare by improving diagnosis accuracy, personalizing treatment plans, and streamlining clinical workflows.[8] In ophthalmology, AI algorithms can analyze retinal images and visual field tests for early detection of conditions like diabetic retinopathy, age-related macular degeneration (AMD), and crucially, glaucoma.[8]
    - **Real-World Example (Beyond GRF):** Researchers have trained AI models to identify retinal photo features associated with Alzheimer's disease, hoping that routine eye exams could soon include screenings for neurodegenerative conditions.[9] This demonstrates the cross-disease potential of AI in eye care.
    - **GRF's Exemplification:** The Glaucoma Foundation (a related entity, but indicative of the broader field's direction) has received a $2.5 million gift to establish a chair in Glaucoma Research and Innovation, supporting work that includes "artificial intelligence and digital twin applications that are enhancing our understanding of disease progression".[10] This signals a clear embrace of AI's potential in glaucoma research.
- **Neurodegeneration Research (Beyond Glaucoma):** Glaucoma is now understood as a neurodegenerative disease, akin to Alzheimer's and Parkinson's.[5] Breakthroughs in these broader fields can directly inform glaucoma research.
    - **Real-World Example (Beyond GRF):** Researchers at WEHI in Australia recently discovered a small molecule that can selectively block cell death by interfering with a "killer protein" called BAX. This finding lays the groundwork for next-generation neuroprotective drugs for conditions like Parkinson's and Alzheimer's, which currently lack cures or treatments to stop progression.[12]
    - **GRF's Exemplification:** GRF's fourth Catalyst for a Cure (CFC4) team, launched in 2022, is specifically "investigating how and why specialized cells in the eye, brain, and spinal cord deteriorate and die, in search of preventative measures and cures for all neurodegenerative conditions".[5] This direct focus on cross-disease mechanisms positions GRF to leverage broader neuroscience discoveries.

1.2. Drug Development Pipeline and Regulatory Landscape

- **Sustained Drug Delivery:** A significant trend in ophthalmology is the shift towards

sustained drug delivery systems, which aim to simplify treatment regimens, reduce side effects, and improve adherence for lifelong conditions like glaucoma.[13] This includes implants, drug-eluting contact lenses, and devices worn under the eyelid.[13]
    - **Real-World Example:** Several sustained-release drugs for IOP lowering are already on the market (e.g., iDose) or in late-stage clinical trials (e.g., PolyActiva's Latanoprost FA SR Ocular Implant, SpyGlass Pharma's bimatoprost-eluting IOL).[13] Nicox is also preparing for FDA submission of NCX 470, a novel nitric oxide-donating eye drop.[14]
    - **GRF's Strategic Relevance:** While GRF primarily funds early-stage research, understanding this pipeline is crucial for identifying promising areas for future investment and for ensuring that GRF-funded discoveries have a clear path to clinical translation. The Glaucoma 360 New Horizons Forum explicitly brings together "clinical, industry, financial, and FDA leaders" to discuss advancements in glaucoma treatment.[15]
- **Regulatory Landscape:** The path from laboratory discovery to FDA approval is long and complex. Understanding regulatory requirements (e.g., for New Drug Applications, clinical trial phases) is vital for accelerating therapies.
    - **Real-World Example:** The Denali and Mont Blanc trials for NCX 470 were designed to fulfill clinical regulatory requirements for NDA submissions in the US and China, with an estimated FDA submission in early 2026.[14] This illustrates the rigorous process involved.
    - **GRF's Strategic Relevance:** GRF's CFC3 initiative aims for a neuroprotective clinical trial by 2025 and a path for vision restoration clinical trials by 2027.[15] This aggressive timeline necessitates a keen awareness of regulatory pathways and potential hurdles.

2. Healthcare Policy & Funding Trends: The Shifting Sands of Support

Government policies and funding priorities significantly influence the landscape of medical research and patient access. Non-profit leaders must monitor these trends to advocate effectively and align their strategies.

