

MedSafe™

Medication Dispensing System

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MedSafe™ Business Plan

9-25-24

Executive Summary

MedSafe™ is a patented safe and secure system for the distribution of patient medication for the prevention and treatment of addiction. Medication is sent to the patient in a locked tamperproof dispenser, preprogrammed with the doctors’ prescribed instructions for safe controlled delivery to the patient.

**JEC, U.S. Congress Joint Economic Committee, Analysis Finds Opioid Epidemic Cost U.S. Nearly $1.5 Trillion in 2020**

***Pandemic disruptions contributed to increased opioid use, highest-ever number of opioid fatalities, 80,926 in 2021***

MedSafe addresses the main drivers of the opioid crisis.

**Prevention:** Will prevent the misuse of addictive medications by controlling the dispensing to the prescribed dose, time and person.

**Compliance:** Will ensure the patient takes their medication at the correct time while monitoring compliance.

**Recovery:** Verification of compliance to the caregiver that harm reduction medication was taken by the patient.

Mission

To prevent the misuse of addictive drugs and keep addictive medications off the streets.

Concept

Medication is dispensed to the patient by the pharmacy in a locked, tamperproof, traceable container; which can only be opened by a licensed pharmacist. The locked container is either picked up at the pharmacy or delivered to the patient. The locked container is taken home and installed into a table top control unit that displays the prescription and dispensing information. The controller will alert the patient when the medication is available as prescribed. The patient will use either, fingerprint, facial recognition or a code to dispense the medication. The patient **Does Not** have access to the medication, except as prescribed.

Background

The CDC has identified three waves of the opioid epidemic, beginning with deaths involving prescription opioids, followed by increases in heroin, and finally synthetic opioids or fentanyl. The years 1999 to 2006 saw 10 percent annual increases in overdose deaths, slowing to an increase of 3 percent per year from 2006 through 2014, followed by a jump to 16 percent annually from 2014 through 2017. The first wave of the opioid epidemic was with the introduction of OxyContin onto the market in 1996. OxyContin, a long-acting opioid generically prescribed as oxycodone, was promoted as a medication capable of relieving pain for up to 12 hours and was labeled as nonaddictive. (*bipartisanpolicy.org 7*) The American Pain Society sought to enhance the treatment of pain during this same time period. In 2001, the Joint Commission on Healthcare Organizations issued new pain-management standards. Opioid prescribing rates increased sharply. In 2009, primary care physicians prescribed the majority of opioids. The combination of a highly addictive drug’s introduction to the market, an emphasis on addressing pain, aggressive marketing, and over prescribing, as well as a lack of evidence-based treatment availability and training in addiction, laid the groundwork for the opioid epidemic. In 2016, President Barack Obama signed into law two significant pieces of legislation to address the epidemic, the Comprehensive Addiction and Recovery Act (CARA) in 2016 and the 21st Century Cures Act (the Cures Act) also in 2016. These two laws, taken together, authorized over $1 billion in funding to curb the opioid epidemic. *(Tracking Federal funding to Combat the Opioid Chris, March 2019 Bipartisan Policy Center)*

Statistics

*National center for drug statistics, NCDAS*

1. More Americans have died from opioid overdoses than have died in WW2, the Vietnam War, the Korean War and the Afghanistan War, combined.
2. 80,000 deaths from opioid overdoses each year
3. 10M people abuse opioids each year
4. 72% of all overdoses are attributed to opioids
5. Overdose deaths increased 500% from 1999 to 2019
6. 3.1M people abused opioids last month, 100,000/day
7. 92% of opioid abusers used prescription opioids at least once last year
8. 11% of all opioid deaths were between the ages of 15 and 24
9. Pharmacies currently fill 153 million opioid prescriptions per year.
10. Prescription opioid abuse cost $78.5B annually in the form of healthcare, legal programs, and lost productivity

Government Policy

Opioid addiction alone has a direct effect on 5% of the United States GDP. With a $1.5T effect as it relates to health care, legal and lost productivity on the US economy**.**  **(JEC, U.S. Congress Joint Economic Committee, Analysis Finds Opioid Epidemic Cost U.S. Nearly $1.5T, 2020) (US GDP $29T,2020)**

(2023) Federal, state and local governments have increased investments in drug treatment and prevention programs. The President has emphasized harm reduction and called for a whole of government approach to beating the overdose epidemic as part of his Unity Agenda. The White House announced it was awarding $1.5 billion to all states and territories to address the epidemic, which is in addition to the nearly $5.5 billion provided by the American Rescue Plan Act and other Biden Administration actions in 2021 to fund treatment programs across states and territories.

