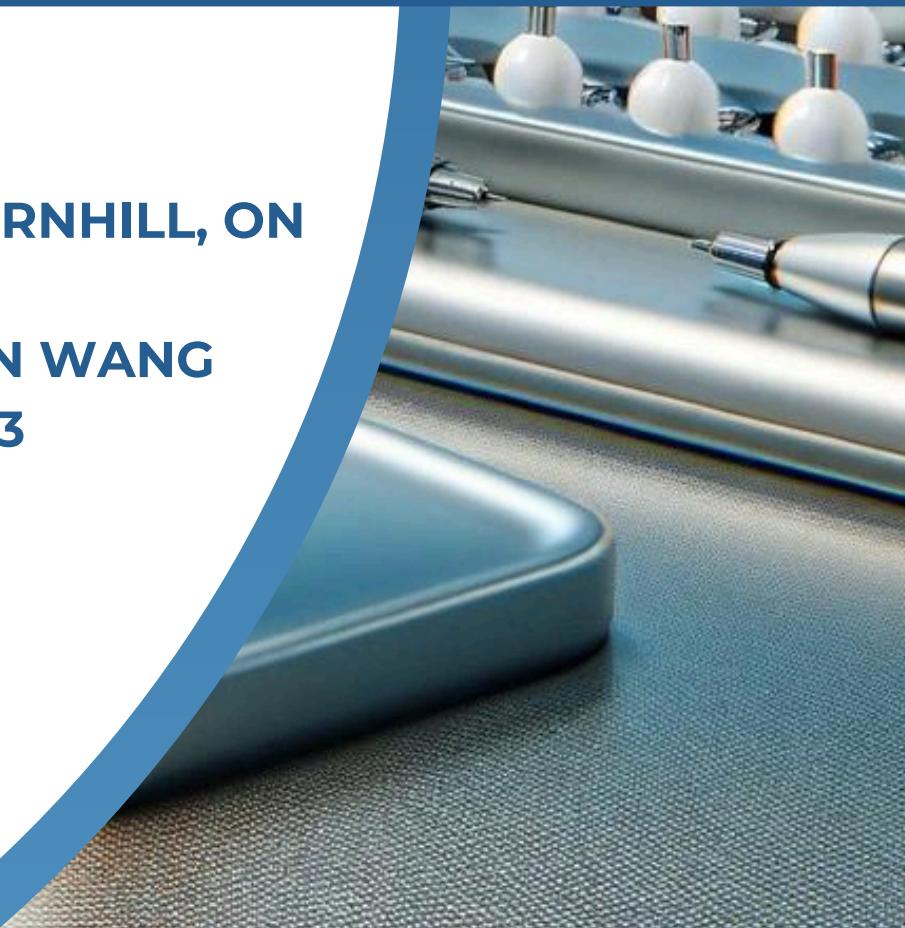




SANOPEN

**INNOVATION PLAN
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ANTHONY LI, ETHAN WANG
JANUARY 15TH, 2023**





CONSANO

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I. EXECUTIVE SUMMARY

Consano, is the word of healing in Latin. The SanoPen, our creation, embodies this very essence of healing. It's a beacon of hope in a world where biological limitations prolong recovery and where treatments are barricaded behind high costs and logistical impracticalities. This pen-like device is a marvel of modern technology, encapsulating the power of laser therapy to amplify the body's natural healing process. It's a tangible promise of quicker recovery, reduced risks, and accessible wellness. **SanoPen, in its compact, innovative design, represents not just a solution but a revolution in healing - making the art of recovery an accessible, efficient reality.**

