Match Maker/ Rehabilitation/ 2 March 2022

Newndra Innovations Pvt Ltd

Product: JaipurBelt

Project: Sharmik-Sambal: Relieve the load, Retain the livelihood.

Website of the company: http://www.newndra.com

Founder: Ganesh Jangir

TechEx.in Case Manager: Pradnya Aradhye (pradnya@venturecenter.co.in)

TechEx.in is a Regional Tech Transfer Office supported by:

About the product

Case story

Name : Mani Ram,
Age : 38 years.

Profession: Construction worker

Got a jerk in the spine during daily work and ended loss of lively hood and life turned to worse.

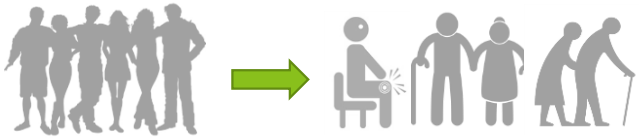
Pain-point: Lower back pain/ injuries

No. 1 Cause of work-related disability, lost productivity worldwide.

40% of Missed workdays is due Lower back pain(LBP)

The biggest cause of Health Care cost & Compensation.
(Costs Avg USD8000 /worker /year in USA)

8 out of 10 face lower back pain at some point of life.



Extremely vulnerable to musculoskeletal problems due to 15% lower mineral density & most diabatic population in the world.
Young India soon going to be biggest elderly population.

- https://www.quill.com/content/index/resource-center/workplace-safety/managing-workplace-fatigue/
- https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8645243/
- Hoy D, March L, Brooks P, et al The global burden of low back pain: estimates from the Global Burden of Disease 2010 study Annals of the Rheumatic Diseases Published Online First: 24 March 2014. doi: 10.1136/annrheumdis-2013-204428
- AAOS: American Associations of Orthopedic Surgeon. Global Bureau Diseases

Existing Solutions and Gap

Pain killer

- Merely suppression.
- Short term.
- Dangerous side effects.

Straps

- Not efficient.
- Hinder the mobility.
- Does not off load
- Increases the abdominal pressure.
- Sweating

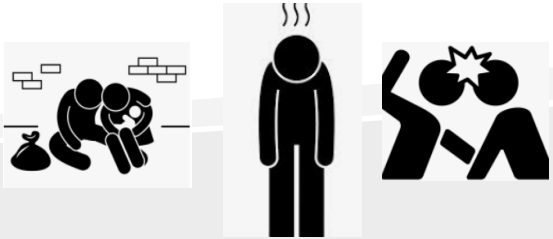
Bed-rest

- Not feasible for common men.
- Short term.
- Not reliable.
- Economically not a viable solution for the working people.

Surgery

- Too Expensive.
- Long recovery time.
- Too many precautions.
- Many a times, problem reappears.

Other side of this problem is ..



Solution

JaipurBelt™ assisting humans

newndra INNOVATIONS

Efficient
(shares up to 80% load)

Affordable
(Rs 14000, 10-20x lower than another exoskeleton, ~costs 1/2 of cost of painkillers and MRI, or 1/25th of surgery)

Lightweight
(1.8kg, ~bike helmet, cloths)

Self-powered
(no external power),

Fully Configurable, unhindered

Carbon Negative
(lower 30% carbon footprint by the user)

National Top Award for IP & Commercialization -2021

Hon'ble Piyush Goyal, Minister of Commerce and Industry, Govt of India, awarding Newndra Innovations in an online facilitation ceremony.

National Technology Startup Award-2020

Hon'ble Amitabh Kant, CEO of NITI Aayog, a public policy think tank, Govt of India, awarding Newndra Innovations in an online facilitation ceremony.

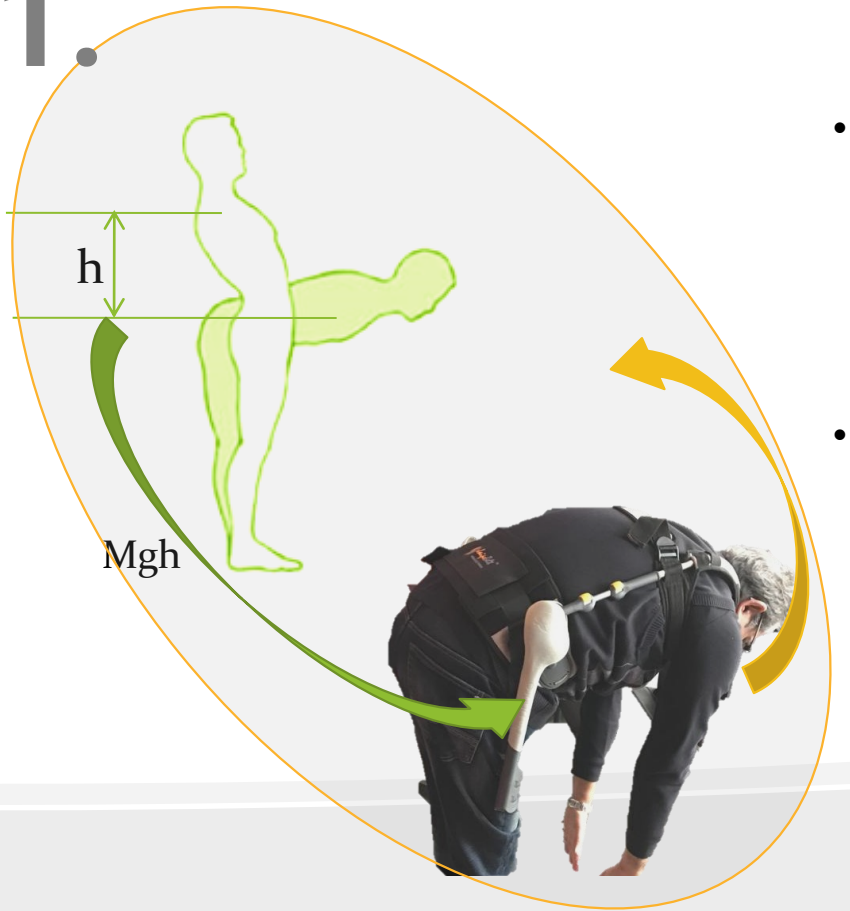
Top 10 Most promising Startup award by CII

Other recognitions and awards

- **Winner of National IP Award-2020 and National Technology Award 2020.**
- **Top 10** promising startups of the year, CII Industrial Innovations Awards.
- Awarded India Today Trail Blazer Awards 2016, **Top 10** in Smart50 by **IIMC.**
- **Top** Award in Tech4Raj 2017 by CIIE
- **Top five** in IMC Innovation Awards.

