

INSIDE MossRehab



Alberto Esquenazi, MD
Chief Medical Officer, MossRehab

CHAIRMAN'S MESSAGE

This issue of *Inside MossRehab* showcases our amputation program, an area in which I serve as clinical director. I am thrilled to share with you the status of the program and some of its accomplishments in clinical care, education, research and advocacy. We also reflect back on the program's origins with an interview with Robert (Skip) Meier, MD, from his time at MossRehab some 40 years ago.

I am particularly proud of the clinical team that works in this program—therapists, nurses, prosthetists, social workers, psychologists and physiatrists—who have developed significant experience and a level of quality in the care they provide that is, in my perception, difficult to match.

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New Prosthetics are Changing Patient Therapy

Matching the right prosthetic device to the right patient has always been of critical importance at MossRehab, according to Alberto Esquenazi, MD, chief medical officer. And with new technologies, patients are able to do more with less effort in a safer way than ever before.

“These new devices really improve patients’ functional capacity but they also increase the challenges of rehabilitation,” says Dr. Esquenazi. “In the upper limb, electronics have been implemented that allow the patient to use fewer sources of control signals for a more complex device. In the past, these upper limb prosthetics were very rudimentary—you had one type of grip, a pinch, and very little control of its position, intensity or speed. They evolved to offer more degrees of freedom but still lacked proper control. Now, we can use tricks in the electronic system to command these actions, using multiple muscles or grading the amount of muscle contraction.”

Andreas Kannenberg, PhD, executive medical director of Ottobock North America, says there are two exciting developments in upper limb technology. One is improvement in the functionality of prosthetic hands through introduction of the lateral grip (key grip), which researchers believe is used in up to 80 percent of grasping activities.

“It would be nice to access 40 grip types, as some of these hands have the capacity to offer, but with current mechanisms, control is too cumbersome,” says Dr. Kannenberg.

The second development is improvement of these control mechanisms.

“There is an intriguing technique which requires surgery,” says Dr. Kannenberg. “It’s targeted muscle reinnervation for patients with high level arm amputation. The surgeon cuts nerves that usually supply the pectoralis muscle and transfers nerve trunks from the residual limb into that chest muscle. The nerves grow into the pectoral muscle, creating several muscle sections that allow patients to activate their upper limb prosthesis using them.”

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MossRehab patient with leg amputation works on balance while using prostheses.

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This technique is already used in a small number of people in the United States, says Dr. Kannenberg, and patients have been able to open and close the hand, move a finger, and manage several other signals for simultaneous control of the prosthetic wrist, hand and elbow.

In lower limb technology, microprocessor-powered knees and ankles and passive prosthetic knees have begun to offer patients the ability to safely and intuitively walk up stairs or inclines.

“These sophisticated control mechanisms and devices are allowing patients to function in ways they couldn’t in the past,” says Dr. Esquenazi. “In the lower limb, we have electronics that can slow down or speed up the movement of the ankle or knee and provide assurance that the knee won’t buckle during walking on uneven terrains, which used to happen with mechanical devices. It’s really important that patients have control over these devices. You wouldn’t want an automatic leg. You want it to do what you want to do, just as with the grip strength and speed for the upper limb.”

Tailored Treatment

These new devices require an individualized therapeutic approach from clinicians involved in a patient’s rehabilitation.

“The new technologies require that you understand how they work, what specific features they have and how you can train your patient to take full advantage of functions of their particular prosthetic components,” says MossRehab physical therapist Maria Lucas, PT, DPT, amputation program coordinator. “Therapists must keep up to date on new features and abilities. The way I would teach a person with one type of limb to walk down steps is different with a different prosthetic knee.”

As these technologies are improving, Lucas says therapist and patient education are key to achieving the best outcomes.

“We can rely on our colleagues, specifically the prosthetists and prosthetic manufacturers, to help us understand the latest features of these devices,” says Lucas. “Once we know how it functions, we can teach our patient to take advantage of it.”

Lucas says that while technology is a wonderful thing, it’s not the answer to every obstacle people with amputation face.