|  Problem |  Solution |
|---|--|
| <u>Human Body's Innate Inefficiency:</u> The biological slow wound healing poses increased risks on infections, scarring, and diseases. | <u>Revolutionary Technology:</u> By using lasers to transmit energy in cells, our laser therapy technology speeds up the cellular process of healing, oxygen flow, and ATP production |
| <u>Risk of Disease:</u> Chronic wounds means those with weaker immune systems take longer time to heal and therefore these actors are especially prone to complications. | <u>Convenience:</u> Ground Breaking Technology in the palm of your hand, ready to use for your wounds. Every. Single. Injury. |
| <u>Inaccessibility:</u> Impracticality of current treatment systems: treatment is inaccessible. To access similar treatments or technologies in the status quo, it's incredibly expensive to make regular hospital visits. | <u>Increasing Worldwide Accessibility:</u> Making currently inaccessible red light laser therapy widely accessible in international markets, in all retail shops, in the palm of your hands. |

CUSTOMER DEMOGRAPHICS

1. Retail Shops: For Individuals of all ages, occupations, and lifestyles.
 Ages 0-99
 All Incomes
All people get injured.



2. Hospitals: Advanced Healing for Doctor use
 For hospitals, to improve their everyday operations.
 Add a tool to their toolbox in assisting patients.



3. NGOs: Bridging the Healthcare Gap in Developing Nations
 In regions vulnerable to diseases, rapid healing isn't just a comfort; it's a necessity. With Sano-Pen, NGOs can provide a tool that accelerates the healing process, saving lives in areas where medical facilities are sparse or overwhelmed.



YEAR 1 FINANCIALS

| | Year 1 |
|--------------------|------------------------------|
| Development | \$50,000 |
| Testing | \$130,000 |
| Marketing | \$200,000 |
| Manufacturing | \$1,280,000 = 40,000 pens |
| Operating Expenses | \$500,000 |

UNIQUE VALUE PROPOSITION

Reduced Complications:
 By expediting tissue repair, Sanopen minimizes susceptibility to infections and mitigates the detrimental consequences of prolonged healing. This is especially critical for individuals with compromised immune systems.

Accessibility and Affordability: SanoPen breaks down barriers to effective wound care by offering an accessible, at-home solution. In contrast to expensive hospital visits, our product provides an affordable and user-friendly alternative.

Cellular Precision:
 SanoPen utilizes lasers to transmit energy directly into cells, unlocking a cascade of benefits. This precise approach enhances cellular processes, addressing the root cause of slow wound healing.



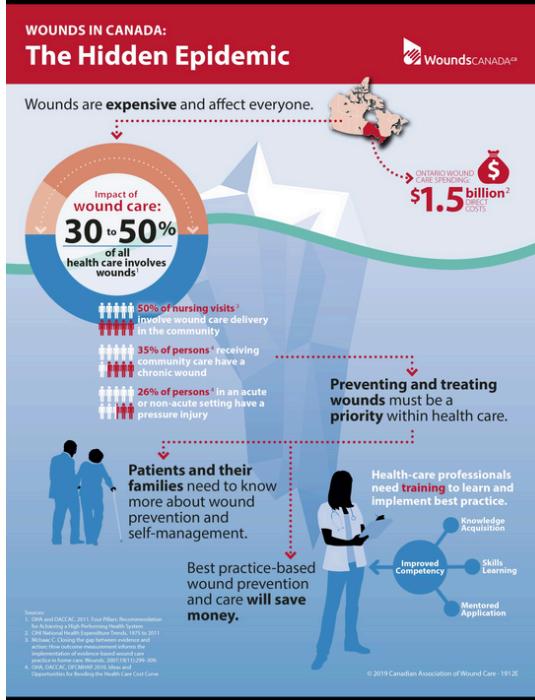
II. PROBLEM



Biologically Slow Wound Healing

Around **7 to 9 million people** go to hospitals for external lacerations (cuts) annually, and there are also many unreported lacerations. The prolonged biological nature of traditional wound healing presents significant challenges and risks, Wounds generally heal in **4 to 6 weeks**. This timeframe increases the risk of **complications** particularly in terms of complications like **infections and scarring**.