Uniqueness of JaipurBelt

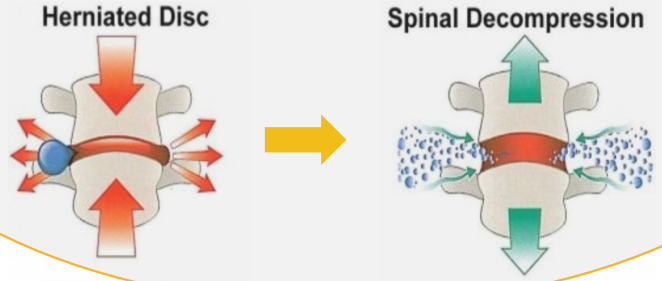
1.



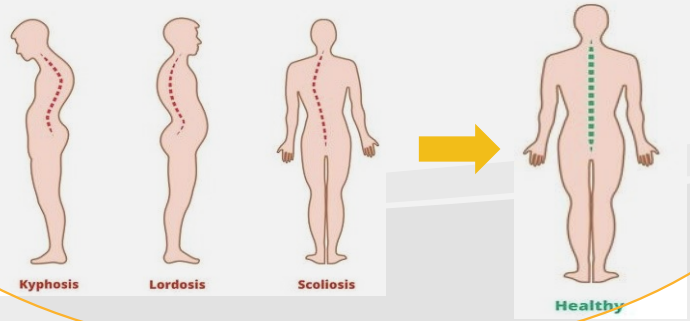
- **JaipurBelt store/conserves the gravitational potential energy when the user is bending down and use the same to assist the user during getting up.**
- **Provide physical adjustable support up to 20kg.**

Uniqueness of JaipurBelt

2. A reduction of pressure on and inside the discs (decompression) aids help reduce/ alleviate pain, slip disc, sciatic pain.



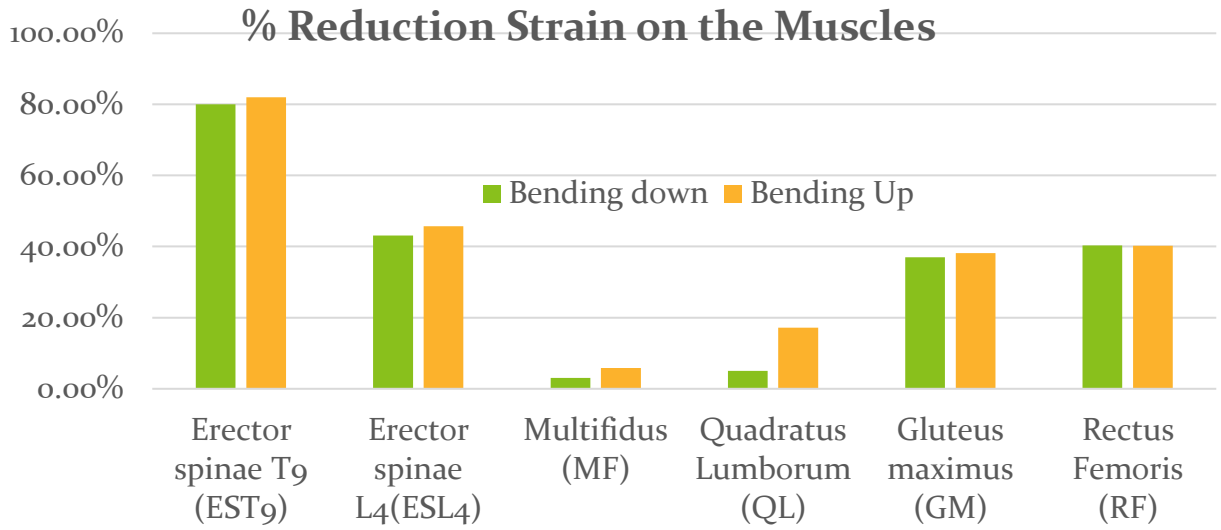
3. Ensures correct posture.



JaipurBelt reduces stress on various muscles while load lifting.

Muscle	Percentage decrease in stress After wearing JaipurBelt
Stoop Bending Down	
EST9	79.96%
ESL4	43.08%
MF	3.07%
QL	5.01%
GM	36.97%
RF	40.29%
Stoop Bending Up	
EST9	81.99%
ESL4	45.71%
MF	5.82 %
QL	17.14%
GM	38.12 %
RF	40.17 %

Validation with Ethical committee approved Clinical trial.