“They still need to have range of motion, strength, coordination, endurance, cognition and balance to get the benefits from these technologies,” says Lucas. “There is an increasing need for all clinicians to understand what particular groups of patients’ problems can be solved with technology and what types of problems require a therapeutic approach. Technology is only part of the process of rehabilitation.”

Achieving the Right Fit Can Be a Challenge

Both Lucas and Dr. Esquenazi say one of the biggest challenges surrounding these new prostheses is the hype caused by the news media and the internet.

“We see young, very fit, healthy patients doing amazing things with the technology available to them, and that’s great,” says Lucas. “But most people who lose limbs do so because of chronic diseases. While I fully believe technology also helps people with amputation due to disease, technology alone is not the answer to getting them back to function and a rewarding lifestyle. They need psychological support, therapy and training provided by a highly experienced staff like the one at MossRehab, where we deal with several hundred new patients a year.”

Dr. Esquenazi says it’s critical to match a patient’s device to his or her reality.

“We need to be careful not to under- or over-prescribe,” says Dr. Esquenazi. “It’s most important to consider the functional level of a patient and if a certain device can provide additional function and safety. Patients want what they see on TV, but we need to explain why we’re opting for something different. We also need to support the medical necessity for the device we prescribe or insurance won’t cover it.”

Dr. Esquenazi explains that prostheses—especially the newest and most advanced versions—are more costly, and patients often experience sticker shock when they find out what insurance will cover and what the balance is that they’ll need to pay.

Prostheses in the Pipeline

Andreas Kannenberg, PhD, executive medical director of Ottobock North America, says there are several prosthetic technologies in development right now, some of which may be commercially available in the next few years and others that are likely still more than a decade away.

- **Exoskeletons:** “These are completely powered, and I hesitate to call them orthoses because they’re a completely new type of device,” says Dr. Kannenberg. “They were mainly developed for the military to support soldiers traveling long distances and carrying heavy loads, but they have been modified to serve patients with paralysis or paresis of the leg muscles.” ReWalk which was tested and first introduced to clinical use in the U.S. by MossRehab is an example of this category of devices

While these exoskeletons could have potential value in the inpatient rehabilitation setting—getting patients into an upright position and walking—practicality for daily life or the home environment is still being developed. Dr. Kannenberg says further research and development is needed to make the devices safer and more manageable.

- **EMG-Controlled Lower Limb Prostheses:** According to Dr. Kannenberg, a few groups have been working on improving control of lower limb devices by deriving EMG signals from the residual limb.

“For passive prosthetic components, EMG control is not really necessary because walking is a highly automated process you can mimic with current technology,” he says. “But this EMG control may help with powered prostheses when a patient tries to walk upstairs or on an incline.”

“It is my responsibility, as their physiatrist, to prescribe the right device for the patient and stand behind this medical decision,” he says. “This comes from a team approach that includes the prosthetist, therapists, physician and patient.”

And that team must consider other elements beyond the devices.

“As these prostheses become more sophisticated, they require batteries and electronics,” he says. “One of the major concerns is that, with this, they get heavier and more difficult for the patient to carry. We need to make sure a patient’s device is as comfortable and functional as possible while still matching up with his or her demands.”

- **Pattern Recognition:** Instead of limiting signal input to two channels, researchers are looking to use an array of electrodes to recognize and predict the functional intent of muscles in the residual limb.

“This is very promising, and it may help patients to use functions of different prosthetic components simultaneously instead of in a sequential pattern,” says Dr. Kannenberg.

Researchers are also looking at implantable electrodes that would transmit EMG signals wirelessly and respond to pattern recognition—coordination between muscles that would predict what activity the patient wants to perform.

- **Sensory Feedback:** Dr. Kannenberg says several groups are working on implementing sensory feedback into upper limb prostheses through pressure or direct nerve interfaces.

- **Brain-Computer Interface Prostheses:** Research of technology that would enable patients to control prostheses through thought—while exciting—is years from creating a commercially available product, says Dr. Kannenberg.

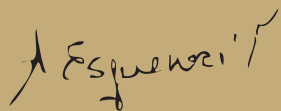
“The very important point to consider is who is going to pay for these technologies,” he says. “Will healthcare systems reimburse adequately so future development is not hampered?”