In 2010, the Affordable care act (Obamacare) was passed. One of the 10 essential health benefits is substance abuse treatment. All plans must cover substance use disorder and cannot charge more for pre-existing conditions. In addition, insurance companies cannot put a yearly or lifetime limit on substance use disorder services.

National Opioid Settlement

We have added this section to demonstrate the far-reaching impact that the opioid crisis has had on some of the nation’s largest corporations. Mistakes were made at every level and have impacted the lives of millions of people. These companies have been held libel for their mistakes and omissions. It is easy to see how MedSafe can address the current problem, and prevent a crisis of this magnitude from every happening again. Any and all of these companies would benefit greatly from the patented MedSafe technology.

In 2021, nationwide settlements were reached to resolve all opioids litigation brought by states and local political subdivisions against the three largest pharmaceutical distributors, McKesson, Cardinal Health, and AmerisourceBergen (“Distributors”) and against manufacturer Janssen Pharmaceuticals, Inc. and its parent company Johnson & Johnson (collectively, “J&J”). These National Settlements have been finalized, and payments have already begun. In all, the Distributors will pay up to $21 billion over 18 years, and J&J will pay up to an additional $5 billion over no more than nine years.

In 2022, agreements were announced with three pharmacy chains—CVS, Walgreens, and Walmart—and two additional manufacturers—Allergan and Teva. In January 2023, each of those pharmacy chains and manufacturers confirmed that a sufficient number of states had agreed to the settlements to move forward. The 2022 National Settlements have now all been finalized.

National Settlements require:

* Teva to pay up to $3.34 billion over 13 years and to provide either $1.2 billion of its generic version of the drug Narcan over 10 years or $240 million of cash in lieu of product, as each state may elect;
* Allergan to pay up to $2.02 billion over 7 years;
* CVS to pay up to $4.90 billion over 10 years;
* Walgreens to pay up to $5.52 billion over 15 years; and
* Walmart to pay up to $2.74 billion in 2023, and all payments to be made within 6 years.
* The Distributors will create a groundbreaking clearinghouse through which they will be required to account not only for their own shipments, but also the shipments of the other distributors, in order to detect, stop, and report suspicious opioids orders
* Teva and Allergan have agreed to strict limitations on their marketing, promotion, sale, and distribution of opioids, including a ban on: (1) promotion and lobbying; (2) rewarding or disciplining employees based on volume of opioid sales; and (3) funding or grants to third parties
* Walmart, CVS, and Walgreens are required to implement changes in how they handle opioids, including requirements addressing their compliance structures, pharmacist judgment, diversion prevention, suspicious order monitoring, and reporting on red-flag processes, as well as blocked and potentially problematic prescribers.

MedSafe Market Drivers

PREVENTION: Of those who began abusing opioids, 75 percent reported that their first opioid was a prescription drug. Nearly 80 percent of heroin users reported using prescription opioids prior to heroin. Someone once said “an ounce of prevention is worth a pound of cure”, nowhere is this more applicable. If you remove the source or the opportunity, you are much less likely to start down the path of addiction. This goes for any addiction, but especially opioids. The trick is to not only to prevent unauthorized use of the medication, but to also prevent the misuse of the medication while allowing the maximum therapeutic effect. There will always be people who will want more, but by controlling the time between dosses, the ability to abuse the medication is greatly reduced. This should facilitate a discussion with the patient’s physician to better address the problem, rather than self-medicating. This puts the physician back in control of the medication, but more importantly, how and where it is used.

With pharmacies still filling 153 million legal opioid prescriptions each year, it stands to reason that a much better way of controlling opioid distribution is required, if there is to be any chance of addressing the opioid addiction crisis. Prevention is much less expensive than treatment.

The stake holders in prevention are not just the families who have lost or who are losing their loved ones to addiction, but the entire industry, from Insurance companies, governments, pharmacies, drug companies, physicians; with the real losers being the patients.

COMPLIANCE: One of the main drivers for opioid prescriptions is tapering. Tapering allows the gradual reduction of opioid strength over time, allowing a gradual reduction of dependence, with the option of transitioning to a non-addictive prescription over time. Without a program designed around compliance and tapering, addiction has a much easier time taking hold.