Studies find the infection rate to be 20% among the general population, and 25% among those above 60 years old.



Complications With Chronic Wounds

A chronic wound is a wound that fails to progress through the normal stages of healing in a timely manner, typically remaining open for more than 30 days.

- Affect 38.4 million people in the U.S.
- Prevalent in the aging population, along with patients with illnesses such as diabetes, and hypertension

A chronic wound is a wound that fails to progress through the normal stages of healing in a timely manner, typically remaining open for more than 30 days. Known as the silent epidemic, chronic wounds, or wounds that are slow to heal currently affect 6.5 million people in the U.S. and the numbers will likely increase, according to the U.S. National Institutes of Health.

Unlike acute wounds, which heal predictably, chronic wounds stall in one phase of healing. Chronic wounds are prevalent in the aging population, along with patients with illnesses such as **diabetes, vascular deficits, hypertension, and chronic kidney disease**. These wounds can become persistent, painful, and pose significant health risks. **This is the most vulnerable group.**

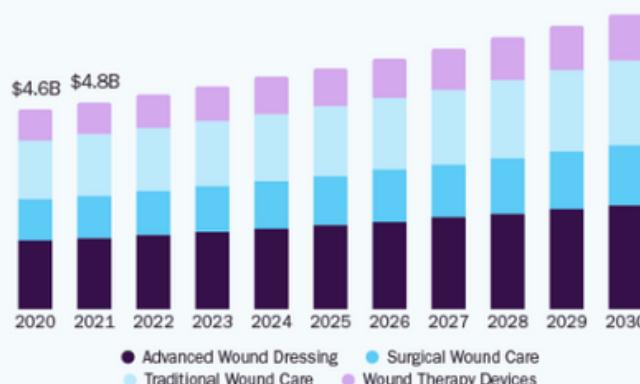
Chronic wounds often:

- remain in the inflammatory stage for too long.
- Not enough blood flow, leading to a lack of oxygen and nutrients
- Induce permanent scarring

A solution that assists the human body in these processes will help expedite the process of healing chronic wounds. **Currently, only a very small percent of wounds are cared for via therapy devices due to a lack of accessibility (see diagram below).**

U.S. Chronic Wound Care Market

size, by product, 2020 - 2030 (USD Billion)





Impracticality Of Treatment Leads To Inaccessibility

The accessibility of advanced wound care technologies like the Sano-Pen varies significantly across different healthcare systems, including paid healthcare systems like in the United States, publicly funded systems like in Canada, and regions without solid healthcare infrastructure. In all systems, a solution is needed to solve these issues.

In Paid Healthcare Systems (e.g., the United States)

- Regular dressings, hospital stays, medications, and treatments for complications can all add up. In the US, the average per-day hospital cost is \$2,883, but the average stay is 4.5 days equaling \$12,974. Chronic or complicated wounds are a significant concern in this context, given the considerable expenses associated with their prolonged treatment.

Enhancing the accessibility of innovative and effective wound care devices can significantly reduce these costs. In the US, an estimated 112 million (44%) American adults are struggling to pay for healthcare. Reducing the time spent in hospital will reduce these costs, thus allowing more affordable healthcare.

In Publicly Funded Healthcare Systems (e.g., Canada)

- Resource Constraints: Even though healthcare is publicly funded, systems like Canada's face challenges in terms of resource allocation. Prolonged treatments for chronic wounds can strain these resources, leading to longer wait times and potentially impacting the quality of care. Many people cannot find the time out of their day to book appointments, thereby making healthcare even in free systems inaccessible.

In Regions Without Solid Healthcare Systems

- Lack of Access to Basic Medical Care: In areas with underdeveloped healthcare systems, access to even basic medical care is a challenge, let alone advanced wound care treatments.
- Unavailability of Specialized Treatments: Advanced treatments for chronic wounds, such as those requiring specialized medical equipment or expertise, are often unavailable.
- Dependence on External Aid: These regions often rely on NGOs and international aid for healthcare, which may not always be equipped to provide long-term or specialized wound care.