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The team members have learned from each other—strengthening their skills and expanding the available resources. Having a program with dedicated staff for amputation rehabilitation is quite unusual in the current healthcare environment. Having this team at MossRehab achieve CARF accreditation for inpatient and outpatient programs, as well as achieve the status of leaders in the field for clinical care and education, translates to a level of excellence that serves our patients and healthcare partners.

I hope you enjoy reading through this issue, learning more about the achievements of our amputation program, the path to research and clinical applications we are developing and our collaboration with top scientists in industry. I’m sure you’ll especially enjoy reading about one of our patients, Daniela Garcia Palomer, MD, who is now identified as the only physiatrist with quadruple amputation in the world. MossRehab had a particular influence in her choosing to become a physiatrist as she completed medical school and helped her fulfill her dream to work as a doctor. Daniela is a wonderful individual and a fantastic parent and wife, but I am pleased to say that she is a terrific physiatrist as well.

As always, I am available to answer any questions or discuss any ideas that you may have in regards to the activities at MossRehab. Enjoy.



Team Approach Promotes Holistic Healing

When a patient undergoes amputation of one or more limbs, recovery and rehabilitation take many forms. That patient faces new challenges in performing even the most mundane daily tasks, and an integrated approach to healing is essential.

“We work with patients following amputation, and after they receive their prostheses, so they can return home safely, participate fully in the community and reach their goals,” says MossRehab physical therapist Eilise Blessington, DPT. “All patient care is very individualized based on the person’s goals for rehabilitation considering their level of amputation, stage within the rehabilitation process, co-morbidities, social roles and participation, and prior level of function.”

Blessington says MossRehab’s comprehensive, team approach is so effective because each clinician realizes the importance of all disciplines being involved in patient care.

Doctors address important issues like wound care, skin irritation and pain management. Recreational therapists take patients on community outings to make sure they’re comfortable and confident in rejoining their normal activities. Physical therapists work with patients to build strength, range of motion and mobility with a new prosthetic device. And occupational therapists focus on issues like residual limb care, prosthetic management and balance needed for daily activities. Psychologists and nurses help educate and enhance self-esteem while the prosthetist addresses the prosthetic needs.

“The concept of a team approach is that each of us brings our expertise to the table to treat the whole person,” says MossRehab physiatrist Edward Wikoff, MD. “Through this, the patient gains the ability to do a whole array of things independently and to their satisfaction.”

Patients and Physiatrists: A Lifelong Relationship

“In our roles, we look at the long view,” says Dr. Wikoff. “Once we meet with patients after amputation, they’re pretty much linked with us forever. Patients should be

connected with physiatrists for life because—as the years go by and they gain and lose weight, deal with other medical problems or even just feel the effects of aging—they may develop arthritis or need joint replacements, which are pretty common in the general population. But these patients are unique because of the amputation. It’s another detour in a person’s life, and we can provide that holistic approach—with therapists as well as prosthetists and surgeons—to healing.”

As a physiatrist, Dr. Wikoff must understand each patient, his or her goals and what elements could impede his or her progress. He regularly helps patients with pain management, wound and residual limb care, and education about management of related medical issues.

“One of our goals is to protect the other limbs and prevent future amputations,” says Dr. Wikoff. “Many patients

undergo amputation because of diabetes or poor circulation, so we want to educate them about how to best stay healthy. When we first meet patients, they’re overwhelmed as they have just undergone a life-changing event. We need to ground them as to where they are now and create a realistic view for the future.”

Dr. Wikoff says he frequently collaborates with physical, occupational and recreational therapists to return a patient to the home, family, employment and recreational roles he or she is seeking to resume.

“I can help guide the team when it comes to addressing pain, muscle weakness, hypertension—medical issues that impede progress,” says Dr. Wikoff. “And they can apply their expertise in developing the right rehabilitation process, introducing relaxation techniques for example, and offering ideas that I might never have thought about.”

Occupational, Physical and Recreational Rehabilitation

Dr. Wikoff and his physiatrist colleagues work with patients during their entire rehabilitation process, from surgery through functional return to the community with a prostheses. And occupational therapy begins early in that process—usually at the wheelchair level.