EMG Based Clinical Evaluation of Exoskeleton - JaipurBelt

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***Abstract*— This paper reports a clinical study to characterize reduction in load on the major muscles of the back and abdominals by use of JaipurBelt- an unpowered, lightweight, protective and therapeutic exoskeleton device that supports the spine and waist. One hundred subjects underwent Institutional Ethical Committee approved and CTRI registered clinical trial at Santokba Durlabhji Memorial Hospital (SDMH), Jaipur, India. The protocols used for this study incorporate without JaipurBelt without load (WOJBWOL), without JaipurBelt with load (WOJBWL), with JaipurBelt without load at a medium level of support (WJBMidWOL), with JaipurBelt with load at a medium level of support (WJBMidWL), with JaipurBelt with load at a maximum level of support (WJBMaxWL). The EMG was recorded from six major muscles. The overall reduction of muscle activity found 80.97% for Ninth Thoracic Vertebra of Erector Spine (EST9), 44.39%. for Forth Lumbar Vertebra of Erector Spine (ESL4), 24.62% for Multifidus (MF), 10.18% for Quadratus Lumborum (QL), 37.54% for Gluteus maximus (GM), 40.23% for Rectus Femoris (RF) after wearing the JaipurBelt at maximum support (WJBMaxWL) setting. In this clinical study, with the use of JaipurBelt, it was found that there is a substantial reduction in muscle force requirements for load lifting, frequent bending ups, bending down and stooping activities by reducing the load from back and abdominal muscles. Thus, use of JaipurBelt can potentially helps in reducing the risk of lower back disorders, fatigue, musculoskeletal problems, spinal disorders like slip disc and associated pain.**

Keywords— Exoskeletons, JaipurBelt, fatigue, Clinical trial, EMG, therapeutic device, lower back disorders

I. Introduction

Lower back pain, fatigue and musculoskeletal disorders are some of the common physical complaints of people around the globe, and these are the leading cause of work-related disability worldwide. Bending up and down, labour intensive tasks like lifting is the most common action of the human body. Bending up and down, manual handling tasks like lifting is one of the common activities that are present in most jobs and is most prevalent in the agriculture, construction, logistics and mining industries. These activities have been established as a risk factor for developing lower back disorders [1]. Almost one in 10 people (9.4%) worldwide suffers from lower back pain [1]. The agriculture sector which employs about 1.3 billion people that is about 28% population of the world, is most vulnerable to the problem of lower back pain and disorders [2]. In India, nearly 8% of people live with a disability due to lower back problem, and 4.6% of people live with Disability-Adjusted Life Years (DALYs) in musculoskeletal disorder. The rate of change DALYs in respect of lower back pain has increased from 1.2% to 2.3% between the years 1990 to 2016 [1]. When an external load is not present, the Erector Spinae (ES) muscles are strong enough to lift the trunk from a stoop bending. However, only back muscles alone are insufficient to perform stoop bending when substantial external loads are present [3].

Many assistive devices innovated in recent times and launched commercially, claim to reduce lower back loading in the stooped posture. There are two types of devices: motorized and non-motorized. An electric motor-assisted device to aid with trunk flexion and extension which could reduce the compression force on the lumbosacral disc was developed by Satoshi Kawai, Hiroshi Yokoi *et al.* [4], [5]. That device is based on a power assist robot, which is controlled by EMG signals [4]. Artificial neural networks (ANN) were used for detecting individual differences in EMG [4]. Additionally, several other power assistive devices have been proposed [6], [9]. These devices were large and not economically feasible. Several non-motorized assistive devices, which use spring elements to realize passive stooping assist, such as HappyBack [10], the Bending Non-Demand Return [10], and the Bendezy [10], have been evaluated by Barrett. These are based on springs that provide passive resistance during sagittal flexion [10]. During lifting tasks, similarly, a personal lift assist device (PLAD) had also been shown to reduce back muscle activity [11], [12]. These devices reduced muscle activity in the back; however, it might increase leg muscle fatigue, and people are not comfortable with wearing these devices. These are also heavy, costly and complex due to the complex mechanism involved in it.

The JaipurBelt is an affordable, lightweight, protective and therapeutic globally patented device that supports the spine and waist while allowing all mobility. The concept of load diversion is very common in orthopedic and rehabilitation practice, but its patented load adjustment mechanism makes it especially innovative. Fig.1 shows the photograph of JaipurBelt. This is complete with a shoulder strap, thigh pad and a back strap. The JaipurBelt is ergonomically designed to reduce, distribute and divert the load from the upper torso, spine and waist. It is based on single point load adjustment mechanism & efficient torque storing mechanism. The single point makes flexible element to pull when the upper element is deflected from an initial position, wherein such deflection results in storing energy in resilient mean. This stored energy provides a restoring torque in characteristic pattern, which enables the upper element and lower element to restore to the initial position of mechanical assembly. The angular adjustment in rack sub assembly adjusts the torque angle or torque pattern, and the radial adjustment in rack assembly is enabled to adjust the effective amount of torque to be delivered [13]. It is a human-powered, efficient, and economical exoskeleton that supports the spine and waist by sharing physical workload up to a predefined, variable limit without restricting body movements [13]. This device has got 9 patents from different countries like USA, India, Russia, China and Europe etc.

Fig.1. JaipurBelt- An exoskeleton belt system for body support

Electromyography (EMG) is a diagnostic procedure for characterizing the muscular force and fatigue [14], [16]. It measures the sum of action potentials of all the active motor units around the electrodes while muscle action is being performed. The surface EMG was used to evaluate the effectiveness of JaipurBelt.

II. Experimental Procedure

A. Subjects

This trial was conducted on 100 participants (Summarized in Table I). The participants include healthy, people with back pain, people with bending jobs, industrial workers, construction workers and also farmers. However, due to subject movement, bending and load lifting tasks, lead fault, some data were not able to record properly. Analysis was conducted on only 79 participants whose data has been recorded properly.

TABLE I. Summary Of The Subjects

No of subjects	100
Age	30.15±8.2 years
Height	162.93±6.4 cm
Body mass	55.53±8.22 Kg
Height of waist from ground level	91.35±8.3 cm

B. Instrumentation

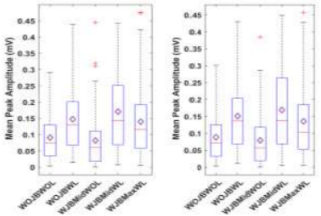
EMG data were acquired with the iWorx ix-ta-220 Bio-potential measurement system. The EMG was measured from six muscles which are the ninth thoracic vertebra (EST9) and fourth lumbar vertebra (ESL4) of Erector Spine Muscles, Multifidus (MF), Gluteus maximus (GM) from hip muscles, Quadratus Lumborum (QL) and Rectus Femoris (RF). The electrodes are placed based on the SENIAM recommendation [16]. Fourteen silver chloride (AgCl) electrodes were used, two for input (+V, -V) from each muscle and the remaining two for the reference or ground. The Goniometer available with iWorx platform was used to measure the bending angle during bending task. The goniometer data was also time synchronized with the EMG data, which were used for determining the start & end activity. LabScribe software tool was used for viewing the EMG acquired data, which were then exported in MATLAB readable '.mat' file format. Data processing and statistical analysis were done in MATLAB and Microsoft Excel.

