BedLab, LLC, a Georgia startup company, is developing comprehensive yet cost-effective specialized beds to prevent and treat immobility-induced complications in hospitals, nursing homes, and house-bound patients. With the participation and design input of leading physicians and healthcare practitioners, Bedlab already has developed one breakthrough solution – the DynaMax bed shown below and is developing a derivative economical preventative solution – the PreventaBed. One United States patent already has been issued, and seven more national and international patent applications are pending.

**Dynamic Therapy**

- With exclusive DynaHolder capability, securely **cradles and retains** the patient to allow side-to-side rotation (unilaterally and bilaterally) without uncomfortable restraints.
- Used for pressure-ulcer prevention or treatment.
- Used for prevention and treatment of pulmonary complications.
- Allows the patient to eat and read in a comfortable, normal seated position up to a 90-degree elevation (note: currently marketed solutions allow up to 30-degree elevation and after that needs nursing manual operation).
- Provides mobility for up to 1000 pounds obese patients.

**The Problem**

Every year, the treatment of immobility-related problems – including pressure ulcers (bedsores) and pulmonary complications – costs the United States healthcare industry as much as $9.2 to 15.6 billion dollars. With Medicare expenditures projected at $486 billion in 2009, the impact of pressure ulcers on the healthcare system has required changes in the healthcare policy. To prevent such complications, the
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currently accepted but infrequently implemented standard of practice is to move at least every two hours a patient’s body, torso, and limbs. In many healthcare facilities, staff is trained to rotate manually patients 24/7 on a difficult to maintain routine schedule. A few facilities add expensive pneumatic-pulsating mattresses, often costing $3,000 or more, to standard hospital beds; however, these solutions also require nurses’ manual repositioning of the patients. More often than not, preventative procedures and technologies are used only sparingly or inadequately and these “preventative” solutions are the ones that result in about 500,000 U.S. patients developing new pressure ulcers each year. Several hundred thousand more develop other immobility-related pulmonary complications.

The Market

The relevant market is clearly defined. There are about 2.8 million hospital and nursing-home beds in the United States alone. Europe, Canada, and Japan have about 6 million more. Already, the market for “therapeutic surfaces” in the States is estimated at more than $2 billion/year.

The elderly market, also, is experiencing a high growth rate. The fastest growing segment of the population is the elderly. In 2008 Medicare, Medicaid, and several private insurance companies notified healthcare providers that they would no longer pay for “preventable events,” such as pressure ulcers. That change in policy puts the administrative, economical, and legal burden onto the health organizations.

Given estimates that treating a pressure ulcer cost as much as 200 times more than preventing one, the market is set to explode.

Countries where we aim to file patents are: USA, UK, France, Germany, Canada, Israel, Australia, India and Japan.
BedLab's Filed Patents

<table>
<thead>
<tr>
<th>Product/Feature</th>
<th>Prototype Tested</th>
<th>USA &amp; Intl. filed</th>
<th>Date Filed</th>
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<tr>
<td>Movement Control Software</td>
<td>Partially</td>
<td>DDP Filed 12/06/06 Patent will be done 2010</td>
<td></td>
</tr>
<tr>
<td>DynaRail</td>
<td>Yes</td>
<td>Regular Patent No. 12/176,338 PCT Filed No. 2005.007PCT</td>
<td>7/18/08</td>
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<td>DynaProner</td>
<td>Yes</td>
<td>Provisional Patent Filed 3rd quarter 2009</td>
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</tbody>
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The Solution

Our multi-positional beds use a revolutionary cost-effective design to provide a wide range of timed, computer-controlled programmed movements of a patient’s body. The design’s efficacy is illustrated by the fact that BedLab’s technology has been nominated for an award for engineering innovation applied to health by the “Tech Museum of Innovation.”

