



## ANTI-DECUBITUS CUSHION EVALUATIONS: JARIK FLUID CUSHION VERSUS EXISTING CUSHION

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### PURPOSE

This study compares 81 patient evaluations, conducted at 8 facilities, of the JARIK Fluid Wheelchair Cushion compared to the cushion previously used by those patients. The JARIK Cushion was specifically developed for use by spinal cord injured patients in less resourced environments.

The first goal of the study is to measure user and study coordinator satisfaction and patient outcomes among spinal cord injured patients. The second goal is to assess cushion appropriateness for use in less resourced environments. The third goal is to identify cushion design modifications to be made before making the JARIK Fluid Cushion widely available.

### METHODS

Phase 1: 2-3 Week trials Completed among 81 patients on Sep. 1st, 2010

Future phase 2,3,4: 6,12,24 Months Follow-up among 24 patients using JARIK Cushion

All 8 centers were provided 6 JARIK Fluid Cushions and a four page questionnaire to be filled out by coordinators for each patient participating in Phase 1.	
Participating Facilities	Coordinator
Centre for Rehabilitation of Paralyzed (CRP), Dhaka, Bangladesh	Dr. Shariful Islam
Indian Spinal Injuries Centre (SIC), Delhi, India	Soniya Goel
University of Malaysia, Kuala Lumpur, Malaysia	Dr. Tze Yang Chung
Spinal Injury Rehabilitation Centre (SIRC), Nepal	Dr. Raju Dhakal
GPR, Pokhara, Nepal	Sandra Boone
Shonequip, Capetown, South Africa	Jen Greenhough
Rehabilitation Hospital, Kalaniya, Sri Lanka	P.K.A. Kitsiri
Handicap International, Hanoi, Vietnam	Eric Weerts
This is to be followed by a one page form to be filled out at the completion of phase 2, 3 & 4. Funding is provided by Rick Jay (JARIK Medical).	

### Demographic Data and Findings of Phase I:

Gender	Male 83%; Female 17%
Age	10-20 7%; 21-30 28%; 31-40 32%; 41-50 14%; 51-60 11%; over 60 7%
Type of injury	Quadriplegic 22%; Paraplegic 70%; Other 7%
Buttock Sensation	None 66%; Some 21%; Normal 14%
Average daily hours seated	0-2 4%; 3-5 3%; 6-10 72% ; over 10 22%
Prior cushion used:	None 9%; Foam 70%; ROHO 7%; JAY 4%; Other 10%
Braden scale score: (Score <19	<=12 10%; 13-14 26%; 15-16 28%; 17-19 31%;

indicates "at risk of pressure sore")	over 19 5%
History of pressure sore(s):	Yes 54%; No 46%
Patient has existing sore:	No 79%; Stage 1 5%; Stage 2 7%; >Stage 2 3%, NA 6%
Number days JARIK Cushion used:	<15 11%; 15-20 52%; 21-25 31%; Over 25 6%
Hours per day Cushion used:	0-2 3%; 3-5 7%; 6-10 74%; over 10 16%
Change in skin condition:	No 83%; Improved 10%; Worsened 5%
Change in spasticity:	No 89%; Reduced 4%; Increased 4%
<b>WOULD PATIENT BUY JARIK CUSHION IF AFFORDABLE? YES 83% NO 17%</b>	

**CHART OF RESULTS - PHASE 1:** (Note: Coordinator assessments were almost identical to patient assessments and are therefore not listed below.)

Have patient rate existing cushion "Parameters" on a 1 to 10 scale, where (0="Least", 5="Average", 10="Highest" and N.A. = Not Applicable/don't know)			
Parameter	AVERAGE EXISTING cushion rating	AVERAGE JARIK cushion rating	% IMPROVEMENT
Ability to protect against skin breakdown	6.1	8.1	+33%
Ability to provide sitting stability	7.0	8.6	+23%
Ability to hold hips to back of chair	6.9	8.2	+19%
Ability to help level the hips	6.6	8.0	+21%
Ability to help propel and function in chair	5.7	7.4	+30%
Ability to prevent heat build-up	5.0	7.1	+42%
Ability to prevent perspiration	5.5	7.0	+27%
Cushion weight	7.1	5.3	-25%
Patient comfort	6.6	8.2	+24%
Ease transfers	5.9	6.9	+17%
Ease of use/maintenance	6.1	6.6	+8%
<b>OVERALL SATISFACTION</b>	<b>6.7</b>	<b>8.0</b>	<b>+19%</b>

