SCI News

A publication by the Spinal Cord Injury Program at Mary Free Bed Rehabilitation Hospital. **Issue #4; Fall/Winter 2007**

Brandi Balkema's modified truck with hand controls lets her drive independently to get to her job, to her Mary Free Bed appointments, to wherever she wants to go.

Mary Free Bed's Driver Rehabilitation Program Gets Patients on the Road Again

For years, the Driver Rehabilitation Program at Mary Free Bed Rehabilitation Hospital has been putting people with spinal cord injuries back in the driver's seat. For many, the Driver Rehab Program is one of the last services they use at Mary Free Bed, but returning to driving is often the most significant activity that restores freedom and independence.

The program, headed by Jerry Bouman, evaluates peoples' skills and provides driver education and rehabilitation. Jerry and his staff also help people who are buying a modified car or truck with adaptive equipment by providing recommendations and training, as needed. Once the modifications to the vehicle are complete and the individual has successfully finished training, it's time to hit the road independently.

Brandi Balkema, a former MFB Spinal Cord Injury Program inpatient and current outpatient, sustained her injury in a 2006 car accident. Young and active, Brandi was anxious to return to driving. "Before my truck was ready, I had to rely on a service to get places, which is very restricting," Brandi said. "I live out in Gowen and I could only use the service to go places my insurance would cover. Or, I would have to rely on others to take me places. It's demeaning to have to have people drop you off places." Brandi now has a truck with an interior wheelchair lift and hand controls and drives independently to get to her job, to get to her Mary Free Bed appointments, to get to where ever she wants to go.

A Little History

Modifications that allow people with spinal cord injuries to drive have been available for years, but recent changes and improvements in adaptive equipment now allow those with SCI to use a variety of base vehicles for transportation and driving. It used to be that individuals were limited to driving only sedans, minivans, or full-size vans. Now, in addition those vehicles, truck and SUV modifications are available. Also available are safety improvements for those who drive with hand controls.

In the past, a patient who used a truck for a base vehicle was requires to pull him or herself up and into the truck from the wheelchair seat. Transferring this way required climbing up 10 to 13 inches to get into the truck's seat. Additionally, people loaded and unloaded wheelchairs manually. After years of doing this, the demands of the transfer and wheelchair loading typically resulted in problems with upper extremities and shoulders.

New and Improved

Now, truck modifications provide a transfer seat for a driver to transfer onto at wheelchair-seat level. Two seat styles are currently available. One style provides a platform to transfer onto; once on the platform, the platform rises to the level of the truck's seat and the driver slides into the factory truck seat from the power seat platform. Once seated in the driver's seat, the driver removes the seat platform and closes the door. The second style of seat modification actually brings the driver's seat out of the driver's door and down to a

continued on next page

Restoring Hope and Freedom
Mary Free Bed
Rehabilitation Hospital

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Sitting on her transfer seat, Brandi Balkema, Mary Free Bed SCI Program patient, loads her folding wheelchair into her extended cab truck.

height that someone in a wheelchair can transfer onto; the seat then powers up to floor level and swings back into the driver's position. Both seat modifications eliminate the need for the driver to pull him or herself up from the wheelchair, into the cab, and onto the driver's seat, which greatly decreases the amount of effort that is required to get into a truck seat.

Coupling the seat modifications with a power wheelchair loading device allows drivers to easily manage wheelchair loading and unloading. A loader that is mounted in the bed of the truck can pick up a rigid frame wheelchair and store it. Truck bed cap modifications are available so the wheelchair is covered during transport. Folding wheelchairs can be managed using the same equipment; or, if a person wants to keep the bed of the truck open, a loading device can be mounted inside the cab.

Try Before You Buy

Driver Rehab staff always recommend that someone try out modifications before they are made to a personal vehicle, especially since there are specific truck requirements for modifications. Both styles of seat modifications require an extended cab. Interior truck cab wheelchair loaders with a folding wheelchair require an extended cab with a third door. To ensure that the driver, the wheelchair, the modifications, and the desired truck are compatible, it's imperative that he or she try out all the adaptive equipment and work with a qualified vendor before buying a truck.