BedLab’s technology builds on and significantly enhances a proven specialty bed developed by several engineers in an academic setting in Buenos Aires, Argentina. Such bed won a prize for the best engineering technology in the year 1997. Several units of this university model (featured in a 2004 “Discovery Channel” special) were constructed and used in hospitals in Buenos Aires. Favorable reports from physicians, nursing staff, and patients attest that the basic design is successfully used in...
practice to prevent and treat pressure ulcers while offering superior comfort. The University environment in Buenos Aires was not conducive to continue development and introduce of an improved technology into the international market. Therefore, one of the engineers resigned from the university and with R. W. Ferraresi, created BedLab LLC. Later Mario Eleonori, a mechanical engineer, joined the company. In 2006, Bedlab LLC was incorporated in the state of Georgia.

The core of BedLab’s revolutionary improvements is a four-to-six-point adjustable patient support framework, mounted over an articulating base. The design is both cost effective (minimizing the number of engines and moving parts) and enabling a versatile range of programmable movements, with no failures, despite the “normal” hospital transportation of patients through elevators etc; of note, air pumps are not used with this technology.

A few of the bed’s movements are illustrated below:

### Dynamic Prone Rotation with DynaHolder

- Places patient in the prone (face down) position to help drain the lungs in patients with pulmonary complications.
- Rotates the patient side to side, unilaterally or bilaterally, as much as ~90 degrees each side.
- Eliminates the need for patient restraint in most cases.
- Assists in prevention or treatment of:
  - Pulmonary complications
  - Acute Respiratory Distress Syndrome (ARDS)
  - Cystic fibroses
  - Chronic obstructive pulmonary disease
- Provides these capabilities to a wide range of patients, including those who are obese.
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The PreventaBed will be targeted for the prevention and treatment of pressure ulceration and pulmonary complications and other complications generated by patient’s immobility.

The basic PreventaBed will have all of the above examples of mobility, it will be substantially more cost effective (depending on model priced at US $10-15K) than currently marketed managed-air-mediated specialty beds, but also will be more reliable because air mediated solutions have a downtime of about 30%. BedLab plans initially to introduce the PreventaBed in patients with the most serious medical situations, i.e. in the paralytic (including quadriplegic) and in nursing homes with the highest incidence of patient’s ulcerations.

Eventually, PreventaBed will be used as a replacement for the standard hospital or nursing-home beds, for newly admitted patients. The PreventaBed will be aimed at patients of up to 350 Pounds. A new model based on the same technology but with different dimensions and materials will be developed to provide programmed mobility to the obese patient (to be named PreventaMax) with a capacity to manage patients of up to 1000 pounds.

The Investment Potential

Bedlab is seeking investments to advance the development of its beds, secure broad United States and international patent protection, begin production for the first model (PreventaBed) to be introduced in Argentina and the US, and eventually license its technology to a major medical-device company. Bedlab projects that it will achieve rapid and wide penetration into the United States and Canadian markets by year five.

www.bedlab.com
Bedlab projects that a dollar invested today could yield a greater-than 100% annualized return over five years.

References

• US Census Bureau.
• National Specialized Beds Study, Department of Veterans Affairs, Feb. 1992.
• “Wound Repair and Regeneration: Guidelines for the treatment of pressure ulcers.” JoAnne Whitney, RN, PhD1,2; Linda Phillips, MD1,3; Rummana Aslam, MD4; Adrian Barbul, MD4,5Finn Gottrup, MD, DMSci6; Lisa Gould, MD, PhD3; Martin C. Robson, MD7; George Rodeheaver, PhD8; David Thomas, MD9; Nancy Stotts, RN, EdD10
• Baranonski, Sharon, RN, APN, CWOCN, MSN, FAAN. “A renewed awareness: All health care providers need to be involved in preventing and treating these problematic wounds.” Nursing 36 8 (2006): 36-42
BedLab’s Locations and Activities

BedLab has an office in the United States at 3450 River Club Drive, Cumming, Georgia 30041-2825. Dr. Rodolfo W. Ferraresi, president, manages the company’s affairs, including funding for research and development, generating an extensive intellectual-property portfolio, and engaging in license negotiations.