“**The concept of a team approach is that each of us brings our expertise to the table to treat the whole person. Through this, the patient gains the ability to do a whole array of things independently and to their satisfaction.**”
Edward Wikoff, MD



A patient at MossRehab learning to ride her bicycle again as part of her rehabilitation program after sustaining four limb amputation.

“I provide pre-prosthetic education and training for residual limb care and adjustment to household mobility and activities of daily living,” says Drew Lerman, OT. “The patient is then discharged home while his or her limb heals. A few months later, when the patient is ready for prosthesis fitting, I teach him or her how to use and care for the prosthesis, how to put it on, manage the components and integrate it into everyday tasks including dressing, grooming and household mobility.”

After a patient’s discharge, the team follows up with outpatient therapy to encourage his or her independence in higher-level activities such as cooking, household management, community mobility and continued prosthesis tolerance.

The physical therapist also plays a role in pre- and post-prosthetic training and rehabilitation by developing exercise programs and educating patients about residual limb care, functional mobility and prosthetic management to enhance participation in their roles at home and in the community.

“Helping my patients progress toward and achieve their goals is very rewarding,” says physical therapist Blessington. “In inpatient rehabilitation, I will see a patient following his or her amputation. Then, when that patient returns for prosthetic training months later, and is able to walk out the door with his or her prosthesis and return home, it is a great experience. Many patients say it’s really hard to process at first that once they’re healed and fitted with their prostheses, they’ll be able to partake in the activities they love. Patients are really

receptive to the team approach because everyone’s on the same page with the same patient goals in mind.”

Being physically active helps improve all aspects of a patient’s recovery, and the role of the recreation therapist on the amputation/prosthetic team is to improve or maintain physical, cognitive, social emotional, and spiritual functioning to facilitate a patient’s full participation in life.

“Specifically, I help patients by using recreation and other activity-based interventions that are specific to their unique needs,” says MossRehab recreational therapist Anne Wieland, CTRS, MHA. “Individuals who have had an amputation are required to attend an education session daily on the unit.”

Wieland’s long- and short-term work with patients includes activities for pain management, community resource education and skill development, family training and instructions, home leisure activity program development, long-term walking program education, community integration skills at the ambulatory or wheelchair level, and much more.

“**Patients are really receptive to the team approach because everyone’s on the same page with the same patient goals in mind.**”
Eilise Blessington, DPT

“The goals of outings vary from patient to patient but, primarily, they provide the patient the opportunity to experience issues related to independent function,” says Wieland. “We seek to improve the patient’s ability to participate in community activities; increase problem-solving skills related to architectural, attitudinal or communication barriers encountered within community settings; and improve the patient’s awareness of safety and community resources that are available.”

The team approach to amputation rehabilitation is a more efficient and effective intervention to address the needs of people with limb amputation. MossRehab has proudly used this approach based on long-term experience that has served thousands of patients over the years and has helped to establish the requirements for Commission on Accreditation for Rehabilitation Facilities (CARF) certification.

Prosthetic Potential: Using Technology to Fine-Tune Functionality

Underpinning the best amputation care and prosthetic management for patients is continuous research to improve prosthetic functionality and being able to better predict patient response to specific interventions.

Mukul Talaty, PhD, a biomechanist at MossRehab, is working on two research projects that are making significant headway toward these ever-evolving goals.

Project 1: Force-line Visualization Technology to Enhance Prosthetic Alignment

“Force-line visualization is a technique that was developed here at MossRehab back in the 1970s and 80s when it was a federally funded Rehabilitation Engineering Center,” says Dr. Talaty. “It allows us to literally see the forces acting under the foot as someone walks.”

“It has been a long-term goal of ours to infuse objectivity into prosthetics education and clinical processes.”
Mukul Talaty, PhD

By using force-line visualization, a clinician can easily spot gait abnormalities and quickly make adjustments to prostheses.

The original version of this technology, and the version currently used in the lab, is analog. A few years ago, MossRehab researchers worked with an industry partner to develop a digital version.