Ready, Set, Control

Hand controls are an extension of the factory pedals that operate the vehicle's accelerator and brake. When using hand controls, the factory brake pedal moves when applying the brakes. Most drivers who use hand controls are aware of the danger of having their lower extremity positioned below the brake or gas pedal as their lower extremities may prevent the brakes or gas from being applied. However, there have been some accidents as a result of the driver's foot interfering with applying the brakes. To prevent this from happening, a pedal guard was designed, which is removable and allows able-bodied drivers to use the factory pedals. Driver Rehab staff recommend a pedal guard for all drivers who use hand controls. While the pedal guard increases the overall cost for modifying a vehicle, it also increases the overall safety for all drivers on the road.

Another item drivers often use with van, truck, and SUV hand-controls is a chest strap with Velcro closure. In a sedan, a driver's lower extremities tend to be positioned out in front of him or her, which helps with stability. Minivans, trucks, and SUV seats allow for more upright sitting thereby decreasing a driver's stability in the seat. The chest strap helps keep the driver upright when taking faster turns or executing evasive maneuvers and helps the driver better manage the hand controls and steering device.

"Driving with hand controls isn't exactly like using your feet," Jerry said, "But when I talk with patients who have a thousand miles with hand controls under their belts, it's not uncommon to hear them say, 'I can't remember what it was like to drive with my feet!'"

To have hand controls installed in a vehicle, an individual must:

1. **Participate in an evaluation** - This is an opportunity to try the adaptive equipment on the road and determine if it meets the person's needs.
2. **Complete training** - Training is provided to ensure safety with the adaptive equipment. Training sessions also allow someone to try other styles of hand controls to determine what works best. Training is recommended to prepare for and pass a road test with the State of Michigan (Driver Assessment).
3. **Complete a road test with Driver Assessment** - The adaptive equipment is noted on the driving record, allowing the driver to have the equipment installed on his or her own vehicle, or allowing for rental of a car equipped with adaptive equipment.
4. **Follow up with Driver Rehab once modifications are made to the vehicle** - A Driver Rehab staff member meets with each person when his or her vehicle is ready for delivery. The staff member will ride with the driver to ensure that the equipment is properly adjusted and that it meets his or her needs.

On the Road Again

"Returning to independent driving provides a huge amount of freedom," Jerry said. "I've had former clients say that after returning to independent driving, they felt they finally had their life back. The base vehicle and the adaptive equipment have to work for an individual. There is no one perfect vehicle or perfect hand control that works for every person in every situation. To be a solution to the driving question, the vehicle and the equipment have to make sense to the driver, or it really is no solution at all. The goal for the Driver Rehab staff is to help clients find that solution."

"When you're an inpatient at Mary Free Bed all you hear is independence, independence, independence – no one does anything for you if you can do it yourself" Brandi said. "But, it's hard to be independent in the real world. Mostly, people want to help you. But with my truck I can go places alone. I can buy groceries, go to the mall, go to work. Getting around on my own, driving independently, shows people that I am independent, that I don't need help."

Driver Rehab helps a variety of clients

In addition to working with people with spinal cord injuries, the Driver Rehab Program works with:

- Older drivers who are experiencing difficulty with driving skills, such as reaction time; who have vision problems; or who are suffering from a degenerative disease that affects their ability to drive
- New drivers who may have a disability or limited mobility that prevents them from enrolling in other driver's education courses and who need to learn to operate modified vehicles.
- Experienced drivers who have incurred a head injury or stroke and require an assessment of visual, perceptual, and cognitive skills related to driving.
- Drivers in need of vehicle modification due to an accident or illness and who may need retraining.

To access Mary Free Bed's Driver Rehabilitation services, an individual must first have his or her condition evaluated by a physician who writes a prescription requesting a driving or transportation assessment. Driver Rehabilitation advises the individual and his or her physician about their overall driver safety and readiness to drive – the Driver Rehab Program does not have the ability to grant or remove an individual's license. ■

For more information about Mary Free Bed's Driver Rehab Program, please call 616.242.0343 or 800.528.8989; the program can also be contacted via email at driverrehab@maryfreebed.com.