A low cost, easy to use solution can mitigate many of these accessibility challenges by providing an affordable, effective, and easy-to-use solution for wound care. Its lower cost and ease of use make it a practical option in paid healthcare systems, reducing the financial burden on patients. In publicly funded systems, it can alleviate the pressure on healthcare resources by reducing the need for prolonged treatments and frequent medical visits.

In regions with underdeveloped healthcare infrastructure, its simplicity and portability make it a viable option, potentially increasing the reach of effective wound care to more people.



III. CUSTOMER SEGMENTS

1. Retail Shops: For Individuals of all ages, occupations, and lifestyles.

Every home's first aid box can be revolutionized with the Sano-Pen. For those unexpected moments - be it a kitchen burn, a playground scrape, or a paper cut - the Sano-Pen offers immediate and effective relief. This applies to ALL people.

Important Numbers:

- 26% of the general population faces infection risks from open wounds (source: studies).
- 40% to 94% of patients may develop hypertrophic scars or keloids due to slow healing (source: statistics).
- 44% of American adults struggle to pay for healthcare (source: statistics).

Reduced time spent in hospitals can significantly cut healthcare costs, making it more affordable for millions (source: statistics).

The average per-day hospital cost in the U.S. is \$2,883 (source: statistics).

Especially Vulnerable Target Groups:

Niche Target Group #1: Individuals with diabetes facing challenges in wound healing.

- Chronic wounds affect 6.5 million people in the U.S. (source: U.S. National Institutes of Health).
- Over a quarter of people with diabetes have wounds that do not heal, due to a lack of blood flow

Niche Target Group #2: Seniors facing slower healing processes.

Infection rates among those above 60 years old can be as high as 25% in parts of the population (source: studies).

Chronic wounds contribute to the escalating costs of wound care for aging populations.



Behavioral Analysis

"The very concept of being able to expediently heal wounds resonates deeply with our fundamental instinct for self-preservation and care. In a world where uncertainty and risk are ever-present, the Sano-Pen offers a sense of security and empowerment, allowing individuals to manage their own or their loved ones' health more effectively. This is particularly compelling in the context of rising healthcare costs and the psychological burden of potential financial strain. The Sano-Pen, being affordable and easy to use, aligns with the psychological need for cost-effective solutions that don't compromise on efficacy." - Tanush Agarwal (Oxford Philosophy Student)





2. Hospitals: Advanced Healing for Critical Care

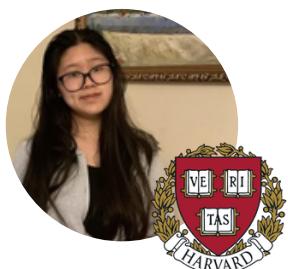
The primary incentive for hospitals is the potential for accelerated wound healing offered by the Sano-Pen. Faster recovery rates can improve patient outcomes, reduce the risk of complications such as infections or prolonged healing, and enhance overall patient satisfaction.

Chronic Wounds: For patients suffering from conditions like diabetes, which impede the natural healing process, the Sano-Pen can increase blood flow, speeding up recovery and improving quality of life for these patients. **This is a market that hospitals are able to tap into and use as an alternative to more expensive procedures, such as surgery.**

Post-Surgical Healing: Surgeries, no matter how minor, come with recovery periods. With the Sano-Pen, hospitals can offer patients a shortened recovery time, **enhancing patient satisfaction**. This also saves time on the recovery period, **clearing up Emergency rooms** for other patients.

Emergency Services: EMTs and paramedics equipped with the Sano-Pen can initiate the healing process en route to the hospital, with millions of patients going to the hospital every day, each millisecond saved would make a big difference. Around **7 to 9 million** people go to hospitals for external lacerations (cuts) annually, and these are millions of patients that could be saving money, and time using the Sano-Pen.