“Drug Relate Problems” (DRP) is another aspect of compliance that drives a $131B market. DRP accounts for 17 million ER visits and 8.7 million hospital admissions per year. Of the total, 44% or $57.6B can be attributed to non-compliance. This comes in the form of skipping medication, taking the wrong medication, taking medication at the wrong time, or simply running out of medication. *(NIH, Drug-related hospital admissions, a systematic review,2019) (PMC6911719, PMID 31857995)*

The pharmaceutical industry is the most regulated, scrutinized, and controlled industry in the world. From development to delivery, no industry has more oversight over the process of bringing its product to consumers. It is ironic that with all the controls put in place to bring their products to market, the last step is completely reliant on the ability of the consumer to follow the printed instructions on the side of the bottle and somehow keep it from falling into the wrong hands. The stakeholders for prescription compliance are the same as for prevention. The insurance companies, pharmacies, and government agencies bear the cost of non-compliance.

TREATMENT: The substance abuse treatment industry was $37.14B in 2022 and is projected to grow to $60B by 2029. (Pharmaceutical/U.S. substance use disorder treatment market Report ID: FBI107172). On average, outpatient drug rehab costs $8,386/yr, with inpatient drug rehab costing $50,469/yr. With a relapse rate of 56% for outpatient treatment and 45% for inpatient treatment, overall success in long-term sobriety is not much better than a coin toss. (NIH, PMC9579533)

The main treatment driver for substance abuse programs, both inpatient and outpatient, is harm reduction medication.

**Opioid Use Disorder (OUD) and Withdrawal:**

1. **Methadone**: Reduces withdrawal symptoms and cravings.
2. **Buprenorphine** (Suboxone): Reduces withdrawal symptoms and cravings.
3. **Naloxone** (Narcan): Reverses opioid overdose.

A Swedish study compared patients maintained on 16 mg of buprenorphine daily to a control group that received buprenorphine for detoxification (6 days) followed by a placebo.[25](https://nida.nih.gov/node/21340) All patients received psychosocial support. In this study, the treatment failure rate for placebo was 100 percent vs. 25 percent for buprenorphine. (Source: Kakko et al.,2003) (NIH, National Institute on Drug Abuse)

Patients on methadone had 33 percent fewer opioid-positive drug tests and were 4.44 times more likely to stay in treatment compared to controls.[12](https://nida.nih.gov/node/21340) Methadone treatment significantly improves outcomes, even when provided in the absence of regular counseling services;[18,19,21](https://nida.nih.gov/node/21340) long-term (beyond 6 months) outcomes are better in groups receiving methadone, regardless of the frequency of counseling received.[22,23](https://nida.nih.gov/node/21340) (NIH, National Institute on Drug Abuse)

Long-term sobriety requires long-term care. There are many factors associated with relapse, but without a cost-effective long-term treatment plan in place, on a national level, long-term gains in the fight against opioid addiction are simply not possible.

The stakeholders for long-term treatment are insurance companies, government agencies, and patients trying to live their lives under the cloud of addiction.

The MedSafe™ Solution

PREVENTION: MedSafe™ addresses the problem of available opioids to both the patient and the immediate members of the household, by locking the medication in a safe tamperproof delivery device. The MedSafe is delivered to the patient preloaded with the doctor’s prescription and instructions for dispensing to the patient. The patient will set up the MedSafe to recognize, a fingerprint, photo-recognition, or numeric code. Once the device is set up, there is no need to do it again. The device will notify the patient with a gentle sound and light that it is time to take the medication. It can also send a message to the patient’s cell phone, or a supervising caregiver for monitoring.

If the prescription is set up for “as needed”, the device will flash a green light that tells the patient that their medication is available if they need it. An additional feature is the ability to send the user information to cloud servers, allowing the doctor or medical professional the ability to see how and when the patient is taking the medication and make adjustments to the delivery window if needed.

COMPLIANCE: Compliance is a key component of the MedSafe™ system. Patient monitoring by the doctor or medical professional is a key feature, with the added advantage of adding a personal caregiver to help monitor compliance. Another key feature adds tapering to compliance. The unique single-cell delivery system has the advantage of adjusting the dose of the medication or even switching to a different medication over time, without bringing the system back to the pharmacy. For example: the first 6 delivered pills could be 10mg each, the next 10 could be 5mg each and the next 20 could be a completely different medication. The patient has no choice but to follow the doctor’s prescription. This is a powerful tool in the fight against addiction.