Ask the Doctor

By Sam Ho, MD
Spinal Cord Injury Program
Medical Director

In September, Mary Free Bed Rehabilitation Hospital adopted a smoke-free policy that ensures patients, visitors, and staff have an environment free of tobacco use and exposure to second-hand smoke. As a leader in rehabilitation medicine, Mary Free Bed recognizes that this public health issue extends beyond individuals' personal health choices – smoking and tobacco use have grave health ramifications and impacts the health of family members, friends, and co-workers.

Why is it important to stop smoking after I have a spinal cord injury?

After your spinal cord injury, your body is doing all it can to heal, and if you smoke you're not giving yourself every possible opportunity for optimal recovery. Surgeons have documented that smoking interferes with your body's healing efforts. Smoking produces carbon monoxide, which diminishes the amount of oxygen in the bloodstream used to nourish tissues and power muscles. This decreased concentration of oxygen in the blood is the greatest threat to healing.

Depending on the level of your spinal cord injury, your respiratory system may be gravely compromised. Muscle function that helps with breathing and coughing is sometimes impaired or it might be absent altogether. Individuals with SCI, and especially those with higher-level injuries, are at greater risk for increased congestion and respiratory infections. If you add smoking to that risk, SCI survivors significantly increase their odds of acquiring a serious upper-respiratory infection.

Why are smokers with spinal cord injuries at higher risk for heart disease, cancer, and other health problems?

Research shows links between smoking and various health problems grow stronger by the day. People with SCI have many factors working against them. Immobility and inactivity associated with SCI contributes to loss of muscle mass due to atrophy below the level of spinal cord injury, increased fat to muscle ratio, weight gain, poor circulation, and difficulty

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maintaining cardiovascular or aerobic fitness. Studies demonstrate that individuals with SCI who were less fit on cardiovascular tests were more likely to be insulin resistant. This condition affects the body's ability to use blood sugar normally and can lead to metabolic and blood pressure abnormalities. Smoking further constricts blood vessels, making it harder for blood, oxygen, and nutrients to flow to the body's organs and tissues, causing infections and diseases and increasing the likelihood of developing pressure sores. And not only is the risk for bladder cancer higher among SCI survivors who use indwelling catheters, but the risk also increases with smoking because cancer-causing agents may be carried in the urine.

In addition to smoking, what other factors contribute to breathing and respiratory problems among those with SCI?

As we age, we all lose elasticity in our lungs and in the muscles of the chest wall. These changes decrease both breathing capacity and lung volume, making it harder for the body to fight off infections. With SCI there are other potential concerns:

- Increased weight, which usually makes breathing more difficult
- General decrease in exercise leading to decreased breathing capacity
- Smaller lung capacity due to posture problems such as rounded shoulders or slouching
- A change in the type or severity of spasticity that affects the chest or breathing muscles
- Increased number and severity of respiratory infections due to diminished ability to cough

All these changes place SCI survivors at higher risk for respiratory problems as they age. Smoking not only multiplies the problems, but also increases the risks.

How does smoking affect the respiratory system of a spinal cord injured person?

With SCI, and especially with SCI and smoking, getting air out of the lungs can sometimes be even more important than getting air in. A build up of mucus and various secretions in the lungs can lead to problems. Smoking increases the production of mucus and contributes to congestion. Normally, these secretions get coughed out. However, the muscles responsible for coughing are affected by cervical injuries, and to a varying degree by thoracic injuries. An impaired ability to cough frequently leads to atelectasis, a collapse of the honeycomb-like air sacs that often causes secretions to become trapped in the lungs. These secretions build up and may lead to pneumonia, one the most common causes of both sickness and death in those with SCI.

How does smoking contribute to the development of pressure sores?

According to the Spinal Injury Resource Center, studies link smoking to an increased incidence of pressure sores as well as longer healing time for both sores and the skin surgery that is sometimes necessary to repair them.

Research has found that healthy skin needs good circulation of highly-oxygenated blood to carry nutrients and remove waste products. Smoking and nicotine cause decreased blood flow to the extremities. Smoking also produces carbon monoxide, which severely impairs oxygen from even entering the blood. In other words, not only does smoking cause less blood to get to skin cells, but the blood that does get there has far less oxygen. A decrease of oxygenated blood and nutrients to the skin, as well as insufficient removal of waste products, leads to skin breakdown and the development of pressure sores.

Once skin sores develop, this same impaired circulation with less oxygenated blood slows the healing process. In fact, this decreased concentration of oxygen in blood is the greatest threat to wound healing.