Sports Medicine: In sports, where injuries like cuts, bruises, and muscle strains are frequent, the Sano-Pen can offer immediate relief. Its portability allows for quick, on-the-spot treatment, potentially speeding up the recovery process and reducing the downtime for athletes. This is crucial for athletes who need to return to peak performance levels as quickly as possible.



"Sanopen isn't just a step forward in wound care; it's a giant leap for patient recovery. Harnessing the untapped potential of low-level laser therapy, it's revolutionizing how we approach wound healing and setting a new gold standard in the medical field." - **Maria Xu (Harvard 27' MedSci Student)**

3. NGOs: Bridging Healthcare Gaps Developing Nations



In regions vulnerable to diseases, rapid healing isn't just a comfort; it's a necessity. With Sano-Pen, NGOs can provide a tool that accelerates the healing process, saving lives in areas where medical facilities might be sparse or overwhelmed. **We plan to sell to NGO organizations such Save the Children, UNICEF and the Red Cross.**

IV. UNIQUE VALUE PROPOSITION



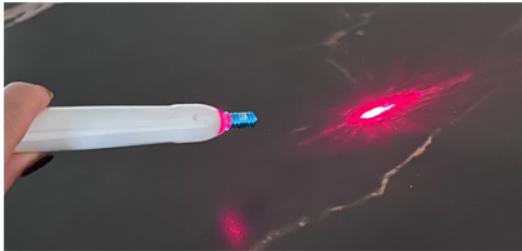
SanoPen meets the pressing market need for an innovative, scientifically backed solution to the challenges of slow wound healing. Our product not only addresses biological limitations but also bridges the gap in accessible and practical wound care.

| <h3>Market Exclusivity</h3>  | <h3>Addressing Everyday Challenges</h3>  | <h3>Making Red Light Laser Therapy Accessible</h3>  |
|--|--|--|
| <p>Sanopen is a groundbreaking advancement in the realm of wound care, distinguishing itself as the sole device on the market that targets this specific medical niche with such precision and effectiveness. It stands out by offering an unparalleled solution for those who previously had no other viable options for expedited wound healing.</p> | <p>This state-of-the-art device taps into the unexplored potential of low-level laser therapy, a technique that has been meticulously tailored to accelerate the cellular healing process. With its focus on enhancing recovery times, Sanopen addresses the critical challenges faced in wound management, including the risks of prolonged infections, scarring, and the increased vulnerability of individuals with compromised immune systems.</p> | <p>SanoPen is the only sort of product that is able to fit this technology within the palm of a hand. This aspect is particularly beneficial in the current healthcare landscape, where balancing quality patient care with cost-effectiveness is a paramount concern.</p> |

"SanoPen, crafted by two remarkable high school students, stands as a shining beacon of youthful innovation and potential. Their work not only highlights the extraordinary capabilities of our young minds but also underscores the importance of nurturing and investing in the next generation of thinkers and creators. Their achievement in advancing medical technology is a source of inspiration and a testament to the bright future of our society."
- Paul Chiang (Former Member of Parliament for Markham-Unionville)



V. SOLUTION



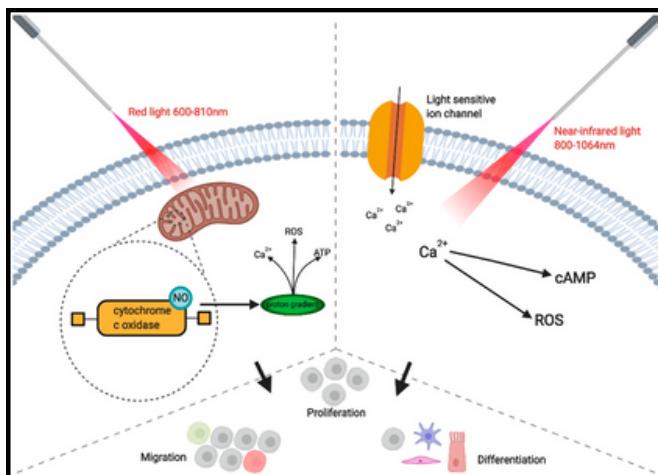
WHAT IS INCLUDED?