“Together with Bertec Corp., we obtained a National Institutes of Health grant to study how this could be used to train novice clinicians,” says Dr. Talaty. “We demonstrated that using this technology, along with some simple verbal and hands-on demonstrations, allows novice clinicians to achieve alignment outcomes similar to that of highly experienced clinicians.”

This research is important because variability of functional walking outcomes in prosthetics due to alignment is one of the major areas that lacks proper scientific investigation and evidence-based rules.

“It has been a long-term goal of ours to infuse objectivity into prosthetics education and clinical processes,” says Dr. Talaty. “To that end, Dr. Esquenazi and I presented two workshops at this year’s American Academy of Physical Medicine and Rehabilitation Annual Meeting in San Diego, where we demonstrated the use of the force-line to understand and improve prosthetic alignment.”

MossRehab researchers continue to work with industry partners to determine how to further develop this technology—making it more accurate, portable, affordable and accessible to facilities that provide prosthetic services—and how to teach clinicians to properly use it.

“A major obstacle is acquiring sufficient funding to continue to move this research forward quickly and with maximal impact,” Dr. Talaty says.

Project 2: Computer Simulation to Explore Prosthetic Function and Outcomes

A relatively newer project that branches from Dr. Talaty’s ongoing work in computer simulation uses physics-based models to synthesize human walking in a new way.

“We can use computer models as a platform to understand how people walk and how interventions may affect walking performance,” says Dr. Talaty. “Our model is a neuromusculoskeletal model, with elements of neural control: neural control loops, feed-forward and feedback elements, mathematical equations to codify basic neural principles such as reflexes and reciprocal inhibition. It also includes elements of muscle control: how they contract when neurally excited, how much force they produce, how bones are connected and more. This is combined with pure physics equations that govern how bodies move.”

Dr. Talaty has developed this computer model with the help of other scientists and several graduate students, and it’s now able to simulate normal and pathological walking in a manner very similar to that of real people.

“It captures many of the salient kinematic and kinetic features of walking,” says Dr. Talaty. “We have begun to explore how it can teach us how walking is influenced by interventions. Ultimately, it may be able to be configured to model individual patients and their gait problems and then used to predict how each specific patient would respond to specific interventions. In the meantime, there is much we can do with such a powerful platform.”



A person with left transfemoral amputation using the resources of the Gait and Motion Analysis Laboratory to optimize dynamic prosthetic alignment.

Last summer, Dr. Talaty worked with an undergraduate engineering intern who had an interest in prosthetics. Together, they “amputated” the foot and lower leg of the computer model and gave it a prosthesis that represented a currently used prosthetic device.

“That the model was even able to walk after this was no small feat and speaks to the robustness of the neural control scheme we have embedded,” says Dr. Talaty. “We then altered the alignment of that prosthesis and measured how the walking performance of the model changed. We are in the process of comparing that response to the response of people with amputation.”

The key is determining if the model responds in a similar enough manner to the actual system it is designed to mimic, he says.

“Validation would obviously be a pre-cursor to meeting patient-specific needs.”

“We can use computer models as a platform to understand how people walk and how interventions may affect walking performance.”
Mukul Talaty, PhD

Daniela Garcia Palomer, MD:

How Personal Experience with Amputation Shaped Her Medical Practice



Daniela Garcia Palomer, MD, was in her fourth year of medical school when she embarked on a train trip to the Inter-Medical School Games, an annual tradition of athletic competition among Chilean medical students. As she

walked between train cars with friends, she fell through a gap onto the tracks. Miraculously, she survived the ordeal, but the impact of the fall and the train passing over her amputated her left leg above the knee, severed both forearms and hands, and amputated her right leg below the knee.

Despite these unimaginable injuries – and the long months of rehabilitation that followed, including three treatments (six weeks, eight weeks and four weeks) at MossRehab – Dr. Garcia Palomer recovered, completed medical school, and became the first physician with quadrilateral amputation. Now a physiatrist working in the Gait Laboratory at the Teleton Rehabilitation Institute in Chile, Dr. Garcia Palomer has a special bond with patients recovering from amputations.

Dr. Garcia Palomer, who was a keynote speaker at the two-day MossRehab Rehabilitation of Persons with Amputation conference in October, took time out to answer our questions.

How did your personal experience influence the way you treat your patients and the way you explain their recovery and adjustment process?