2.1. Shifts in Government Funding for Medical Research

- **NIH and NEI Priorities:** The National Institutes of Health (NIH) is the largest public funder of biomedical research in the U.S., with a budget of roughly $47 billion in FY2024.[16] Its funding priorities shape the direction of scientific inquiry.
    - **Real-World Example:** The NIH Common Fund's High-Risk, High-Reward Research program offers awards for "exceptionally creative scientists to pursue highly innovative approaches to address major challenges in biomedical or

behavioral research," welcoming any topic relevant to the broad NIH mission.[17] This aligns with GRF's "high-risk/high-reward" Shaffer Grants.[7]
    - **GRF's Strategic Relevance:** GRF's Shaffer Grants often serve as "seed funding" that leads to larger grants from the NIH.[18] Maintaining strong relationships with NIH and National Eye Institute (NEI) officials, understanding their strategic plans, and aligning GRF's research priorities with broader national health goals can enhance GRF's ability to leverage public funding. Advocacy for predictable, robust, and sustained public investments in biomedical research is a national priority.[16]
- **Administrative Burden and Talent Retention:** Concerns exist about the administrative burden for grant applications and the need to retain talented mid-career researchers who might leave academia for more competitive funding and salaries.[16]
    - **GRF's Strategic Relevance:** GRF's focus on "Build and Strengthen Leadership" [15] and its investment in professional development for staff [15] directly address talent retention, making GRF an attractive partner for researchers seeking a more supportive environment.

2.2. Healthcare Reimbursement Models and Legislative Changes

- **Reimbursement Trends:** Changes in healthcare reimbursement models, particularly from Medicare, can impact the financial viability of ophthalmic practices and patient access to care. Medicare physician payments have significantly decreased (e.g., 26% from 2001 to 2023, adjusted for inflation).[19]
    - **Real-World Example:** Studies show that submitted charge-to-Medicare payment ratios for ophthalmic procedures and consultations have steadily increased, suggesting that inflation-adjusted Medicare payments are not keeping pace with physician charges.[19] This can lead to higher out-of-pocket costs for uninsured patients or those with out-of-network commercial insurance.[20]
    - **GRF's Strategic Relevance:** These trends impact the very eye care professionals who diagnose and treat glaucoma, and who serve as GRF Ambassadors.[21] Understanding these financial pressures can inform GRF's patient advocacy efforts and its strategies for promoting early detection and access to care.
- **Legislative Changes Affecting Patient Access:** New legislation can impact how healthcare is delivered and accessed.
    - **Real-World Example:** The "Patient Access to Higher Quality Health Care Act of 2025" aims to eliminate regulations restricting physician-owned hospitals, with proponents arguing this will increase competition, drive down costs, and expand access to quality care.[22] Another bill, the "Improving Access to Health Care in Rural and Underserved Areas Act," seeks to establish programs ensuring access to accredited continuing medical education for primary care physicians at

Federally-qualified health centers (FQHCs) and rural health clinics.[23]
    - **GRF's Strategic Relevance:** GRF's strategic plan includes building "strategic partnerships with providers... FQHCs and other healthcare organizations" for awareness and outreach activities.[15] Monitoring legislation that impacts FQHCs or expands access to care in underserved areas is crucial for GRF's "Expand Awareness" imperative, especially for high-risk communities.[15]

3. Philanthropic Landscape: The Evolving Art of Giving

The way individuals, foundations, and corporations engage in philanthropy is constantly shifting. Understanding these trends is vital for GRF to maximize its philanthropic support.