C. Experimental Design

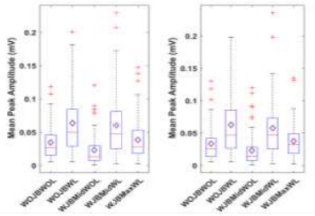
The protocol for the trial was approved by the IRB of SDMH Hospital, Jaipur. This study was registered with Central trial register of India (CTRI registration number CTRI/2017/01/007649). Before the trial, the subjects read and signed an information & consent form approved by the ethical committee. The data of each subject's age, height, weight and health history was recorded. The subject was then asked to perform warm-up for stretching their lower and upper body joints before placement of electrodes. The electrodes were placed at the designated locations. After this, the subjects performed the stooping and standing activities while EMG and goniometer data were simultaneously acquired. The protocol had five sets of events; these are categorized as - without JaipurBelt without load (WOJBWOL), without JaipurBelt with load (WOJBWL), with JaipurBelt without load at a medium level of support (WJBMidWOL), with JaipurBelt with load at a medium level of support (WJBMidWL) and with JaipurBelt with load at a maximum level of support (WJBMaxWL).

Each set consists of five to seven stooping tasks, with a resting time of 3 to 5 minutes between each set. The load provided was lifting of 15 KG weights. The picture of a subject undergoing the trial is shown in Fig. 2.

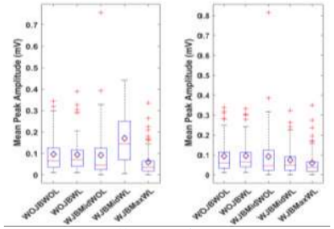
Fig. 2. An image of a subject performing designed experiment



(d) QL SBD and SBU



(f) RF SBD and SBU



(e)GM SBD and SBU

Fig. 4. Comparative box plots of reduction in EMG peak from all six muscles for Stoop Bending Down(SBD) and Stoop Bending Up(SBU) activities.

TABLE II. PERCENTAGE DECREASE IN EMG AMPLITUDE AND CORRESPONDING P-VALUES IN SBD AND SBU ACTIVITIES BASED ON AVERAGE PEAK VALUE

Muscle	Percentage decrease in WOJBWOL Vs WJBMidWOL	p-value	Percentage decrease in WOJBWL Vs WJBMidWL	p-value	Percentage decrease in WOJBWL Vs WJBMaxWL	p-value
Stoop Bending Down						
EST9	-13.78%	0.155	8.02%	0.2252	79.96%	1.76×10^{-15}
ESL4	31.23%	0.003	5.14%	0.345	43.08%	0.000271
MF	24.85%	0.036	-15.55%	0.142	3.07%	0.398
QL	9.77%	0.211	-15.72%	0.095	5.01%	0.344
GM	4.93%	0.362	20.63%	0.023	36.97%	2.08×10^{-5}
RF	-11.30%	0.001	5.49%	0.326	40.29%	5.02×10^{-5}
Stoop Bending Up						
EST9	-10.06%	0.219	-7.10%	0.264	81.99%	5.6×10^{-15}
ESL4	14.23%	0.006	6.19%	0.319	45.71%	0.0001
MF	24.40%	0.039	-14.67%	0.155	5.82 %	0.315
QL	10.60%	0.191	-11.70%	0.163	17.14%	0.205
GM	2.23%	0.439	22.37%	0.012	38.12 %	2.31×10^{-5}
RF	31.76%	0.002	7.96%	0.253	40.17 %"	4.67×10^{-5}

One way ANOVA was performed to check if there is a significant difference between the five conditions. One way ANOVA test was performed for each muscle for SBD and SBU. The F ratio and p-value was calculated from the EMG data to find the reduction of muscle activity using one way ANOVA test. The calculated F value should be greater than the $F_{critical}$ (F ratio) value for a significant difference among the groups. The result of the ANOVA test shows that there is a significant difference between the five conditions since the calculated F value is greater than the $F_{critical}$ in all the condition. The Table III shows the result for one way ANOVA test for each muscle.

TABLE III. RESULT FOR ONE WAY ANOVA TEST

Muscles	Calculated F	$F_{critical}$	p-value
SBD			
EST9	25.22762	2.394824	1.336×10^{-18}
ESL4	33.58231	2.394824	4.39×10^{-24}
MF	7.460282	2.394824	8.4732×10^{-6}
QL	10.8837	2.394824	2.25×10^{-8}
GM	2.769277	2.394824	0.027125
RF	16.71463	2.394824	1.18×10^{-12}
SBU			
EST9	25.89624	2.394824	4.73×10^{-19}
ESL4	32.97363	2.394824	1.07×10^{-23}
MF	7.232388	2.394824	1.2602×10^{-5}
QL	11.80143	2.394824	4.65×10^{-9}
GM	2.701785	2.394824	0.030312
RF	16.4195	2.394824	1.92×10^{-12}

A. Analysis based on average area under the curve

EMG traces can be analyzed with standard amplitude parameters. For example, area, peak, and slope are the standard amplitude parameters. The area is the true mathematical integral under the EMG amplitude value for a given analysis period [18]. The mean EMG parameter represents the gross innervation input of the considered muscle for a given task for comparison [18].

Data analysis based on calculating average area under the curve was done for all the protocols. A paired t-test was performed based on average area under the curve to compare WOJBWOL vs WJBMidWOL, WOJBWL vs WJBMidWL and WOJBWL vs WJBMaxWL, to establish the significance of the reduction in EMG amplitude. Table IV shows the p-values for all the muscles in both stoop bending down and Stoop bending up activities. The results obtained through this is similar to the previous analysis based on the average peak amplitude shown in Table II. This alternate analysis also validated our previous analysis.

