



Clinical Narrative
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My name is Suzanne Curley and I am a senior occupational therapist in the Upper Extremity/Hand Therapy outpatient department. I came to MGH over five years ago as a staff therapist and, while I've been an OT for over nine years, regard my years here as the most challenging yet satisfying years of my career. I hope the following patient narrative will show you one of the reasons why I think this is so.

My experience treating Sean highlights the holistic approach occupational therapists take with our patients and illustrates many of the reasons I feel privileged to specialize in the field of hand therapy. Sean's evaluation and treatment required specific knowledge of hand anatomy, tissue healing, wound care, biomechanics, and sensorimotor function, but also required creative, client-specific solutions to assist him return to the person he was prior to his unfortunate injury.

When Sean walked in the door of our clinic for his initial evaluation I saw a large, white, bulky dressing on his left hand and surmised from this that he was a burn patient. I immediately began thinking of the various treatment modalities he might need given my knowledge of burn patients. Then he turned around and I saw the same dressing on his right hand. "Uh oh", I thought, "how is this man able to do anything for himself?" and my thoughts immediately turned from treatment modalities to ways to help this man just get through his day.

It turned out, I was also wrong about his burn injury. This patient had sustained bilateral frostbite injuries one week prior to the day I met him. He was riding his bike to work in 2-degree weather without gloves. When he realized he couldn't feel his hands he went to MGH where he had swollen, erythematous hands with significant blisters throughout and cyanosis at his distal tips. He was hospitalized on the burn unit for two days where he had Silvadene dressings changed twice daily and significant debridement of his wounds once his blisters broke. When he was discharged home, he was set up with an appointment in the outpatient occupational therapy clinic for one week after his initial injury. This is where I met Sean.

I had not seen many frostbite patients in my experience and certainly none of his significance. However, my role in treating him was clear as it is for all our patients: maximize functional recovery of the affected tissues as well as assist him with as early and safe return back to as normal, independent lifestyle as possible. In essence, help him return to the person he was prior to his injury.

As I assisted Sean with the very basic tasks of removing his coat and taking off his backpack, I immediately began to learn what an accomplished and active person he had been prior to this injury. As he revealed his typical day and week, I realized all the roles and responsibilities he was missing out on since the injury. Sean is a professor of Microbiology at a local medical school and runs a lab doing research of viral materials. In his job, he needs to type long reports as well as perform delicate pipetting to analyze and mix dangerous viral materials. He does all the training for the lab assistants including showing them the precise way to perform the substance analysis. Sean lives with a significant other who has been assisting him with all self-care tasks. He noted that his partner had to return to work so Sean would be alone at home most of the day. In his free time, Sean enjoys cooking, gardening, biking, and other outdoor activities. While Sean

was pleasant during this initial assessment, his frustrations and embarrassment over his injury, and his role in causing it, were evident. This was a person who enjoyed much control over his life and work and his new “helplessness” as he called it was affecting every aspect of his life. I hoped I could help him regain some control and bring enjoyment back into his life.

I realized we had much to do during this initial evaluation and I had to prioritize our activities. As I gently removed one of his bulky gauze dressings I noticed his reluctance to look at his hand. I prepared him for what it would likely look like and began explaining how tissues heal so he might have some timeline to consider. Being a planner and a scientist, this interested and distracted him. Underneath this dressing his digits had dusky tips with light bloody exudates along the sides down to the web spaces. His other hand looked similar. In addition, he had significantly increased edema in all eight digits and both thumbs. Further evaluation revealed significantly decreased active and passive ROM and grip/pinch strength as well as impaired sensation and moderate to severe pain while on pain medication. While I documented these impaired client factors and began treatment planning in my mind I was also aware that my primary focus that day for him was to improve his ability to take basic care of himself. I felt we needed to address basic issues such as going to the bathroom, getting a simple bite to eat, turning the key and door handle to get into his home, and doing light hygiene.

I was concerned Sean’s frustration with himself and feelings of self-blame would affect his rehabilitation so I decided to put control over his rehab back into his own hands. I asked him about his most important goals. They were consistent with mine but he added doing some light typing in order to be able to take on some work tasks at home and help his colleagues. When he joked that he also thought being able to open a wine bottle was a good goal, I saw that his good humor had returned and felt we’d be able to move forward as a team. I told him I felt all these goals (except the wine opening!) were attainable for him today or in the near future and suggested we begin work on them immediately.

First, I dressed his wounds using xeroform and thin finger stockinette rather than bulky gauze dressings. This immediately allowed him more mobility and revealed that he had some pressure sense on the pads of his digits. When he noted how much better his fingers felt in these dressings, I suggested that his significant other come to his next appointment so I could show him how to do Sean’s dressings at home. Next, I initiated edema management techniques including elevation, use of a compression garment, and active pumping of his digits. Edema limits range of motion and can scar down tendons so I was anxious to manage it quickly. I also instructed him in active range of motion exercises for his digits. I gave him a variety of exercises that encouraged function of the different structures in the hand including the flexor tendons, extensor mechanism, intrinsic muscles, venous/lymphatic system and web spaces. I avoided any passive motion for two reasons. Given his significant amount of edema, I was concerned that aggressive stretches would stretch his collateral ligaments and compress his digital nerves causing further altered sensation. I also wasn’t sure how deep or how significant the tissue injury in his digits was and I didn’t want to damage any structures. I educated him to watch carefully for signs of blanching or excessive stretching of the dorsal skin. Given his impaired sensation, he might not feel pain or stretching to know if he was overdoing the exercises and causing harm. I also gave him blocking exercises to further increase motion of his interphalangeal (IP) joints by encouraging some pull of his flexor tendons. These exercises improved his motion while preventing the tendons from adhering to other tissues. The resting splints from his inpatient stay in the hospital still fit so I told him to continue wearing these at night. These splints put his hands in a good resting position to prevent shortening of the soft tissues.

