RICE SPORTS MEDICINE

WHITEPAPER

Study on BIMINI NanoJet Oxygen Perfusion System Effects on Increased Performance and Muscle Recovery

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Introduction

In the last decade, competitive sports continue to increase the physical intensity required and so has the need to recover quicker from injuries and workouts. Therefore, there is an urgent need to develop more effective and accelerated treatments that allow the athlete to return to competition faster than with the normal course of rehabilitation and recovery periods.

Recovery is an important aspect of an athlete's regime to perform at the highest level. Whether it's during practice, a game, or the off-season, how well an athlete recovers can determine what they are able to achieve. Currently, there are many different devices and techniques that athletes use to assist in recovery.
The BIMINI NanoJet Oxygen Perfusion System can be best described as a combination of oxygen and hydrotherapy as it turns any body of water into an oxygen-saturated environment for athletes. The Bimini NanoJet Oxygen Perfusion System is a technological breakthrough for perfusion of oxygen into the body's soft cell tissue using Ultra Fine Bubbles (nano bubbles) while soaking in a comfortable tub. These bubbles are so small they can penetrate through skin pores directly into soft tissue, allowing for exceptionally deep treatment. Rice University sports medicine has been utilizing the Bimini NanoJet System for over six months and has treated over a hundred (100) athletes for recovery, rehabilitation and performance.

Purpose

The purpose of this study is to utilize a SensoKinetoGram (SKG) which provides objective physiological measurements to screen for injuries, ailments and to monitor recovery. The SKG RU-FIT model SR-3053 offers objective monitoring for

sports training programs to aid trainers and coaches as they develop and improve the coordination and reaction times of their athletes. The SKG system is FDA approved and compliant with HIPAA regulations.

Methods

The SKG was utilized on ten (10) participants that volunteered for this study, five (5) from Rice Athletics and five (5) physically active middle aged participants. All participants were considered physically normal and healthy. To measure the participants physiological capabilities, the RU-Fit Model SR-3053 was used. This device measures the participants fine motor skills and coordination by recording changes in the participants response time in a randomized pattern test. First, the participants would test using the RU-Fit device, then they would complete a treatment in the BIMINI NanoJet system for 30 minutes. We conducted a test immediately after, then 1 to 2 hours after and then the next day.

Results

Based on Count Improved						Based On Mean SKG Difference			
	Rice Athletices					Rice Athletices			
Gender	% Improvement			#	Gender	SKG Change			#
	ID #	Left	Right	Treatments		Left	Right		Treatments
M	BLG-0410	20%	40%	5		-0.24	-0.02		5
M	DVM-9551	17%	17%	6		.0.57	-0.04		6
F	FEH-1722	67%	33%	3		0.06	0.05		3
M	JER-2151	0%	100%	1		-0.77	1.31		1
M	ZI5-5916	75%	38%	8		0.12	-0.06		8
				23					23
	WT AVE	43%	35%			-0.18	0.03		
	Non Rice Athletices					Non Rice Athletices			
	% Improvement			#		SKG Change			#
Gender	ID #	Left	Right	Treatments		Left	Right		Treatments
M	APQ-7731	0%	50%	2		-4.16	-0.17		2
F	SSI-4138	50%	0%	2		0.19	-2.5		2
F	XFH-4621	100%	0%	1		0.49	-0.4		1
M	GBH-7063	49%	59%	1		-1.59	-0.94		1
M	DNM-9551	29%	59%	1		0.31	-0.85		1
	WT AVE	46%	34%			-0.95	-0.97		

Figure 1: Overall testing results of improvement after treatment of the Bimini NanoJet System.