Laser Diode: The heart of the SanoPen is its laser diode, which emits the specific wavelength of red light required for therapeutic purposes. This diode is carefully selected to ensure the optimal balance of intensity and safety for skin penetration and cellular stimulation.

Power Source: The device is powered by a battery, which is rechargeable to any regular plug. The power source is reliable and long-lasting to ensure consistent operation of the laser diode.

THE SCIENCE BEHIND IT

- The application of red light (600-810 nm) is absorbed by the enzyme cytochrome c oxidase in the mitochondria, leading to increased calcium ions, reactive oxygen species (ROS), and ATP production.
- Near-infrared light (810-1064 nm) activates light-sensitive ion channels, increasing levels of Ca²⁺, ROS, and cyclic AMP (cAMP), resulting in enhanced cell differentiation, proliferation, and migration.



Control Circuitry: This includes the electronic components that regulate the power supply to the laser diode, ensuring that it emits light at the correct intensity and wavelength. This circuitry might include a timer or pulse regulator to control the duration and pattern of the light therapy.

Protective Casing: The external casing of the SanoPen is designed for durability and user comfort. It's made of coated plastic that is easy to clean and resistant to wear and tear. The ergonomic design is also crucial, allowing for easy handling and application of the device.

Lens and Focus System: To ensure that the red light is directed precisely at the area of treatment, the SanoPen includes a lens system. This system focuses the light beam, enhancing its therapeutic effectiveness, as well as ensuring its wavelength is at the right energy level.

In a report titled published in the *National Library of Medicine*, **positive effects** of low-level laser therapy on **wound healing** are highlighted, with **enhanced expansion of blood vessels and cells**.

Another study published in the National Library of Medicine demonstrates that red and near-infrared light stimulation alters cellular function, increases metabolism, and heavily **accelerates the production of new cells**, as well as **increased blood flow**.



OUR PRODUCT USES

2 TYPES OF LIGHT THERAPY :

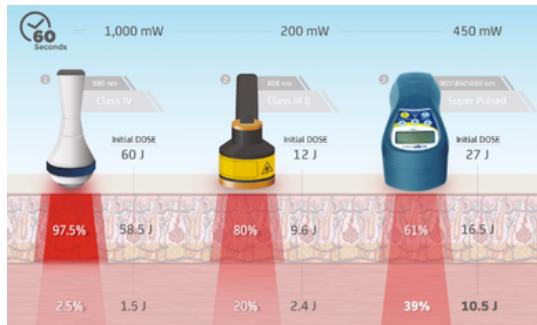
Red Light Therapy (600-810 nm):

- When cells are exposed to red light, it is absorbed by a specific enzyme in the mitochondria called cytochrome c oxidase.
- Cellular Effects: This absorption triggers a series of events. It increases the production of energy molecules (ATP), calcium ions, and reactive oxygen species (ROS).
- Overall Impact: As a result, cells become **more active and energetic**. This boost can help in repairing and rejuvenating cells.
- This increases cell division rate by up to 30%

Near-Infrared Light Therapy (810-1064 nm):