TABLE IV. P-VALUES IN SBD AND SBU ACTIVITIES BASED ON AVERAGE AREA UNDER CURVE

Muscle	WOJBWOL Vs WJBMidWOL	WOJBWL Vs WJBMidWL	WOJBWL Vs WJBMaxWL
Stoop Bending Down	**p-value**	**p-value**	**p-value**
EST9	0.155512	0.225258	1.757×10^{-15}
ESL4	0.003253	0.345402	0.000271
MF	0.036087	0.142779	0.39836
QL	0.210943	0.095881	0.34465
GM	0.362081	0.023052	2.077×10^{-5}
RF	0.000709	0.326648	5.0213×10^{-5}
Stoop Bending Up			
EST9	0.219397	0.264135	5.59×10^{-15}
ESL4	0.005714	0.31983	0.0001
MF	0.039153	0.155737	0.3157
QL	0.1914	0.163588	0.2059
GM	0.439833	0.012875	2.30×10^{-5}
RF	0.001597	0.253563	4.674×10^{-5}

V. DISCUSSION

The analysis of the result for each muscle is given below:

A. Ninth Thoracic Vertebra of Erector Spine (EST9)

The thoracic and the lumbar components of erector spine are powerful extensors of the vertebral column for extending the trunk. When the device is set at its medium level of support, the percentage reduction is negligible with or without the load, and there is no significant difference. For the maximum level of support with the load, it shows about 79.96% reduction of muscle activity in stoop bending down and 81.99 % reduction in stoop bending up. The overall reduction of muscle activity in this muscle is around 80.97%.

B. Forth Lumbar Vertebra of Erector Spine (ESL4)

When the load is not present, and the device is set at the medium level of support, around 31.23% reduction of muscle activity in stoop bending down and 14.23% reduction in stoop bending up condition. With load and the medium level of support, there is no significant difference compared to without JaipurBelt. WJBMaxWL condition shows a significant reduction in muscle activity of 43.08% in stood bending down and 45.71% in stoop bending up conditions. The overall reduction of muscle activity in this muscle is around 44.39%.

C. Multifidus (MF)

The bilateral contraction of multifidus produces extension of the vertebral column for adapting their length to stabilize the vertebrae. It functions as extensible ligaments that stabilize the vertebral column. When the load is not present, and the device is at the medium level of support, it reduces the muscle activities to 24.85% at stoop bending down and 24.40 % at stoop bending up. When the load is present, and the device is at its maximum level of support, there is no significant difference compared to WOJBWL condition. The overall reduction of muscle activity in this muscle is around 24.62%.

D. Quadratus Lumborum (QL)

The WJBMidWOL condition shows around 9.77% reduction in muscle activity in stoop bending down and 10.60% reduction in stoop bending up. There is no significant difference in other conditions. The overall reduction of muscle activity in this muscle is around 10.18%.

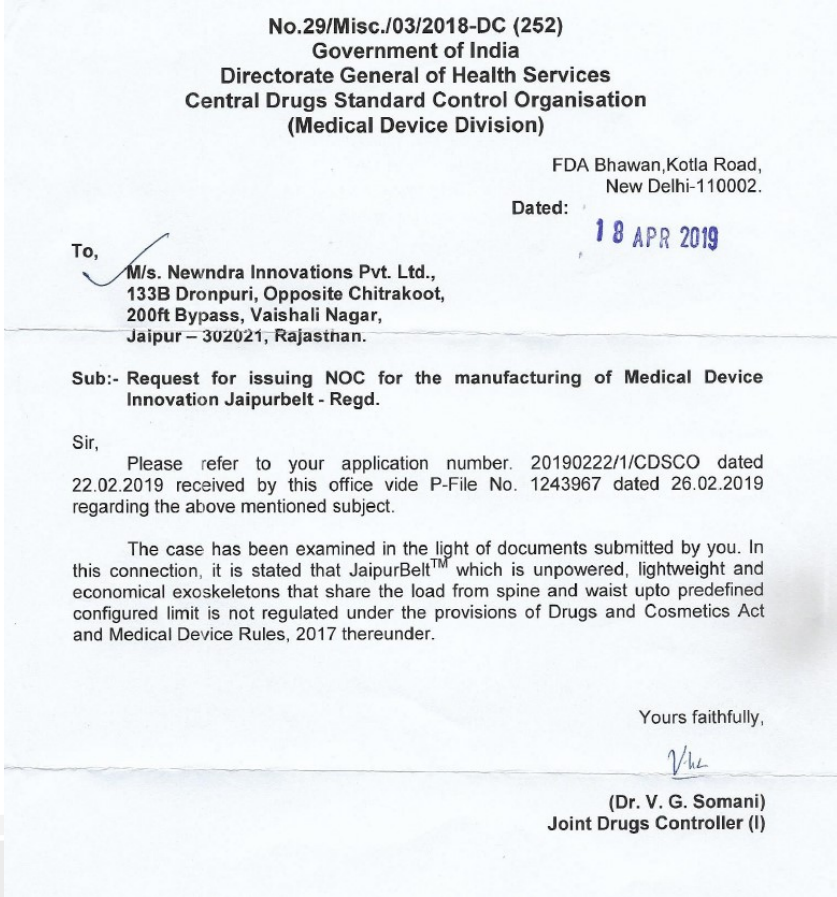
E. Gluteus maximus (GM)

In WJBMidWOL condition, there is no significant difference. The WJBMidWL condition shows a significant reduction in muscle activity of 20.6% in stood bending down and 22.37% in stoop bending up. The WJBMaxWL condition shows a significant reduction in muscle activity of 36.97% in stood bending down and 38.12% in stoop bending up. The overall reduction of muscle activity in this muscle is around 37.54%.

