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Removing Occupational Hazards for Healthcare Providers: The GLift PRO

CLD talks with Matthew B. O'Steen, MD.

The GLift PRO is a radiation protection system that transfers the weight from the lead apron off your shoulders, back and neck to your iliac crest through an established orthopedic principle called force transfer. It allows you to "bypass" your spinal column as essentially a weight transfer system. The GLift PRO was created to provide musculoskeletal relief while providing best-in-class radiation protection. The endo skeleton is built into the lead apron. I started using the GLift about a year ago. I have seen how people who have worked in the lab for years have experienced problems. Two of my partners have had multiple surgeries on their back. Other physicians that work in the lab have had back and neck surgeries. It is just a reality: if you wear the extra weight of a lead apron on your body for multiple hours a day, it is a risk factor for creating issues with your spine. The last thing I wanted to do is have back problems. I started thinking about trying the GLift, then started wearing it, and quickly became disciplined in its use. When I first started wearing the GLift, it took a little time get to get used to, similar to when you first wear lead. You get used to wearing it and after a couple cases, you don't even realize you have it on at all. Especially if you get into long cases, I can definitely tell a difference in my back afterwards when I wear the GLift. I don't feel tired. I don't feel I need to stretch out as much after long cases.

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Figure 1. Dr. O'Steen wearing the GLift PRO system (G-Tech, LLC).

Are you wearing the GLift PRO in every case?

I do wear it in every case. I have become very disciplined in wearing the GLift. If I do a case, even if I think it is going to be a short case, it takes about 30 seconds to put on the GLift. I have become committed. I plan on doing these procedures my whole career and I don't want to go out because I have a back or neck injury.

So you began wearing the GLift as a preventative measure, rather than first experiencing any musculoskeletal issues?

I am mid career, having been in private practice for 15 years. I wasn't experiencing any problems outside of what everyone undergoes from wearing lead all day. Occasionally, structural heart and high-risk percutaneous coronary intervention cases will go longer than expected. If you end up in a four-hour case then take your lead off, not only are you exhausted mentally at times, but you can feel it in your body. Occasionally, cases go longer than that. The constant of lead aprons brings a cumulative effect over time and I have seen my colleagues suffer problems as they became older. If you wear lead, you are carrying it on your shoulders and your shoulders are supported by your neck. That weight creates a chronic trauma to the spinal column. It makes sense to me to

Ergonomics-Related Research

Mayo Clinic Study: Occupational Hazards in Interventional Labs

In a case-controlled, multisite study by the Mayo Clinic, "Occupational Health Hazards of Working in the Interventional Laboratory"[1]:

- 55% of study respondents reported musculoskeletal pain (n=1543, with 1042 involved in procedures utilizing radiation);
- 62% of technologists and 60% of nurses versus 44% of the attending physicians in the Mayo Clinic study reported musculoskeletal pain, despite the technologists and nurses being younger and having worked for fewer years;
- Since the technologists and nursing staff do not typically rotate out of the interventional laboratory, they are exposed to more constant physical stress from lead apron usage.
- Studies have shown that chronic musculoskeletal pain increases with higher case volumes and more years in practice for physicians.

The Mayo Clinic study concluded:

"[M]usculoskeletal pain is more common in healthcare workers who participate in fluoroscopically guided interventional procedures and is the highest in nonphysician allied staff. Female sex, increasing time per week participating in procedures requiring radiation, and increasing use of the lead apron are associated with a higher prevalence of musculoskeletal pain."[1]

The Gravity-Longitudinal Individualized Force Transfer system, GLift, transfers the weight of a protective apron from the back and shoulders to the iliac crests. This weight transfer improves arm and neck mobility. More importantly, the neck is protected by the GLift from potentially dangerous posterior pressure from the weight of the protective apron during movement.

Reference

1. Orme NM, Rihal CS, Gulati R, et al. Occupational health hazards of working in the interventional laboratory: a multisite case control study of physicians and allied staff. *J Am Coll Cardiol*. 2015 Mar 3; 65(8): 820-826. doi: 10.1016/j.jacc.2014.11.056

transfer that weight and put it on my hips. It leaves my spine free to move. Wearing the GLift is preventative. I thought about it, was willing to try it, and now I have gotten to where I believe in it. One of my partners, who has had neck surgery multiple times, now wears it religiously.

How do you find the range of motion and balance when you have it on?

Balance is no issue. Range of motion is a minimal issue and that is what takes you a little time to get used to. There is a little different movement of your upper body within the lead system, but it is minimal. As far as the ergonomics of doing cases, there is no hindrance. While there is minimal difference in range of motion, you do have this support structure in your back.

What are some of the other things that you have seen people try before they have come to the GLift?

There are few things that I personally have never used. One is a lead shielding device that is basically suspended from the ceiling. That is a capital investment that our hospital hasn't been willing or able to invest in. There is also a device that is called Rampart where nobody in the room supposedly has to wear lead. It protects or controls the radiation escaping the patient. Again, that is a bigger capital investment. The GLift fit into our hospital budget to purchase.

Do you store the GLift with your lead aprons?

I used to store my lead on the standard hook and I either put the GLift in my locker or it can hang on a lead rack. Now that the GLift PRO is a complete system, I can just hang it on the apron rack like standard lead aprons.

Any final thoughts?

The company continues to innovate and develop solutions for the healthcare provider. I have seen the pipeline of technology and there is a system being planned already after the GLift PRO. It will have articulating pieces in the support structure and the lead is also going to be incorporated into the system. I tried out a prototype and provided feedback to the people developing it, and I am excited for the future.

It is encouraging that we have seen a pivot in recent years toward protecting the people that are operating and doing these procedures. We have always worried about radiation safety and lead protection, but we didn't think enough about how to prevent musculoskeletal injuries. I like that there are now multiple innovations coming out that are designed to protect the people who are taking care of patients. The concept of personal protective equipment (PPE), which is mainly what we've seen in COVID to protect against droplet transmission of virus particles, has now become mainstream. But PPE is a broad term that includes hard hats for people working in construction. And it is the same thing for us. It is about protecting our bodies, not just from an infection, but from injury caused by everyday work and ergonomic issues. ■

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Read more about the GLift in *Cath Lab Digest*:

***CLD* February 2021**
Redistribution of Radiation Protective Apron Weight for Musculoskeletal Health, Fatigue, and Improved Ergonomics: The G-Lift
CLD talks with W. Lance Lewis, MD, FACC, FSCAI.
tinyurl.com/G-LIFTLewis

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