Other than not smoking or using tobacco, what are some strategies to stay healthy?

Health strategies for people with spinal cord injuries are the same as for those without an injury: eat a sensible diet, avoid excessive alcohol use, maintain a healthy weight, and exercise regularly. **If you'd like to stop smoking but need help, be sure to talk to your health care provider or call Amy Arends, our Spinal Cord Injury Program Nurse Care Coordinator, at 616.242.9216 or 800.528.8989.** ■

Program Staff

Amie Dlouhy, RN, BSN, Patient Care Director, Spinal Cord Injury and Brain Injury Programs

Sam Ho, MD, Medical Director, Spinal Cord Injury Program

Bill Sonday, MSW, ACSW, Director, Inpatient Therapy Programs

Jackie Wondolowski, MSW, Manager, Spinal Cord Injury Program

Event Calendar

- **Adapted Downhill Ski Clinic**
  Cannonsburg Ski Resort – Saturday, February 2, 2008
- **Adapted Rock Climbing Clinic**
  Grand Valley State University – Saturday, March 8, 2008
  For more information on either of these programs, please call 616.356.1861 or visit www.maryfreebed.com.
- **SCI Support Group Meetings**
  Mary Free Bed's Inpatient Building, 235 Wealthy SE
  2nd Floor Conference Room / 6:00 pm – 7:30 pm
  - No meeting in December
  - January 28, February 25, March 24, April 28, 2008
  For more information, please call 616.242.0443 or visit www.maryfreebed.com.
- **2008 SCI Symposium**
  Crowne Plaza of Grand Rapids
  Friday, September 19, 2008
  Look for more details in the next edition of SCI News and on our web site at www.maryfreebed.com.

Staff News

We couldn't do it without you!

The SCI Program PT team – **Mark Grab, Amy Korn, Tim Lesch, Jackie Madsen, Laurie Mustapha, Tracy Oostema, and Kristy Simpson** – extends a big "thank you" to all of the SCI patients who participated in our various teaching modules this past year. Our PT staff regularly provide instruction on spinal cord injury (lectures and hands-on labs) for students enrolled in the doctorate in physical therapy (DPT) programs at Andrews University and Grand Valley State University. Your participation allowed students to gain much-needed experience in working with "real patients." We received very positive feedback from the DPT students regarding their interactions with you.

Welcome new Mary Free Bed staff!

Kendall Kuzma Lisenbee, RN, joined the SCI and Brain Injury Program teams on April 10, 2007. Kendall graduated from GRCC with an associate's degree and looks forward to returning to school part-time to work toward a master's degree in nursing. On September 8, 2007, she married Nate and is now officially Kendall Lisenbee.

Kelly Merz, CTRS, recently joined the SCI Program. Kelly has been a recreational therapist at MFB for more than 11 years. During that time, she provided ongoing coverage and peer support for SCI patients, coordinated and staffed multiple adapted sports clinics and assisted with the coordination of the Fifth Third River Bank Run – Wheelchair Division. She has also served as co-leader of Mary Free Bed's monthly SCI support groups. Kelly graduated from GVSU with a bachelor's degree with an emphasis in therapeutic recreation. She and her husband, Scott, are proud parents of 3-year-old daughter Abrial, and are the process of building a barrier-free home. Kelly's additional interests include kayaking, rock climbing, camping, handcycling and scrap booking.

Trudi Preslar began working as a department secretary at MFB in June, 2007. Trudi is the primary secretarial support person for the SCI Program. She graduated in June, 2007 from GRCC with an associate's degree in medical and executive administration. Trudi is married to Benny and has an 11-year-old son, Glen. She enjoys being outside, camping, canoeing, biking, reading and spending time with her family.

Brianne Taylor, CTRS, has been a recreational therapist for three years. During this time, she worked part-time in outpatient therapy at MFB, and additionally provided inpatient coverage. She also worked part-time at Metro Health Hospital on their rehabilitation unit. Brianne has helped with multiple MFB adaptive sports clinics and is looking forward to working closely with Kelly Merz on the Fifth Third River Bank Run. Brianne is a graduate of GVSU and has a bachelor's of science degree with an emphasis in therapeutic recreation. She has also received credentialing through the American Red Cross as a water safety instructor. Brianne, married to her husband, Burton, lives in Grand Haven. Her interests include running, shopping, social time with friends, yard work, swimming, bike riding and book clubs. She also finds time on the weekends to work at her favorite local jewelry store (for great discounts, of course!)