Being in the role of a patient gave me an inside look at what my patients go through in their daily lives. Now I not only understand—from a medical perspective—what they are going through, I know what it's like.

How did your own experience with rehabilitation, adapting to prosthetics and adjusting the way you performed daily activities influence your choice to become a physiatrist?

I've always loved to work with children so, before the accident, I wanted to be a pediatrician. I really didn't know anything about rehabilitation or physiatry. After the accident, I learned and experienced what rehabilitation could do for someone, and I fell in love with it. Also, meeting an extraordinary physiatrist like Dr. Alberto Esquenazi, gave me a role model to follow. Now I work in rehabilitating children and young adults.

When you live through a life-changing situation, your perspective changes, and you learn to appreciate what really makes you happy. I realized that, for me, being a doctor was one of those things.

What are some of the biggest professional challenges you've encountered? Are these similar to some of the difficulties your patients face?

Going through the internship was quite challenging. Running all day in the hospital and having long work days were physically very difficult. And I didn't want anybody to think I couldn't do it, so I had to really give a huge effort. I've also seen my patients struggle with educational or work-related problems, so I try to support them in any way I can.

What have been your most memorable and rewarding career moments so far?

Every time patients or their family members tell me they are grateful for something I've done, it lights up my day and makes me want to continue giving them the best I have every day.

Do you think patients are able to relate to you and trust you more because you've shared in their experiences? Do you think that's made you a better practitioner?

Of course! They know that when I tell them something, it's not just to make them feel better or because that's what I've been taught to say, but because I've been where they've been, and I understand what they are going through. I think that being able to do this is one of the best tools I have as a physician.

What elements of your personal experience do you share with patients to inspire them in their recovery?

I try to always focus on the patients' experience and what they have to say. I make a great effort to listen and to give them advice based on their unique situations. But if I think that something from my personal experience could help them understand better what they are going through, or if it will help them overcome a problem, I'll share it with them.

What do you feel is the most important element in rehabilitation for your patients? Are the physical challenges most difficult to overcome or the emotional and psychological elements?

They should never stop believing in themselves and should have people around that care and also believe in them. I think the emotional and mental elements are always harder to overcome because you feel more limited than you actually are. If you don't even try, how can you know how far you can go?

Conference Addresses Critical Interventions After Amputation

Rehabilitation physicians, physical therapists and prosthetists gathered for a two-day MossRehab Rehabilitation of Persons with Amputation conference in October 2014, where they learned about the importance of physical therapy in the rehabilitation of patients with amputations and critical interventions for higher-level functioning young people with amputations and those with dysvascular amputation.

The conference included a clinical education portion, a lecture and recreation clinics for patients and former patients focused on staying active after amputation. Participants learned how to identify pre-prosthetic interventions that could promote excellent rehabilitation outcomes; describe gait training interventions for functional mobility; and explain the effects of prosthetic alignment and componentry on patients' gait and functional outcomes. Interventions for pain were also addressed.

Two keynote speakers were featured: Daniela Garcia Palomer, MD—a physiatrist from the Gait Laboratory at the Teleton Rehabilitation Institute in Chile—whose bestselling book *Eligi Vivir (I Choose to Live)* is an autobiographical account of losing her limbs in a train accident and the rehabilitation process that led to her completion of medical school; and Andreas Kannenberg, PhD, the executive medical director of Ottobock North America and 2010 recipient of the Thranhardt Award presented by the American Orthotic and Prosthetic Association for his contribution to education and research in the field of orthotics and prosthetics.



Current and former patients and their families listening to a presentation by Daniela Garcia Palomer, MD.



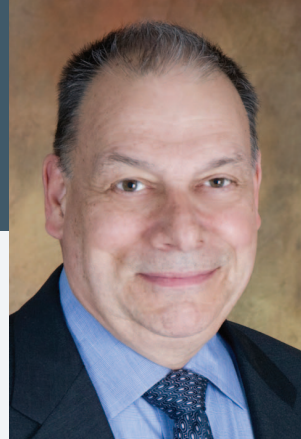
Dr. Garcia Palomer addresses the audience during the conference.