TREATMENT: MedSafe™ combines all the features of prevention, compliance and tapering and adds the component of “Checking In”. Checking in allows the patient the flexibility to connect with an addiction counselor, doctor, nurse, or a combination of addiction professionals who can monitor, control medication, and stay relevant to the patient’s long-term care, at a fraction of the cost of inpatient or even outpatient care. With 100% of patients relapsing after detox who were given psychosocial support but no harm-reducing medication, a more holistic support system is needed for long-term sobriety. In addition, since the medication is locked away, it cannot find its way into the subculture of buying and selling addiction medication.

Marketing

1. Marketing will take a direct approach to enlist the major stakeholders in the opioid epidemic. MedSafe will aggressively peruse government grants and enlist the Congressional Representees who have championed addiction legislation. The US department of Health and Human Services is distributing $47.8M in Grant Funding for Programs Expanding Access to Medications for Opioid Use Disorder, Addressing Other Facets of Opioid addictions (July 19, 2023)
2. A strong market for prevention, compliance and treatment are HMO insurance companies and service providers. These companies are mandated through the Affordable Care Act to supply addiction treatment as a core benefit. Prevention is much cheaper to implement than treatment, especially given a less than 50% long term success rate; with no lifetime financial cap on treatment. Treatment with a locked medication system tied to a virtual daily check-in, is a cost-effective approach to long term care.
3. MedSafe is uniquely qualified for distribution of medication through the mail. Not only is it a much safer why to distribute medication through an uncontrolled supply chain, the ability to group and dispense medication as prescribed will significantly increase compliance and reduce confusion and misuse. This is especially true for older patients on multiple medications with different delivery intervals. With Amazon delivering medication to your door, it is only time before, Walgreens, Walmart and CVS following suit.

Revenue

There are two main components to the MedSafe system. The MedSafe is a standalone, self-powered, 3G connected system. It is a locked system, only available for filling by a licensed Pharmacist. The second part of the system is a pharmacy filling device allowing the medication to be installed in the MedSafe. There are multiple options for MedSafe revenues:

**Revenue Options**

* 1. The MedSafe will be leased to the dispensing Pharmacy for a monthly fee. This fee will include the device, software support, and repair. This will greatly reduce the barrier to entry for the Pharmacy and generate a secondary revenue stream in the way of a small rental fee to the patient and/or the insurance company. This will initially require the company to cover the cost of production, but guarantee an on-going revenue stream well after the cost of the device has been paid for.
  2. The pharmacy filling device can follow a similar lease/rent option. This would be a much higher monthly fee to cover software support, maintenance and amortization of the equipment.
  3. There is also the opportunity to charge a onetime license and setup fee per instillation. This would include training and support for each instillation.
  4. Another option would be to sell the devices to the pharmacy chain. This would require less upfront capital, as well as show a significant revenue increase in years 4-5. However, it could reduce market adoption, due to the significant up-front costs to the pharmacy.
  5. An additional revenue stream would involve the collection of de-identified data. This data is non-patient specific, meaning that no personal data is collected. Patient age, sex, weight and other non-patient identifying formation can be captured. When the patient is prompted to take their medication, they will be asked a few questions to help their doctor monitor their progress.
     1. How do you feel today 1-5
     2. How did you sleep 1-5
     3. How is your appetite 1-5
     4. How is your energy 1-5
     5. Other medication specific questions.

This information will be available to the doctor through a doctor portal. This daily ongoing patient feedback will contribute positively to the quality of their care.

The same information can be collected across multiple de-identified patients taking the same medication. This information is not only useful for patient and doctors, but invaluable to the pharmaceutical company who developed the drug. A subscription portal can be set up in software to collect this data, with the drug companies having paid access to this data.

De-identified drug data has the opportunity to generate significant revenue while tracking safety, efficacy and side effects for a specific medication.

* 1. Under the data collection scenario, MedSafe™ would be a valuable tool for new and ongoing clinical drug trials. Daily data collection with guaranteed compliance would streamline the data collection process while ensuring data integrity. Given the high cost of bringing a new drug to market, anything that can streamline the process and increase accuracy will be a welcome tool.
  2. As an FDA requirement, drug companies are required to conduct post-market follow-up on all drugs they manufacture. These are referred to as post market requirements (PMRs) and postmarket commitments (PMCs). The FDA requires drug manufacturers to conduct postmarket safety studies and clinical trials to assess possible serious risks associated with the drugs on a regular basis.

MedSafe™ is uniquely qualified to collect this data on an ongoing basis, with accurate direct patient input at no additional cost to the company.

See Appendix A for Financial Projections

Intellectual Property

David J Sanso and David W Sanso have received a method and device patent covering the MedSafe system. Additional device patents covering alternate delivery systems and methods are in process.