Dawn VanHoven, COTA, began working at Mary Free Bed in October, 2007. Dawn graduated in May, 2007 from GRCC with her occupational therapy assistant degree and completed a student internship with Mary Free Bed's SCI Program. Dawn is married to Dan and has two grown daughters, Tara and Brooke, and a 13-year-old son, Tyler. She enjoys the outdoors, running, biking, working in the yard and road trips with her family.

Jeremy Walker, Rehab Tech, joined the SCI Program's Intense Therapy for Motor Recovery team in July, 2007. Jeremy graduated from Aquinas College in May, 2007 and is taking additional classes while applying to medical school. Jeremy's hobbies include hiking, skiing, reading and spending time with family and friends.

Babies are born!

Laurie Elgersma, RN, TPE, gave birth to Maggie Jeanette, October 4, 2007. *6 lbs, 3 oz, 18 inches*.

Brenda Felker, RN, welcomed Brandon Aaron on August 11, 2007. *6 lbs, 3 oz, 17.5 inches.*

Jackie Madsen, PT, delivered Jorgen Christian on March 2, 2007. *6 lbs, 2 oz, 19 inches.*

Jenny Ponstein, RN, gave birth to Keirah Leigh on April 2, 2007. *6 lbs, 12 oz, 19 inches.*

Wedding Bells!

Ashley (Parsh) Wagner, Nurse Tech, and Robert Wagner were married on August 4, 2007. Congratulations on your nuptials!

Alumni News

Katherine "Katie" Korn Brown (1993) reports that after leaving MFB in 1993, she was able to return home and graduate with her high school class on time in 1996. After graduation, she went to New Orleans for additional therapy, fell in love with the city, and stayed for two years. She moved back to Michigan to be closer to her family. Six years ago, Katie met her husband and married in August, 2006 at a "beautiful wedding" in New Orleans. Katie spends most of her time working out and trying to stay fit. She has found a love of water skiing and spends her summers doing that on Murray Lake in Lowell. She has also found her way back to horseback riding, something she did not think was possible after her accident. Katie says, "I am so thankful for the people out there who have thought outside the box to make so many sports available for people in chairs." Katie and her husband also love to travel as much as possible and had a wonderful trip to New Zealand last year. They are looking forward to a trip to Australia next summer.

Joshua Buck (2007) and his new baby, Ephram, is one of four MFB patients featured in the new 2007 advertising campaign. Josh and Ephram are in a TV commercial as well as a print ad. The Bucks recently announced that several Grand Rapids churches have come together to buy land for them and build them a new fully accessible house! You can read Shelly Buck's blog at www.greenhouseministries.org.

Shelly Loose (1987), Ms. Wheelchair Michigan 2007, extends a big "thank you" to all those who supported her participation in the national pageant in Washington, DC, this past July. Though she reports that she "did not win it all," she felt the experience was "incredible, life-changing, and empowering!" As of September, Shelly has made nearly 30 appearances including TV, magazine, and newspaper interviews and school and hospital visits; traveled more than 3,900 miles; and talked with over 2,800 people. She also made parade appearances in front of more than 415,000 people. In August, Shelly and her daughter, Katherine, made a commercial for Right to Life. After the pageant, Shelly was named state coordinator for Ms. Wheelchair Michigan (www.mswheelchairmichigan.org). The next pageant will be held in March, 2008 in the greater Grand Rapids area.

Chris Townshend (2007) happily reports that he became engaged to Nicole Krupp on September 16, 2007. Congratulations and best wishes to Chris and Nicole!

Homer Shrader (2003) and his wife, Judy, were featured in an article entitled *Invisible Heroes: Caregivers* in the March, 2007 edition of *BE Healthy*, a publication of *The Grand Rapids Press*. Homer also commented on his experience with his Baclofen pump and Parastep technology in the article *High Tech Happiness*.