Dr. Garcia Palomer receives the MossRehab Empowerment Award from Alberto Esquenazi, MD, chief medical officer of MossRehab.



Dr. Garcia Palomer and family during the conference.



Temple/MossRehab Residency Alumni Robert "Skip" Meier, MD

Then: Temple/MossRehab resident from 1970 until 1973
Now: Founder and Director of Amputee Services of America

Robert "Skip" Meier, MD, fell into medicolegal work in the 1970s when he took on some complex amputation rehabilitation cases and faced a number of questions regarding long-term medical services, prosthetic replacement frequency, life expectancy and home care services that would be necessary throughout the life of a person with an amputation.

"This has since become an area of rehabilitation planning that has formal coursework and certification," says Dr. Meier, who founded Amputee Services of America (ASA) to provide comprehensive outpatient services for people with amputations. "This education and designation allows a life care planner to take a particular disability and prognosticate life-long rehabilitation needs and costs with the goal of achieving the best possible functional and emotional outcomes."

Dr. Meier says he was fortunate as a Temple/MossRehab resident to be exposed to outstanding faculty, residents and administrators who practiced exemplary rehabilitation in an innovative and patient-friendly manner. From there, his professional career took him to The Institute for Rehabilitation and Research (TIRR) and Baylor College of Medicine and then to the University of Colorado Health Sciences Center, where he served as chairman of the Department of Rehabilitation Medicine until 1996. In 1996, he entered private practice and launched ASA.

"We have a unique patient population compared to other amputee centers," says Dr. Meier. "Our mean age is 47 years. Forty percent of our patients have sustained upper extremity loss and 35 percent have double-, triple- or quadruple-limb loss. Our population also has a different causation mix than most centers—50 percent have sustained trauma leading to amputations, 30 percent are secondary to vascular issues, 15 percent are related to cancer and five percent are from other causes."

"I've realized the emotional adaptation to being a person with an amputation is key to a patient's wellness and quality of life."
Robert Meier, MD

Meier says ASA is designed to promote patient empowerment, going well beyond just the return of relevant function. Patient education is a priority, so persons with amputation can make their own informed decisions concerning future healthcare.

Now located at Presbyterian/St. Luke's Medical Center in Denver, ASA provides

inpatient surgery, acute rehabilitation and sub-acute rehabilitation; outpatient rehabilitation therapy services; and prosthetic and orthotic services on site. Each patient undergoes evaluation with Dr. Meier and various therapists, psychologists and prosthetists. This team then sets patient goals—a list of expected functional outcomes and timelines for objectives.

"Probably the most important lesson I learned from my training at MossRehab was that amputation rehabilitation is so much more than an excellent amputation and a well-made prosthesis," he says. "Over my 45 years of rehabilitation exposure, I've realized the emotional adaptation to being a person with an amputation is key to a patient's wellness and quality of life."

SCHOLARLY UPDATE

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We're proud to announce that the 2015 All About Art honoree will be Nathaniel Mayer, MD.

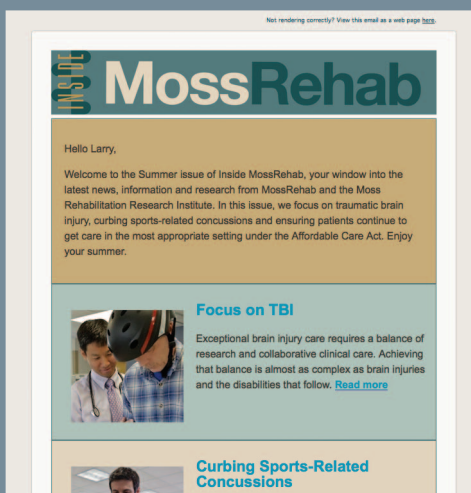
Dr. Mayer has been a strong supporter and patron of All About Art, an international juried exhibition by professional artists with physical disabilities, since its inception at MossRehab in 1979. We are inspired daily by his dedication to his profession, teaching and to his patients at MossRehab. We are thrilled to honor such a wonderful person and colleague.

Please join us in congratulating Dr. Mayer on this recognition by making a contribution in his honor at mossrehab.com/allaboutart.



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