F. Rectus Femoris (RF)

The WJBMidWOL condition shows no reduction in muscle activity in stoop bending down and 31.76% reduction in stoop bending up. With load and the device at its medium level of support, it shows no significant difference. WJBMaxWL condition shows a significant reduction in muscle activity of 40.29% in stoop bending down and

NoC by CDSCO



No.29/Misc./03/2018-DC (252)
Government of India
Directorate General of Health Services
Central Drugs Standard Control Organisation
(Medical Device Division)

FDA Bhawan,Kotla Road,
New Delhi-110002.

Dated: 18 APR 2019

To,

M/s. Newndra Innovations Pvt. Ltd.,
133B Dronpuri, Opposite Chitrakoot,
200ft Bypass, Vaishali Nagar,
Jaipur – 302021, Rajasthan.

Sub:- Request for issuing NOC for the manufacturing of Medical Device Innovation Jaipurbelt - Regd.

Sir,

Please refer to your application number. 20190222/1/CDSCO dated 22.02.2019 received by this office vide P-File No. 1243967 dated 26.02.2019 regarding the above mentioned subject.

The case has been examined in the light of documents submitted by you. In this connection, it is stated that JaipurBelt™ which is unpowered, lightweight and economical exoskeletons that share the load from spine and waist upto predefined configured limit is not regulated under the provisions of Drugs and Cosmetics Act and Medical Device Rules, 2017 thereunder.

Yours faithfully,

(Dr. V. G. Somani)
Joint Drugs Controller (I)

About the company

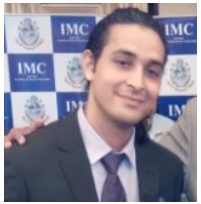
About Newndra Innovations Pvt Ltd

Vision: Pain-free life for the common men around.

Mission: To offer world-class assistive devices at a revolutionary price to enable pain-free life for the common men around.

- With 11 Granted patents on Exoskeletons, we are India's first and leading Exoskeleton company.
- Product used by companies like
- With 4 National Awards and 15 prestigious awards and we are supported by BIRAC, Govt of India.

Team



Ganesh Ram Jangir, CEO
Inventor JaipurBelt, IndoKnee, ArmMax
Passionate Technoetreprenure.10yrs exp.
3 National Awards, IP, TDF, IUSSTF, CII, BIRAC, India Today Trail Blazer, 9 Granted patents, 3 Clinical Trials.

Dr. Aalok, Strategist and Expansions
Professor of Physics Central University, Amarkantak
21 years experience in research, teaching, and mentoring. Coordinator first Microsoft Innovation Academy.
Groomed numerous Innovators and Entrepreneur.

Dr. Anil Jain, Clinical Head
Honorary Consultant & HOD.
Dr. P.K.Sethi Rehab. Centre, SDMH Hospital, Worked with Dr. P.K. Sethi (Inventor of Jaipur Foot) for 12 years. TIMES Wellness, Innate Excellence, Young Achiever, Jain Bhushan Awardee.

Mr Ratan Lal, Production Head.
More than 12 Year of experience in production and manufactuing. Has worked on IndoKnee and JaipurBelt from design to production.

Mentors

Dr Premnath : Mentor
Director, Venture Center, Pune
Head, NCL Innovations, NCL
Scientist, PSE, NCL
PhD, MIT, Cambridge, USA (Academic Family Tree) B. Tech, IIT- Bombay

Mr. Aram Akopyan. Business Development
Business Developer and Healthcare Market Penetration Expert Medical Doctor specializing in PM&R,

Media Coverage

INNOVATION

Lightweight Jaipur Belt boon for people with back pain

Ganesh Jangir with Dr Anil Jain head of PK Sethi Rehabilitation Centre, Jaipur, explaining the benefits of Jaipur Belt.

THE MODIFIED JAIPUR BELT, WEIGHING BETWEEN 1.5 AND 1.7KG WILL BE AVAILABLE FOR ₹2,300-2,500

TDT Exclusive

JaipurBelt™

Yet Another Pride of Jaipur

- JaipurBelt was appreciated by Ex. Indian president Late Dr APJ Abdul Kalam and Dr R A Mashelkar, Ex. Director General CSIR Gol.
- After exhaustive work of almost a year its design and materials have been completely changed.
- It got selected among the best five innovations of 2014 in India.
- Based on results of clinical trials the belt would be further modified and manufactured at large-scale followed by extensive marketing in India and abroad.

Jaipur. The newly designed JaipurBeltTM – spinal brace is now ready for extensive clinical trials to be conducted at Dr. P.K. Sethi Rehabilitation Centre, Santokba Durlabhji Hospital in association with Prof. Rajesh from Malviya National Institute of Technology (MNIT), Jaipur.

JaipurBeltTM – an unpowered and lightweight exoskeleton was invented by Ganesh Jangir, brought up in high risk person involved in a profession which requires frequent forward bending movements like farm labourers and factory workers as well as back pain sufferers due to prolonged sitting and standing.

The conversion of prototype structure to a useful belt has many stages. It was supported by National Innovation Foundation, Ahmedabad and selected by Indian Institute of Science, Bangalore for fellowship award. Also dept of Science and Technology, GoI provided funds for up gradation of concept and product in association with Dr. P.K. Sethi Rehabilitation Centre headed by Dr. Anil Kumar Jain. JaipurBeltTM at this stage was cumbersome to use. It was further modified and was reduced in

Endowment Fund (USISTEF) involving Newndra Innovations started by its innovator Ganesh Jangir, Dr. Anil Kumar Jain, Dr Ashok Pandya and a US partner Paul and Rich from Medspark, California.

Ganesh was nominated for fully sponsored participation in Global Entrepreneurship Summit held at Nairobi, Kenya which was inaugurated by US president

CoverStory

HotStart-up

NEWNDRA INNOVATIONS

Newndra's revolutionizing 'JaipurBelt'

Hailing from Jaipur, Rajasthan, Mr Ganesh R Jangir (26) was the first engineer from his rural village, who had an unquenchable passion to help farmers and people from his own village.