Ryan Williams (2002) graduated on May 4, 2007 with a doctorate degree from Ferris State University, College of Pharmacy. He started a residency program at Munson Hospital in Traverse City in July. Congratulations and happy graduation, Ryan!

Stay in Touch

Send your personal news and updates to:
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Breck Lonier (1999), now 44, sustained a life-changing spinal cord injury after falling from a tree stand. Breck reports he was devastated – physically, emotionally, in just about every way possible. During two months of treatment at Mary Free Bed, however, his outlook gradually began to shift.

"At first, I thought of all the things I couldn't do," said Breck, a manufacturing manager in Lansing. "But things started to change for me once I decided to focus on what I wanted to do – and resolved to figure out a different way to make them happen." His first order of business was to start hunting again. "Bow hunting is a sport I'm passionate about," Breck said. "I grew up in the country and love the outdoors. I was determined to find a way to continue enjoying the sport I've loved since I was 12."

Using equal doses of determination and creativity, Breck drew on his knowledge of steel fabrication to adapt old hunting techniques to his new circumstances. First, he crafted a custom bow mount for his wheelchair. Next, he designed a 48-square-foot insulated hunting shanty with a wheelchair ramp. Finally, Breck converted a golf cart that could navigate the rough terrain back and forth between his shanty and his truck. The hunting shanty was Breck's real breakthrough. He ran pulleys to windows all around so he could open any of them from his wheelchair with minimal movement and sound. Breck eventually built shanties in his two favorite hunting spots – one near Ionia, another in Michigan's thumb region. "The shanties have worked so well that I've even built them for family members who aren't in a wheelchair," Breck said.

Following his two months at Mary Free Bed and another two months of rehabilitation at home, Breck drove himself back to his job as manager for fabrication at Roberts Sinto, a maker of foundry machinery in Lansing. He also stays active mentoring other hunting accident survivors at Mary Free Bed, creating wood-burning art in the winter, and raising his 12-year-old son. Breck's educational video, *Wait Until Tomorrow*, shows how he performs various activities of daily living, and was done in collaboration with Western Michigan University occupational therapy students and Mary Free Bed's Spinal Cord Injury Program. The video is regularly used as a teaching tool by MFB therapists with newly-injured patients.

"After the accident, life was pretty depressing," Breck admits. "On bad days, I'd tell myself 'just wait until tomorrow.' You know what I learned? Inevitably, things really did look a little better by the next day."

New Technology

Technology Helps SCI Patients Regain Movement

Mary Free Bed (MFB) recently introduced to its patients groundbreaking technology to help those with limited function in the arm, hand, lower leg and foot regain movement. Designed by Bioness, the H200 and L300 are neuroprosthetics and rehabilitation systems that provide functional electrical stimulation to impaired extremities.

The H200 device, which consists of a wrist and hand orthosis with five built-in electrodes in the splint and control box, generates six different modes of phased patterned stimulation: three therapeutic exercise and muscle conditioning patterns and three patterns for functional activities such as opening and closing the hand, grasps and key grip. "With this device, patients can shake hands, grasp a beverage and perform handwriting tasks," Ashley Larimer, OT, said." Before we had these devices, clinicians used isolated electrical stimulation. What's great about the H200 is that patients receive stimulation on the top and bottom of the wrist and hand at the same time, which allows for better hand and arm function. Many patients need to re-learn voluntary movement control, and the main goal of this therapy is to maximize quality of life by improving independence in activities of daily living and restoring as much functional use as soon as possible."

The NESS L300 is a low-profile device worn on the lower leg and foot and enables easier, more natural walking. In addition to facilitating a more fluid gait, the NESS L300 may also stimulate muscle re-education, prevent or retard disuse atrophy, maintain or increase joint range of motion and increase blood flow. The device not only helps patients walk smoother, but also faster. It also has a built-in sensor that recognizes walking surfaces and adjusts accordingly. The compact design even allows patients to wear their normal footwear.

According to Tim Lesch, PT, the Ness L300 offers appropriate patients an alternative to wearing an AFO. "The device can be used as a therapeutic tool or purchased for individual use. MFB physical therapists trained in use of the L300 are excited with the results we've seen so far." MFB is one of two facilities in West Michigan to offer this therapy. We are also using the Bioness devices for patients recovering from stroke and brain injury and for those with disorders of the central nervous system.

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