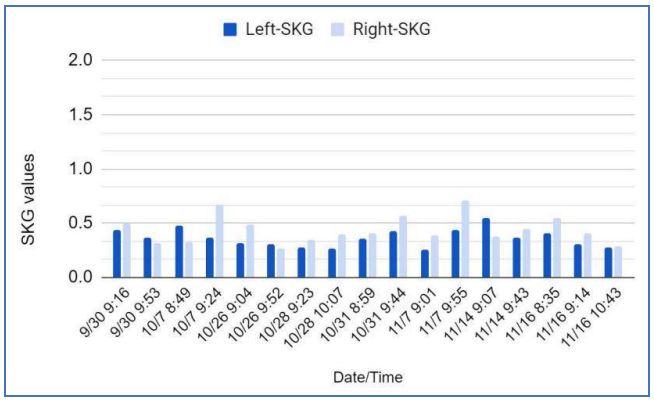


Figure 2: SKG score over time of Subject ZJS-5916

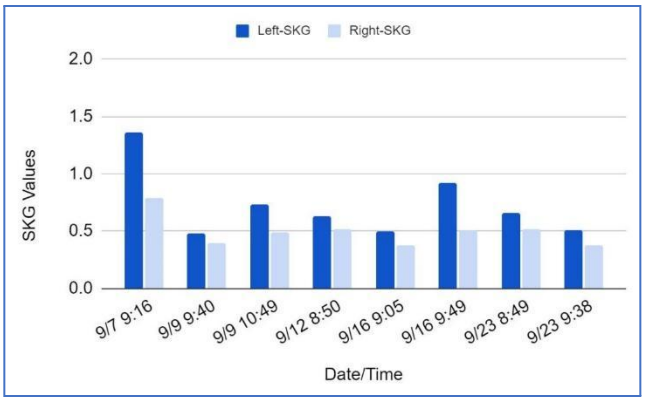


Figure 3: SKG score over time of Subject FEH-1722

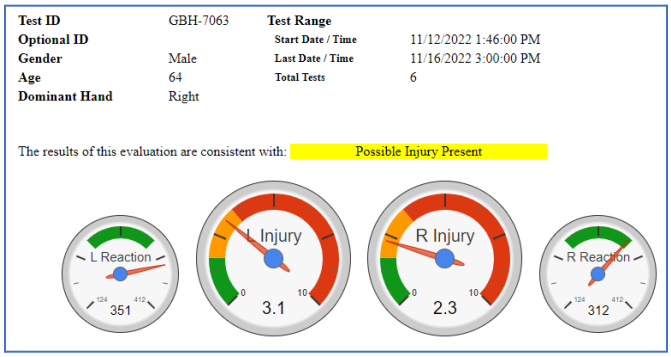


Figure 4: GBH-7063 with lower back pain prior to Bimini Treatment

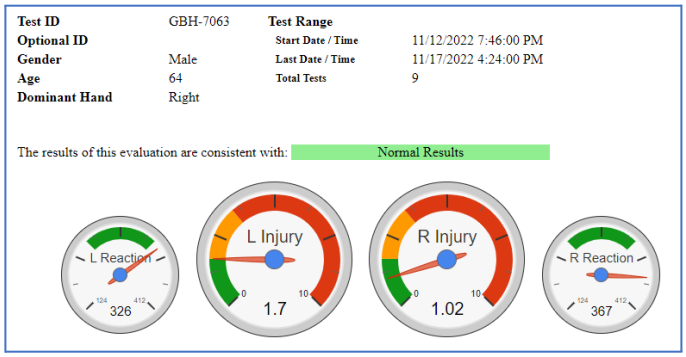


Figure 5: GBH-7063 next day after Bimini – No Pain

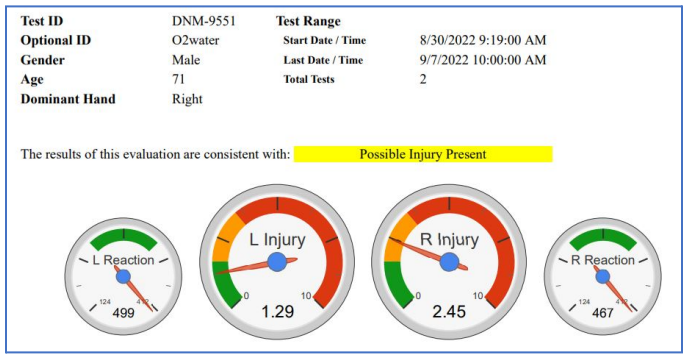


Figure 6: DNM-9551 Showing Possible Injury Prior to Bimini

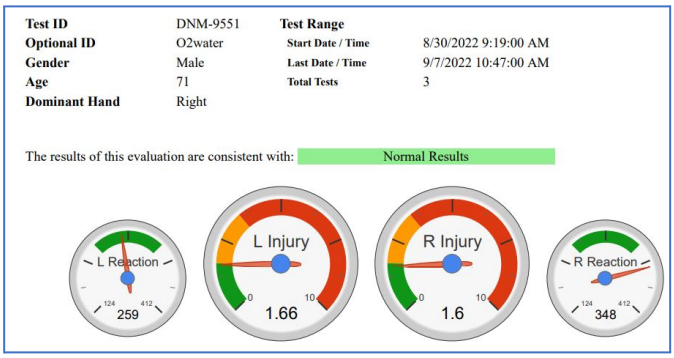


Figure 7: DNM-9551 Showing Normal directly after a 45-minute Bimini

As seen in **Figure 1**, improvements in the participants occurred at a rate of ~46%.

Participants in the study were able to show meaningful changes in their SKG score after using the BIMINI NanoJet system as seen in **Figure 2 & 3**. *Subject ZIS-5916*, a football player, showed steady improvement. With the continual head-on hits of their sport over the duration of the season, it was a promising trend that their scores remained positive.

As seen in **Figure 4 and 5**, a 64-year-old active male with lower back pain before and after Bimini NanoJet treatment. Great improvement the following day with no pain.