3.1. Emerging Trends in Donor Motivations and Giving Vehicles

- **Donor-Advised Funds (DAFs):** DAFs have emerged as a significant force in philanthropy, offering donors flexibility and convenience. Contributions to DAFs have grown rapidly, reaching $254 billion in assets in 2023.[24] While they facilitate billions in grants, some critics raise concerns about payout rates and anonymity.[24]
    - **Real-World Example:** In 2023 alone, $55 billion in grants were distributed from DAFs.[25] National sponsors (large DAF providers) held 70% of DAF assets and accounted for 73% of contributions in 2023.[24]
    - **GRF's Strategic Relevance:** As DAFs become a preferred giving vehicle, GRF must actively engage with DAF holders and their advisors. This means understanding how to communicate GRF's impact effectively to DAF donors and ensuring GRF is easily discoverable and recommended by DAF sponsors.
- **Impact Investing:** This growing field seeks to generate positive, measurable social or environmental impact alongside a financial return.[26] It challenges the traditional view that social issues are solely the domain of philanthropy.
    - **Real-World Example:** The global impact investing market reached $715 billion in 2020, with a significant portion going towards healthcare.[26] Examples include investments in affordable vaccines and programs addressing malnutrition.[26]
    - **GRF's Exemplification:** GRF's explicit interest in "Investigating the feasibility of Venture Philanthropy" [15] directly aligns with this trend. Venture philanthropy, a subset of impact investing, focuses solely on maximizing societal benefits, but often uses financial instruments (like recoverable grants or equity stakes) that can generate returns for reinvestment into the mission.[28] This could be a transformative funding model for GRF's treatment acceleration efforts.

3.2. Corporate Social Responsibility (CSR) Evolution

- **Pharmaceutical Industry CSR:** Pharmaceutical companies are increasingly integrating social responsibility with public health needs, addressing issues like affordable healthcare, wellness promotion, and environmental preservation.[30] CSR activities can include providing life-saving pharmaceuticals to underprivileged populations, funding public health programs, and sponsoring research into neglected ailments.[30]
    - **Real-World Example:** Many pharmaceutical companies have shifted R&D focus towards neglected tropical diseases or engage in vaccine donations and differential pricing strategies to enhance access to essential medicines in underserved regions.[31]
    - **GRF's Strategic Relevance:** GRF already partners with **Bausch + Lomb** on the "Faces of Glaucoma" campaign.[32] Expanding partnerships with pharmaceutical and biotech companies through their CSR initiatives could unlock significant funding and collaborative research opportunities, especially as GRF's research moves closer to clinical trials and potential commercialization. GRF's Strategic Advisory Council, composed of "key industry leaders and corporate community members" [32], is a direct mechanism for cultivating these relationships.

3.3. Innovative Fundraising Technologies

- **Digital Fundraising:** Online giving continues to grow, with mobile donations comprising 45% of online donations in 2024.[33] Email remains a preferred communication method for donors, and employer matching programs significantly increase giving likelihood.[33]
    - **Real-World Example:** GivingTuesday 2024 raised $3.6 billion, a 16% increase from the previous year.[33]
    - **GRF's Exemplification:** GRF has already invested in a comprehensive brand and platform refresh, redesigning its websites and implementing a new donation management platform that simplified giving, enabled Apple Pay, and led to significantly increased online donations, particularly from mobile users.[34] This demonstrates GRF's proactive embrace of digital fundraising trends.

4. Demographic & Societal Shifts: Understanding the Patient Landscape

Glaucoma is a global health challenge, and its impact is not evenly distributed. Understanding demographic shifts and health disparities is crucial for effective patient care and advocacy.

- **Aging Population:** Glaucoma risk increases with age, making it a growing concern in an

aging global population.[35]

- **Health Disparities:** Glaucoma-related blindness is 6 to 8 times more prevalent in African Americans than in Caucasians, and African Americans experience higher rates of glaucoma at younger ages.[35] Fifty percent of glaucoma cases worldwide are still undetected.[36]
    - **Real-World Example:** A GRF survey found that 16% of African Americans surveyed were unaware of glaucoma as a condition, compared to 9% of Caucasians.[35] Many incorrectly believe glaucoma has noticeable symptoms or is easily treatable.[35]
    - **GRF's Strategic Relevance:** GRF's strategic plan explicitly aims to "Increase public awareness of glaucoma risk factors, particularly for high-risk communities," and to "Develop culturally appropriate educational materials for affected populations (African American, Latino, and Asian American communities)".[15] This targeted approach is vital for addressing health equity.
- **Patient Advocacy Movements:** Empowered patients and advocacy groups play an increasingly active role in shaping research priorities and demanding access to care.
    - **Real-World Example:** Organizations like the EB Research Partnership (EBRP) are patient-led non-profits that have pioneered venture philanthropy models to accelerate rare disease cures, demonstrating the power of patient advocacy in driving research.[29]
    - **GRF's Exemplification:** GRF's Glaucoma Patient Summit [6] and the "Faces of Glaucoma" campaign [36] actively engage patients and caregivers, providing a platform for their voices and experiences to inform GRF's work. The GRF Ambassadors program, a national group of eye doctors, also advocates for patients and assists with educational materials.[21]