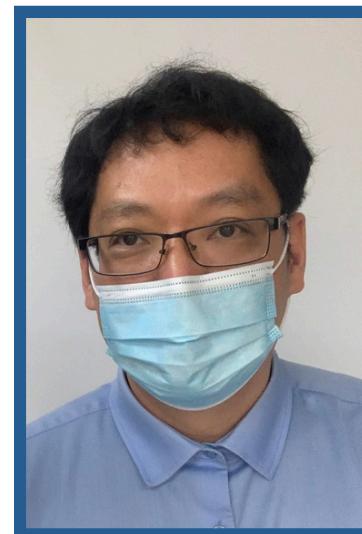
- What Happens in the Cells: Near-infrared light affects cells differently. It activates certain channels in the cell that are sensitive to light.
- Cellular Effects: This activation leads to an increase in calcium ions, ROS, and a molecule called cyclic AMP (cAMP).
- Increases cell proliferation rates, as well as energy in cells
- Mobilizes stored energy

WHAT MAKES IT DIFFERENT FROM A REGULAR LASER?



Red light therapy operates at specific wavelengths (typically in the range of **600-1000** nanometers), which are crucial for penetrating the skin's surface and interacting with the deeper tissues. This is different from regular lasers, which might operate at various wavelengths not optimized for therapeutic effects on the skin and underlying tissues.

The SanoPen's red light laser is designed to focus at wavelengths between 650nm-950nm, highly increasing the efficiency that it carries the process out. penetrate deeper into the skin than ordinary lasers.



"The Sanopen, a groundbreaking and largely unexplored technological marvel, holds incredible potential to revolutionize the medical landscape as we know it." - **Dr. Sam Kim, Dr. in Chemistry from the University of Toronto, Olympiads School**

VII. FINANCES

| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 |
|--------------------|------------------------------|---------------------------------|---------------------------------|-------------------------------|------------------------------|
| Development | \$50,000 | N/A | N/A | N/A | N/A |
| Testing | \$130,000 | N/A | N/A | N/A | N/A |
| Marketing | \$ 200,000 | \$250,000 | \$300,000 | \$350,000 | \$450,000 |
| Manufacturing | \$1,280,000 = 40,000 pens | \$1,664,000 = 52,000 pens | \$2,240,000 = 70,000 pens | \$3,200,000 = 100,000 pens | \$4,320,000 =135,000 pens |
| Operating Expenses | \$500,000 | \$750,000 | \$900,000 | \$1,150,000 | \$1,300,000 |
| Buffer | N/A | \$100,000 | \$150,000 | \$300,000 | \$450,000 |
| Sales Revenue | N/A | \$3,560,000 = 40000 pens | \$4,628,000= 52000 pens | \$6,230,000 = 70000 pens | \$8,900,000=10 0,000 pens |
| Gross Profit | N/A | \$2,280,000 | \$2,964,000 | \$3,990,000 | \$5,700,000 |
| Net Income | N/A | \$1,180,000 | \$1,614,000 | \$2,190,000 | \$3,500,000 |

**WE ARE ASKING FOR
\$2.160,000 FOR 20%
EQUITY IN OUR
COMPANY.**

This will get us through the first year, as well as the first quarter for the second year.

Cost Breakdown of Manufacturing

| | |
|-------------------------|---------|
| Total Cost | \$32.00 |
| 4 Lenses, 2 Mirrors | \$5.07 |
| Light Source/Flash lamp | \$2.57 |
| Battery | \$3.23 |
| Computer Components | \$10.74 |
| Display | \$4.60 |
| Charging Components | \$5.23 |
| Synthetic Ruby Rod | \$0.56 |

VI. CONCLUSION

Sanopen's compact pen-sized design harnesses low-level laser therapy for accelerated cellular healing, increased oxygen flow, and enhanced ATP production, providing portable, cost-effective advanced wound care to reduce global healthcare disparities.

Problems It Addresses

- Scarring
 - By decreasing the time it takes a wound to heal, we can reduce the 94% chance of scarring down to 30%.
- Infection
 - We are able to reduce the infection rates from 25% down to 12%, effectively preventing over half of the infection cases.
- Chronic Diseases
 - We can save the population \$46 billion by addressing chronic wounds, by cutting down on hospital bills.
- Accessibility
 - We are able to increase accessibility for red light laser therapy by over 15x

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