During his school vacations, he had to visit at his village farm. He felt overworking back pain shooting through his body just after a few minutes of working. He realized that this was the tale of every farmer in the country.

Dr Ganesh Jangir

He says that doctors' advice of getting good rest after a hard labor was next to impossible for farmers and workers. That 'sick-starved' within him to think in different ways and try hundreds of attempts to innovate a device that could solve the issue. The end result? The birth of the 'Jaipur-Belt' (Belt System for Body Support).

"I took my idea to National Innovations Foundation and got the needed support for prototype development and patent filing. Later I met the details of the functional prototype to Indian Institute of Science in Bangalore for Dalton Valgus & Pronation Valgus (DVPV) Fellowship. I got through there. That gave me enough confidence of commercializing the device. I once said had to be done but didn't know how and when," recalls Mr Ganesh, co-founder, Newndra Innovations, which was started in 2016.

Mr Ganesh, the inventor of the says that the company's product Jaipur Belt does across the globe especially for people engaged in manual labour.

Paul Scott
MedSpark, LLC
San Luis Obispo

Ganesh Ram Jangir
Newndra Innovations
Private limited
Jaipur

A DEVICE TO REDUCE 'LOAD ON THE SPINE'

Workers, fasten your belt to reduce pai

HAMZAKHAN
JAIPUR, JUNE 25

AFTER JAIPUR Foot, innovators in Rajasthan have now come up with Jaipur Belt, an unpowered and lightweight exoskeleton which, according to its inventors, reduces the load on the spine by upto 80 per cent. Clinical trials are set to begin soon.

The story of innovation starts eight years ago when Ganesh Jangir, then a student of Class XII, used to work on a farm during his vacations in Nagaur.

"My back used to ache while working. When I asked others, they said they also experienced similar pain," Jangir told The Indian Express. "The workers complained that the doctors would prescribe painkillers but the pain returned soon," he said.

In 2008, Jangir set out to find a way to reduce the burden on the spine. He approached the National Innovation Foundation as well as the Department of Science and Technology, Government of India, and received financial support for his project. Soon after, he shifted to Jaipur.

"Since I required feedback from doctors, I approached the Dr P K Sethi Rehabilitation Centre, Santokba Durlabhji Hospital, Jaipur, in 2012," said Jangir, who is now 27.

Over the years, the project has been evolving. In 2014, the work was presented to the Indian

A worker uses a JaipurBelt. Express

Merchant Chambers, Mumbai, and was selected among the best five innovations of 2014 in India.

The same year, Jangir launched his Jaipur Belt company, Newndra, in Nagaur.

Last year, Jangir was nominated for a fully sponsored participation in Global Entrepreneurship Summit. Earlier this year, the belt was selected for US, India Science and Technology Endowment Fund and US partner Medspark from California, among others. Along the way, it also received appreciation from former President A P J Abdul Kalam and former CSIR chief R A Mashelkar; the company has also filed more than six patents and intellectual Property rights claims in India and abroad.

"It's very useful for workers in manufacturing, construction, and all labour-intensive industrial units such as Medium Small and Micro Enterprise and the agriculture sector. It for the people who down and pick up fr frequently or have problems such as sciatica, spondylitis," said head of rehabilitati ment at Santokba Du

"After an exhaus long work, its design rails have been c changed. Initially, it w some issue. It was m its weight was redu placing metal parts mm plastics. The soft cover made it easy t cosmetically more ac patients," Jain said.

"The newly-desig Belt spinal brace is now extensive clinical trial ducted at Dr. P K Sethi ilation Centre at our association with Pr from Malviya Nationa of Technology Jaipur.

Project and Ask

Project: Sharmik-Sambal Relieve the load, Retain the livelihood

Goal: Help 100+ low-income construction worker men and women by reducing the risk of spinal injuries or managing lower back pain by providing them exoskeleton JaipurBelt and thus helping them retain their livelihood.

Preferred age group: 35-45 years.

Area: Rural and Semi-Urban

Partner NGO: National Institute of Woman Child and Youth Development

Timeline: 6 months

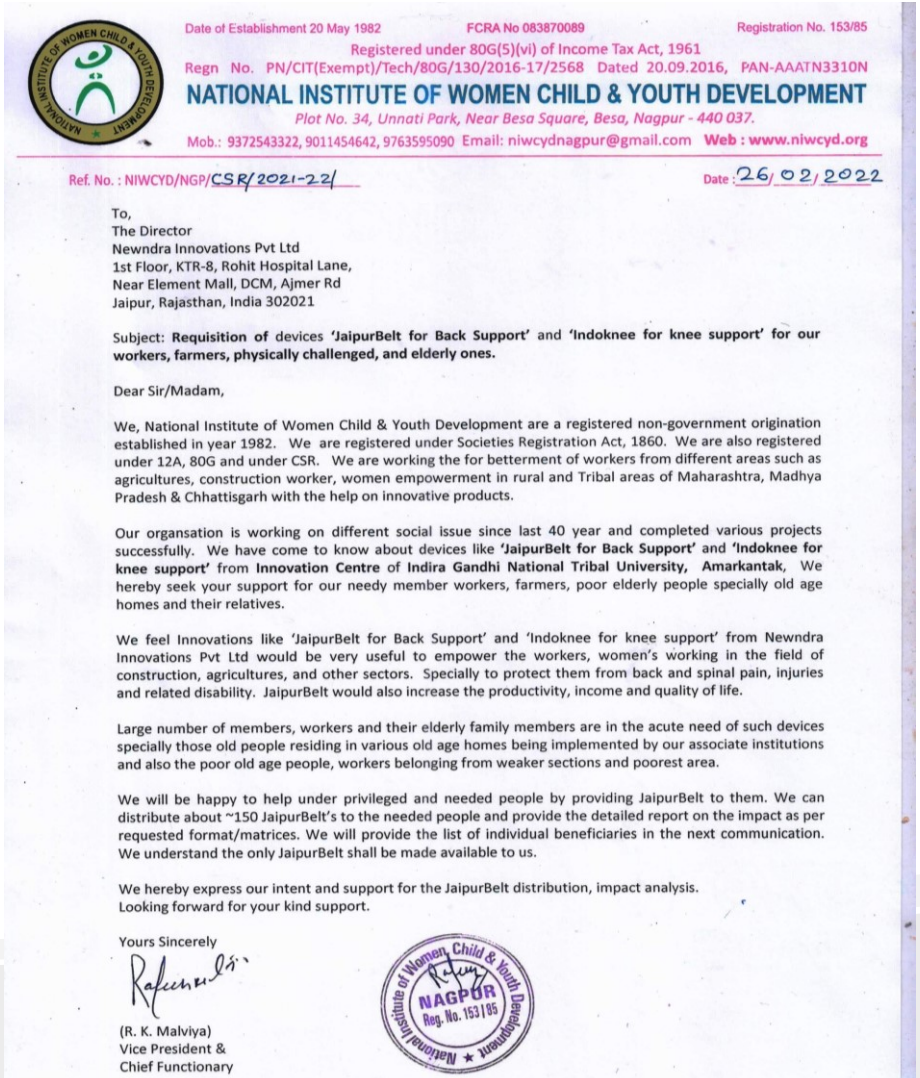
Budget and timeline.