As seen in **Figure 6 and 7**, a 71-year-old-active male showed improvement immediately after Bimini NanoJet Treatment.

Another promising trend can be seen, in middle-aged participants, with no regular training in their schedule, improvement in their scores could be attributed to the BIMINI NanoJet Treatment.

Conclusion

The Bimini NanoJet perfusion system turns any body of water or Hydrotherapy whirlpool into an oxygen-rich oasis that perfuses oxygen through the skin and into the body's soft tissue. Our findings indicate that testing immediately after coming out of the tank has resulted in a marked feeling of relaxation / euphoria and mental clarity. More importantly, increased performance can be seen in the last three data points in **Figure 2**, where Subject Z demonstrated substantially better performance scores an hour after the tank when compared to immediately out of the tank. It is also noted that all participants claimed it increased muscle recovery drastically. Further testing has indicated that SKG scores improve at a higher rate after waiting 1-2 hours after coming out of the tub. Athletes have shown significant improvements in performance from 1 to 24 hours after a Bimini session. A 46% improvement rate is consequential and impressive.

Also noted after treating over 100 athletes over the past 6 months at Rice University there have been no adverse effects by sitting in the Bimini NanoJet oxygenated water, which leads us to believe there is no risk of oxygen toxicity. The conclusion of the studies and treatments using the Bimini NanoJet Perfusion System, which increases performance of the athlete, indicates improvement in muscle recovery and mental clarity.

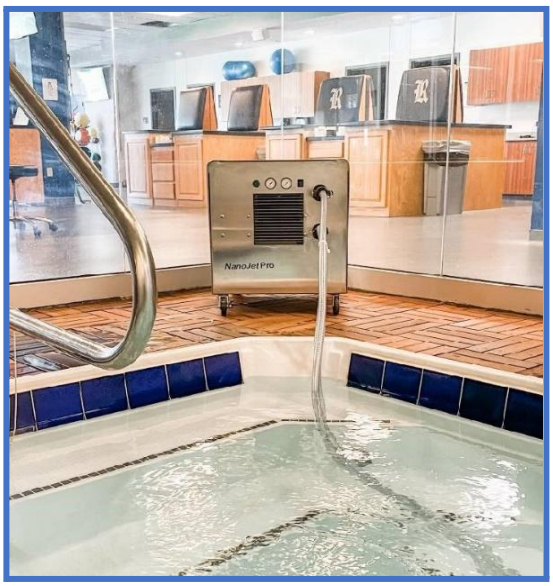
Regarding the athletes' reception of the Bimini NanoJet Oxygen Perfusion System, there is a lot of excitement. The athletes are recovering quicker and are seeing improvement in performance. The athletes leave the Bimini NanoJet experience very relaxed with mental clarity. Over 80% of the athletes who were consistently in the Cold Tub and with other recovery devices have switched over to the tub with the Bimini NanoJet System for recovery. The athletic trainers love the Bimini NanoJet System because it allows them to treat multiple athletes at one time. And because of the comfort of the treatments, the athletes are easily sold on the treatments.

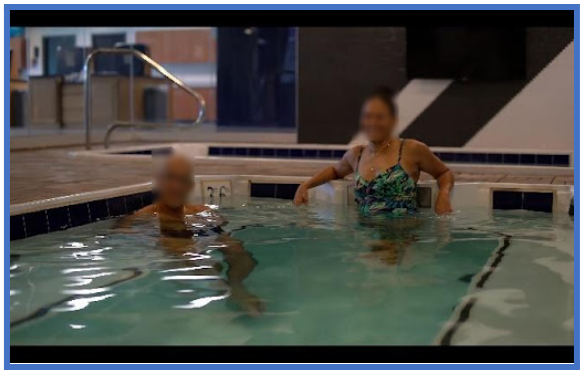
Acknowledgements

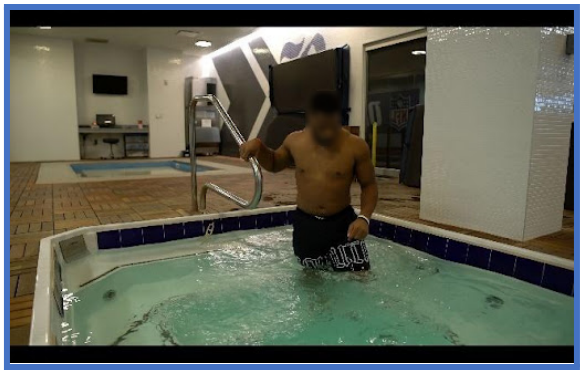
We would like to Thank the Rice Sports Medicine Trainers and the volunteer participants. Additionally, we would like to thank Red Oak Instruments for the use of their RU-FIT Model SR-3053.

Indexed Images

Bimini NanoJet Oxygen Perfusion System







RU-FIT Model SR-3053