BedLab has an engineering laboratory in the city of Buenos Aires. Co-founders Eduardo R. Benzo and Mario Cesar Eleonori manage this facility, and suitably qualified staff members ably support them.

Website: www.bedlab.com (A new version is under construction and would be available in late February 2010).

Company Board of Advisors three Emeritus Professors

Robert J. Moffat, Ph. D. obtained an engineering degree (B.S.) at the University of Michigan. He worked for several years in the Gas Turbine Laboratory of the General Motors Research Laboratory, and went on to obtain a M.S. and Ph.D. in Mechanical Engineering from Stanford University. Since 1966 he has been on the faculty of Stanford University, being appointed Professor of Mechanical Engineering in 1972.

Dr. Moffat is a leading international authority on heat transfer--an important problem in large engines and turbines for earth-moving machines and airplanes--and microprocessor design. He also has extensive practical experience in the development of seals in gas turbines and thermocouples for point-wise temperature measurements. Dr. Moffat has been an invited lecturer for 40 years in the prestigious “Measurement in Engineering” series and for 10 years in the American Society for Mechanical Engineers Professional Development Program. Also, he has experience in medical engineering, especially the thermal protection of newborn infants and collaborated with Professor A. Hackel in the development of a portable incubator for transport of infants. This has been widely used, and Dr. Moffat was awarded the American Society for Mechanical Engineers Holley Medal in 1987. Major United States and international companies have appointed him as a consultant for a variety of different engineering projects.

Dr. Moffat has prepared courses at Stanford and elsewhere on electronics cooling, uncertainty analysis, experimental methods and problem solving. He has trained many engineers who hold important academic and industrial positions in the United States, Canada, Europe, and South America.

Dr. Moffat’s expertise and creativity will propel new improvements and innovations in BedLab’s groundbreaking technology. He is already engaged in improving some technical aspects of the bed, reducing the number of engines while maintaining the bed’s functionality.

Dr. Moffat can be reached at

Organization: Stanford School of Engineering
Title: Professor of Mechanical Engineering, Stanford University, Stanford, CA 94305
Phone: 650-799-5594 E-mail: rmoffat@stanford.edu

Alvin Hackel, M.D., FAAP received an A.B. and M.D. from Stanford University and is certified by the American Board of Anesthesiologists and the American Board of Pediatrics. His broad postdoctoral experience...
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training is in cardiac physiology and pathology, clinical cardiology, intensive care, pediatrics, and anesthesia. Most of his career has been in pediatric anesthesia at Stanford University Medical School, where he is now Emeritus (Active) Professor of Anesthesia.

While being an internationally recognized leader in his specialty, Dr. Hackel has a wide range of interests, including cardiac and pulmonary physiology, intensive care, and the interfacility transport of critically ill patients at local and regional levels. He is published on the regionalization of interfacility transport of critically ill patients and the pediatric preoperative anesthesia environment. Dr. Hackel and Robert Moffat, a Stanford professor of engineering, designed a unique system for the transport of neonates and one for the measurement of physiologic respiratory parameters during intensive care. In addition, with Andreas Paepcke, a Stanford senior research scientist in computer sciences, Dr. Hackel designed a system for the wireless transmission of electronic medical records. His knowledge of vascular physiology is invaluable in our design for the optimized, controlled movements of BedLab’s products for the prevention of pressure ulcers.

Dr. Hackel can be reached at
Organization: Stanford School of Medicine
Title: Professor of Anesthesia and Pediatrics (Emeritus, Active), Stanford School of Medicine, Stanford, CA 94305
Phone: 208-891-6811 (cell-preferred), 6507236307 (Medical Center office) E-mail hackel@stanford.edu

Founders’ Profiles

**Eduardo R. Benzo, Electronic Engineer**

Graduated as Electronic Engineer from the University of Buenos Aires, (UBA) Argentina, 1992.