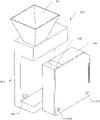
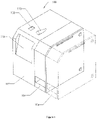
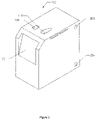
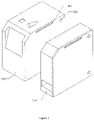
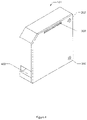
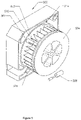
US11348399B1

Method Patent: Priority Date: 2019

MedSafe medication dispensing and monitoring system

A medication storage and dispensing system that includes a plurality of cavities that can be used to securely store and dispense pills and other medications in a secure, traceable and controlled environment. The system allows for the secure transport and dispensing, while allowing the tracking of inventory. The system provides reminders of when the medication should be taken.

Images (14)

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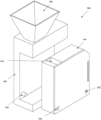
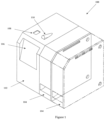
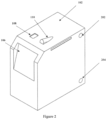
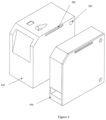
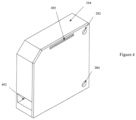
MedSafe medication dispensing and monitoring system

Device Patent

Abstract

A medication storage and dispensing system that includes a plurality of cavities that can be used to securely store and dispense pills and other medications in a secure, traceable and controlled environment. The system allows for the secure transport and dispensing, while allowing the tracking of inventory. The system provides reminders of when the medication should be taken.

Images (13)

Competition

Hero Health

Hero Health is a subscription medication reminder and delivery system. Medication is received in standard medication bottles from the pharmacy. The patient, or care giver is responsible for loading the medication in the Hero system and manually programing the delivery interval. The system also includes a cell phone app to remind the patient when it is time to take their medication. A 12-month subscription is $360 and a 36month subscription is $1079. Hero Health also includes phone technical support to address loading and programing questions. This level of subscription is not covered by Medicare. Hero claims that physicians can use RTM (Remote Therapeutic Monitoring) codes to submit to Medicare for payment. There is no reimbursement to the patient. Patent# US20230000724A1

MedaCube

MedaCube is a medication reminder and delivery system. It holds up to 16 different medications. The patient, or care giver is responsible for loading the medication in the MedaCube system and manually programing the delivery interval. The system will send text and email notifications to caregivers if medications are late or have not been taken. Cloud storage of prescribed schedule, history, missed dose reporting, contact information and pill image reference data is available. One time cost of $1800, no subscription available. The patents are licensed to MedaCube by the University of Rochester School of Medicine. Patent # US10360751B2 & W02018031724A1

CompuMed

CompuMed e-pill is a medication reminder and delivery system. CompuMed automatically dispenses medication up to four times per day from a tamper resistant weekly medication cassette into a drawer.   An adjustable audio alarm with a medication message (“Take with food”) appears on the screen. The system does not require the patient to ask for the medication, it is available in a small draw to be taken when the patient decides to take it. One time coat $950, no subscription available.

E-Pill Station is a less expensive ($425) version of the E-pill system designed as simpler consumer reminder and dispensing system. Patent # 9,198,834 & 9,539,177

Design and Development

With over 40 years of medical design and development experience, David W Sanso is uniquely qualified to lead the team of highly motivated engineers, software developers and regulatory personals to bring MedSafe to market in under 30 months. Development will be done to the IEC13485 and IEC62304 medical standard for software and hardware development. MedSafe will be marketed as an FDA class 2 device requiring regulatory oversight during the entire development process. Development will be separated into three phases, X1, X2, X3.

X1 starts with a focus group with the representative stake holders. This establishes the basic requirements and some of the technical specifications. Input from Engineering, Marketing, Regulatory and Clinical come together to establish the “Inputs”. At the end of X1, a design review is held to determine if the “Outputs” match the “inputs” from the start of the X1 phase. Any requirements that haven’t been met, become “inputs” for the X2 Phase. A working prototype will demonstrate basic functionality.

X2 picks up where X1 leaves off. The X1 design review will weed out problems and weaknesses in the system as well as any regulatory hurdles that need to be addressed. We would also expect to receive marketing/customer input based on a working prototype. This phase of development includes more regulatory involvement, including risk analysis, preliminary IEC60601-1-2 safety testing and IEC62304 software review. The output from the X2 design review phase will include a functioning system, documentation, regulatory review and the resolution of all X1 requirements.

X3 is the preproduction phase. The product is designed and ready for tooling design and final documentation. X3 includes the completion of all safety and software testing as well as all regulatory submissions and official audits. Preproduction documentation is checked and revised to production level. This also includes customer testing and feedback. The output from the X3 design review is a production ready design ready for manufacturing.