## CONCLUSIONS

- Patients showed a strong preference for the JARIK Fluid Cushion (over the cushion previously used by each patient) on 11 of the 12 attributes measured. (Ratings by study coordinators were similar).
- On "Overall Satisfaction", patient ratings of the JARIK Cushion showed 19% improvement over existing cushion (despite having to switch from a cushion they were used to using).
- 83% of patients would purchase a JARIK Cushion if it were affordable.
- The JARIK Cushion appears, so far, to be highly appropriate for use by spinal cord injured patients in the countries participating. The only parameter rated lower than existing cushion was weight (the JARIK Cushion weighs about 3kg (7 lbs) compared to about 1kg (2.5lbs) for a foam cushion).
- Three JARIK Cushion design or production improvements were identified during the evaluations, allowing minor adjustments prior to the start of regular production in 2011.

**ACKNOWLEDGMENTS:** The Indian Spinal Injuries Centre and JARIK Medical wish to thank all of the facilities and coordinators listed above for their participation in this study. Their time and effort were donated.



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**WHEELCHAIR CUSHION SITTING PRESSURES: JARIK, JAY, ROHO, AND FOAM**

This study was conducted by Rick Jay, developer of the Jarik and Jay Cushions for wheelchairs and Cindy Duff in-patient physical therapy supervisor at Denver Health Medical Center in Denver Colorado.

## STUDY PURPOSE

The primary purpose of the study was to:

1. Validate that the Jarik Cushion prototype currently being tested at 8 spinal centers in Asia and Africa is generally comparable in pressure relief to the Jay and Roho Cushions and significantly better than a high end, flat foam cushion (4" dual-density memory foam cushion).
2. Validate whether the new "extra-supple" urethane casing developed for fluid pad production could further reduce the pressures on the Jarik Cushion.

The study was conducted primarily for Jarik Medical's product development purposes, on only one patients (with very boney buttocks), and is not intended to be a tightly controlled study on a broad variety of users that can be used to predict outcomes on patients over the longer term. (For that purpose, we recommend referring to the patient outcome study on Jarik Cushions among 8 spinal cord centers that is being coordinated by the Indian Spinal Centre in Delhi, India.) at [www.jarikmedical.com](http://www.jarikmedical.com)

## STUDY METHOD

Cindy Duff was asked to locate a spinal cord injured patient with extra-boney buttocks. A pressure-mapping device manufactured by Xsensor was utilized to map pressures at the right and left ischials and trochanters, as well as the coccyx. Patient was seated in a wheelchair on the available cushions, with footrests adjusted for proper leg support and proper adjustment of air (Roho) or fluid (Jarik and Jay) to prevent bottoming-out.

PRESURES MEASURED (in lbs per square inch, where 1 psi = 51.7mm mercury).

1) The patient was a 48 year old T10 spinal injury, 28 years post injury. He had a pressure sore on his right ischial that was healed 20 years ago. For the last 15 years, he has sat on the Jay 2 and Jay 2 Deep Contour Cushions. His approximate height is 5'10" and weight 175 lbs.

	Ischial		Coccyx	Trochanter	
	Right	Left		Right	Left
Roho Quadtro	1.95	1.68	1.21	.66	.58
Jay J2	1.56	1.58	1.35	.78	.77
Jarik Prototype	1.63	1.65	0.93	.97	.84
Jarik "extra-supple"	1.53	1.56	0.93	1.0	.75
4" memory foam	2.20	2.40	1.84	.58	.60

## STUDY CONCLUSIONS

On the patient studied, the researchers' hypotheses were all confirmed. The Jarik Cushion had the essentially the same pressures as the Jay and the Roho. The "extra-supple" Jarik pad performed better than the Jarik prototype tested by the Indian Spinal Centre. And the high-end foam cushion had significantly higher pressures than the Roho, Jay or Jarik cushions.

However, the most important indicator of a cushion's pressure relief quality can only be proven with actual use – which is the purpose of the multi-facility outcome study currently being conducted on the Jarik Cushion by the Indian Spinal Injuries Centre.

### The Cushion for Life



Because every wheelchair user needs a proper cushion to help prevent posture deformities and some need a special cushion to help prevent lethal pressure sores.

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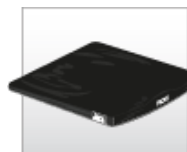
### Life-Saving



The JARIK Fluid Cushion helps prevent the pressure sores that kill tens of thousands of people in developing countries due to infected pressure sores.

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### Better Posture And Function



For people not at pressure sore risk, the JARIK Contoured Foam Cushion provides better posture, balance and comfort.

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