5. Competitive/Collaborative Landscape: Mapping the Ecosystem

No single organization can solve a complex global health problem alone. Understanding the ecosystem of other players—both collaborators and potential competitors—is essential for strategic positioning.

- **Other Glaucoma Research Organizations:**
    - **Real-World Example:** Key organizations dedicated to finding treatments and a cure for glaucoma in the U.S. include the American Glaucoma Society (AGS), The Glaucoma Foundation (TGF), and BrightFocus Foundation.[39]
    - **GRF's Strategic Relevance:** GRF is recognized as a collaborating organization with AGS.[40] Understanding the specific niches and funding priorities of these organizations can help GRF identify opportunities for co-funding, shared research initiatives, or complementary advocacy efforts.
- **Leading Ophthalmology Academic Centers:** These institutions are hubs of

cutting-edge research and clinical trials.
    - **Real-World Example:** Top ophthalmology hospitals and academic centers in the U.S. include Bascom Palmer Eye Institute, Wills Eye Hospital, Wilmer Eye Institute (Johns Hopkins), Massachusetts Eye and Ear Infirmary, and Stein and Doheny Eye Institutes (UCLA).[41] GRF's Catalyst for a Cure program explicitly recruits scientists from "prestigious academic centers across the country".[7]
    - **GRF's Strategic Relevance:** Maintaining strong relationships with these centers is crucial for attracting top research talent, fostering collaborative projects, and ensuring GRF-funded discoveries are integrated into clinical practice. GRF's 2024 IRS Form 990 shows grants to institutions like U.C. Davis, U.C. San Diego, U.C. San Francisco, Stanford University, and Massachusetts Eye & Ear.[42]
- **Biotech and Pharmaceutical Industry:** These companies are critical for translating research into commercialized therapies.
    - **Real-World Example:** Companies like Roche are focusing on pioneering therapies to prevent vision loss, with areas of interest in ophthalmology, neuroscience, and rare diseases.[43]
    - **GRF's Strategic Relevance:** GRF's Glaucoma 360 New Horizons Forum specifically brings together "industry, financial, and FDA leaders" [6] to accelerate new therapies. This direct engagement with industry is vital for understanding commercialization pathways and potential partnerships for GRF-funded research.

Conclusion: The Strategic Imperative of Foresight

Dr. Steel, your ability to "see the future" in this complex landscape will be your most powerful asset as CEO of the Glaucoma Research Foundation. This systematic approach to landscape analysis and horizon scanning is not an academic exercise; it is a dynamic, ongoing process that directly informs GRF's strategic decisions.
By continuously monitoring:

- **Scientific and technological advancements**, you can ensure GRF's research remains at the cutting edge, identifying the most promising avenues for a cure.
- **Healthcare policy and funding trends**, you can advocate effectively, adapt GRF's financial strategies, and ensure patient access to emerging treatments.
- **The evolving philanthropic landscape**, you can diversify GRF's revenue streams, engage donors more effectively, and explore innovative funding models like venture philanthropy.
- **Demographic and societal shifts**, you can tailor GRF's awareness and education programs to reach underserved communities and address health disparities.
- **The competitive and collaborative ecosystem**, you can identify strategic partnerships that amplify GRF's impact and accelerate its mission.

This comprehensive foresight will enable you to make informed, proactive decisions, positioning GRF not just as a leader in glaucoma research, but as a visionary force driving

tangible progress toward a future free from glaucoma. This is the essence of strategic leadership in the non-profit world.