The MedSafe system includes two main components, the MedSafe medication dispenser that the patient uses and the pharmacy filling station that places the medication in the MedSafe. Both systems require all three phases of development and testing. This will require two teams working closely in parallel to meet the development deadline. These are considered Class 2 devices by the FDA.

Regulatory Classification

|  |  |
| --- | --- |
| **Device** | medication management system, remote |
|  | Remote Medication Management System. |
| **Definition** | A remote medication management system provides a means for the patient's prescribed medications to be stored in a delivery unit; For a medical provider to remotely schedule the patient's prescribed medications; To provide notification to the patient when the prescribed medications are due to be taken; To release the prescribed medications to a tray of the delivery unit accessible to the patient on the patient's command; And to provide to the medical provider a history of the event. The system is intended for use as an aid to medical providers in managing therapeutic regimens for patients in the home or clinic. |
| **Physical State** | A remote medication management system consists of three primary components: control software (clinical and communications software), the medication delivery unit, and a specialized blister package containing the patient's prescribed medications that the patient receives from a pharmacy and stores in the medication delivery unit. |
| **Technical Method** | A clinician using the clinical software enters the patient's prescribed medication schedule. The patient goes to a pharmacy and receives the prescription packaged in one or more blister pack discs. The medication delivery unit then dispenses the medication at the quantities and schedule that were prescribed by the clinician. |
| **Target Area** | Intended for delivery of pill type medication. |
| **Regulation Medical Specialty** | General Hospital |
| **Review Panel** | General Hospital |
| **Product Code** | NZH |
| **Premarket Review** | [Office of Gastrorenal, ObGyn, General Hospital, and Urology Devices](https://www.fda.gov/about-fda/cdrh-offices/cdrh-management-directory-organization#OHT3) (OHT3) Drug Delivery and General Hospital Devices, and Human Factors (DHT3C) |
| **Submission Type** | 510(k) |
| **Regulation Number** | [880.6315](https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/cfrsearch.cfm?fr=880.6315) |
| **Device Class** | 2 |
| **Total Product Life Cycle (TPLC)** | [TPLC Product Code Report](https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfTPLC/tplc.cfm?id=2878) |
| **GMP Exempt?** | No |
| **Summary Malfunction Reporting** | Ineligible |
| **Implanted Device?** | No |
| **Life-Sustain/Support Device?** | No |

Executive Team

President/CEO David W. Sanso (Appendix B)

CFO Open Position

Director Regulatory Affairs Open Position

Director of Marketing Open Position

Director Governmental Affairs Open Position

Director IT David J Sanso

Director of Medical Affairs Open Position

Director of Engineering Open Position

Director HR Open Position

Appendix B

David W Sanso

An innovative business leader with a strong design, development and regulatory background in medical endoscopy, disposable micro imaging devices, camera development and catheter design. Over 35 years of Chinese manufacturing experience in plastics, electronics and mechanical assembly. Holder of 20 US and foreign patents in the fields of medicine, engineering and consumer products. Managed operations and production of medical Xenon power supplies in the US and China.

Professional Experience

**BioVision Technologies LLC**

2003-2020

**President/CEO**

Established 2003 as a subsidiary of Carsan Engineering. Develop and market medical imaging products for the human medical market. Developed proprietary medical technology for the production of disposable fiberoptic micro endoscopes, disposable epidural catheters and HD endoscopic camera systems. Supplier to Zimmer/Biomet and Lutronic Corp. for endoscopic camera systems, disposable endoscopes and epidural catheters for pain management and in-office TMJ procedures.

**Carsan Engineering Inc.**

1986-2012

**President/CEO**

Carsan Engineering was founded in 1986. Carsan’s primary focus was the design, development and sales of Xenon power supplies for use in medical fiberoptic imaging. Customers included, Stryker endoscopy, Karl Storz, Linvitec, Luxtec, Fujikura, Olympus and other smaller manufactures. Carsan was the number one supplier of Xenon power supplies to the dental and medical market from 1995-2005. In both 1999 and 2000, Carsan was honored on the INC 500 list as one of the 500 fastest growing companies in the country. Through outsourcing manufacturing to China and controlling the quality in the US, Carsan was able strike a balance between price, reliability and supply, to bring maximum value to its customers and shareholders. In 2013, Carsan was sold to Excelitas, a manufacture of Xenon lamps.