INR 18 Lakhs per 100 units of JaipurBelt.

Sr No.	Activity	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
Milestone 1							
1	Partner with NGOs and prepare list of people in need.						
2	Distribute JaipurBelt.						
Milestone 2							
3	Support if required / Take the feedback.						
4	Impact Analysis						
5	Reporting						

Collaborations

We have partnered with a recognized NGO “The **National Institute of Woman Child and Youth Development**” to distribute to needy people.



Date of Establishment 20 May 1982 FCRA No 083870089 Registration No. 153/85

Registered under 80G(5)(vi) of Income Tax Act, 1961

Regn No. PN/CIT(Exempt)/Tech/80G/130/2016-17/2568 Dated 20.09.2016, PAN-AAATN3310N

NATIONAL INSTITUTE OF WOMEN CHILD & YOUTH DEVELOPMENT

Plot No. 34, Unnati Park, Near Besa Square, Besa, Nagpur - 440 037.

Mob.: 9372543322, 9011454642, 9763595090 Email: niwcydnagpur@gmail.com **Web : www.niwcyd.org**

Ref. No. : NIWCYD/NGP/CSR/2021-22/ Date : 26/02/2022

To,
The Director
Newndra Innovations Pvt Ltd
1st Floor, KTR-8, Rohit Hospital Lane,
Near Element Mall, DCM, Ajmer Rd
Jaipur, Rajasthan, India 302021

Subject: **Requisition of** devices **‘JaipurBelt for Back Support’** and **‘Indoknee for knee support’ for our workers, farmers, physically challenged, and elderly ones.**

Dear Sir/Madam,

We, National Institute of Women Child & Youth Development are a registered non-government origination established in year 1982. We are registered under Societies Registration Act, 1860. We are also registered under 12A, 80G and under CSR. We are working the for betterment of workers from different areas such as agricultures, construction worker, women empowerment in rural and Tribal areas of Maharashtra, Madhya Pradesh & Chhattisgarh with the help on innovative products.

Our organsation is working on different social issue since last 40 year and completed various projects successfully. We have come to know about devices like **‘JaipurBelt for Back Support’** and **‘Indoknee for knee support’** from **Innovation Centre** of **Indira Gandhi National Tribal University, Amarkantak**, We hereby seek your support for our needy member workers, farmers, poor elderly people specially old age homes and their relatives.

We feel Innovations like ‘JaipurBelt for Back Support’ and ‘Indoknee for knee support’ from Newndra Innovations Pvt Ltd would be very useful to empower the workers, women’s working in the field of construction, agricultures, and other sectors. Specially to protect them from back and spinal pain, injuries and related disability. JaipurBelt would also increase the productivity, income and quality of life.

Large number of members, workers and their elderly family members are in the acute need of such devices specially those old people residing in various old age homes being implemented by our associate institutions and also the poor old age people, workers belonging from weaker sections and poorest area.

We will be happy to help under privileged and needed people by providing JaipurBelt to them. We can distribute about ~150 JaipurBelt’s to the needed people and provide the detailed report on the impact as per requested format/matrices. We will provide the list of individual beneficiaries in the next communication. We understand the only JaipurBelt shall be made available to us.

We hereby express our intent and support for the JaipurBelt distribution, impact analysis.
Looking forward for your kind support.

Yours Sincerely

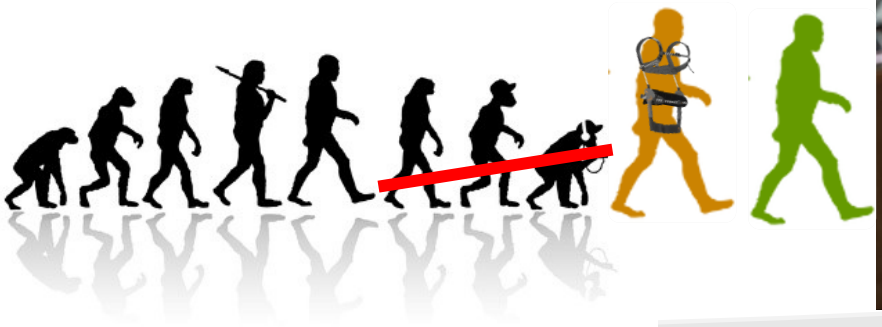
(R. K. Malviya)
Vice President &
Chief Functionary

National Institute of Women Child & Youth Development NAGPUR Reg. No. 153/85

We are building an exoskeleton for the great multitude.

Would you be part of this disruption?

Thank you



ganesh@newndra.com | 9461552772 | www.newndra.com

Thank you

For more information

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