Postgraduate studies in bioengineering at the University Favaloro, Buenos Aires, Argentina, 1999-2001.

Awarded two research scholarships, 1992 and 1996, by the University of Buenos Aires, Argentina.

Assistant professor and researcher in the Department of Technology and Industrial Design at UBA, involved in the development of several projects related to design and manufacture of prototypes and their commercialization in the area of medical equipment. UBA, Argentina 1996-2004.

Head of the team in charge of developing technology for the prevention and treatment of immobilized patients by the use of a mechanically movable, computer-controlled "Mecatronic Bed," patented in the United States, Europe and Brazil.

Awarded a prize by The Argentine Center for Engineering as co-inventor of the Mecatronic Bed: “Best Engineering Project, Year 1999.”

The “Discovery Channel” recognized the Mecatronic Bed as one of the more original projects in 2001; a film was made of the bed in action.

Technical director for the manufacturing of the “Mecatronic Bed” under license to Argentina (Ferplast S.A.), 1995.

Currently responsible for electronic and software components for products introduced into the local (Argentina) market.

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Named director of the “Instituto de Formación Técnica Superior 24” by the government of Buenos Aires, Argentina, 2004-Present.

Consultant for several mechanical and electronic projects in Buenos Aires, Argentina, 1996-present.

Cofounder of BedLab LLC, a United States company, 2005-present.

Awarded first prize in by the Petroleum Company Repsol-YPF, Argentina, for devising a method for assessing the composition of an oil emulsion by measurements of its capacitance; prizewinner selected among 26 competitors, December 2006.

Mario Cesar Eleonori, Electro-mechanical Engineer

Graduated, Electro-mechanical Engineer, University of Buenos Aires (UBA), Argentina, 1969.


Founder and company president[company name?], performing work under contracts in various areas of mechanical, electric, and construction projects at several sites through the city of Buenos Aires, 1976-1982.

Founder of Ferplast S.A., a company for metallurgic, electronic, and plastic products; source of funding, public auctions, 1982-present.

Areas of expertise: chassis development, development of models made of fiberglass, and engines for processing acrylics.

Development of furniture and bedding for comfort and hospital use.[dates? specific companies? or research entities?]

Founder of BedLab LLC, 2006.

Note: Buenos Aires is a beautiful European-style city. Walking through the downtown area it is difficult to find a street in which Eng. Mario Eleonori has not constructed something of note. We consider that if there is any situation that requires a mechanical solution, Mario Eleonori can find it (RWF). [to be included as part of summary?]

Rodolfo W. Ferraresi, MD

Medical Doctor 1957 University of Buenos Aires, Argentina.

Specialization in internal medicine, allergy and immunology.


Head of the Department of Immunology at the National Institute of Microbiology, Argentina. (1960-1966).
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National Institutes of Health Special Fellow and instructor in bacteriology and immunology, Stanford University, California (1966-1970).

Head and founder of the Department of Inflammation and Immunology, Syntex Corporation, Palo Alto, California (1970-1980).

Director of Clinical Research, Schering-Plough Corporation (SGP), New Jersey (1980-1994).


At all three of the last corporations, Dr. Ferraresi designed and supervised clinical trials of important therapeutics. At Schering-Plough this was Interferon Alpha, a new genetically engineered protein never previously administered to humans. The clinical trials required interactions with company managers and scientists, hospital administrators and staff, and regulatory authorities. It also involved dosage and route optimization and evaluation of clinical trials. This project was completed in the record time of two years (from the investigative-new-drug stage to new-drug-application approval).

Trials of other therapeutics were successfully supervised at Repligen and Biotechnology general.

Dr Ferraresi’s experience of interacting with corporate managers and hospital administrators and staff, as well as with regulatory authorities, will be useful in negotiating licensing contracts with corporate partners. They will also enable him to help partners in designing and conducting trials to show that BedLab and accessories meet the requirements for treating patients with immobility syndromes better than currently available competitors’ products.