One of my biggest concerns was the darkened tips of his digits as well as the significantly decreased sensation in his tips. I immediately instructed Sean about skin protection to ensure he avoided further injury to his digits. Formal evaluation later that week using the Semmes-Weinstein monofilament test revealed loss of protective sensation on most of his tips. I knew this would make basic self-care such as fasteners difficult to perform let alone trying to perform his delicate work tasks. We would have to take one challenge at a time. I was hopeful the dusky tips were congested blood and not necrotic tissue. In the clinic setting, there was no way to tell. I knew this was of great concern to Sean so I called his surgeon to get his opinion and see if he had noticed any bleeding in the tips when he had done his debridements. His surgeon noted that he had not seen any bleeding and that it was too soon to know if the tissues would survive. He agreed that there was no immediate treatment until the tissue “declared” itself by healing or dying. We decided that we would continue with our plan of care and hoped he wouldn’t lose any tissue in his tips. When Sean asked about this potential, I answered his questions honestly given what I knew at the time. He seemed to appreciate my honest answer and this formed the basis for our future relationship.

Next I had Sean attempt several basic self-care tasks. He was unable to hold a utensil in his hand so I put various widths of cylindrical foam on utensils and had him try picking up food from a plate. He required the widest foam but was able to get food into his mouth with this adaptation so this was a big accomplishment. Even with the smaller dressings he lacked the dexterity to do fasteners, particularly his zipper on his pants. He had actually already modified this by adding the twist tie from a loaf of bread to the zipper for him to grasp. This was working fairly well but was still difficult to grip and, as Sean joked, when you’re in a hurry, this can be problematic! I suggested he put a silver ring on the zippers of his pants so he just had to hook his finger onto it. This worked quite well. While it could have been awkward discussing delicate hygiene issues so new in our relationship, we found we shared a similar sense of humor that allowed us to be open and frank about issues and brought some fun into a difficult time. Other adaptations included a key turner that allowed him to use a gross grip to turn the key until his fingers were stronger and his tips less sensitive to turn a regular key. He was still significantly limited, and frustrated with his injury, but the ability to do these few basic tasks made him feel a little bit like his old self again.

These were some of the modifications we made during our first session to allow Sean some independence at home and at work. Initially, we compensated for his impairments using adaptive equipment, like the cylindrical foam, to help him resume meaningful activities in his life. Not only does this help him on a practical basis, it improved his self-esteem and encouraged him onward. The self-care activities Sean began to do on the first day also supplemented the range of motion exercises he was given as they themselves are important forms of exercise. Studies show that purposeful activities, such as grasping utensils or typing on a keyboard, motivate patients to perform continued repetitions of motion and reduces their tendency to anticipate pain more than rote exercises or non-purposeful activity. Sean used increasingly smaller grips on his utensils until five weeks later he was able to use a regular utensil. This knowledge was much more satisfying to him than my report to him that his total active motion had improved by 12% on the left and 13% on the right.

There were roadblocks ahead for Sean. Swelling was a significant problem both limiting digit ROM and giving pain to the IP joints of his digits. His tissues were extremely reactive with even small amounts of activity. The third week after his injury Sean had a significant decline in his status when his swelling, pain, and redness increased, ROM decreased, and some functional gains were lost. Initially this was alarming and disheartening for both of us. The swelling looked and felt different from a typical trauma patient. The edema was more diffuse throughout his digits, the color looked sunburned and again was more consistent in color, and it felt softer than usual skin on the outside and almost crunchy to touch deeper down when I did retrograde massage. I

wasn't sure if this change in status was due to overexertion despite our judicious level of exercise and activity. I found the changes greater than I had usually seen with injured tissues so I researched and read some articles on frostbite. I read that this hypersensitivity of the injured tissues was common following frostbite due to injury to the skin cells. We modified his home program and were more vigilant about activity levels and soon the tissues calmed down and he made gains again. Eventually, Sean made such improvements in ROM, strength and sensation, and decreases in pain and edema that he was able to hold a regular utensil, grip his bike handlebars, and pipette small test tubes of viral materials.

This last activity was one which we spent weeks working on before he could do on his own. Once his Semmes-Weinstein test had improved to where had had only minimally diminished light touch sensation and he had adequate ROM and pinch strength, we were ready to focus on this work task. Initially I had Sean practice using large test tubes and water using progressively smaller test tubes and finally the real substances. About 11 weeks after his initial injury he was able to complete a complex test using the smallest test tubes and radioactive materials. He had completed the entire test first using water so he was confident in his abilities. This boosted his confidence and self-esteem enormously. As he returned to these important life roles, I was appreciative that my skills as a hand therapist and creativity as an occupational therapist had combined to find the right solutions for this patient...and I looked forward to the challenge of the next one.