

## Dr. Moise's Medical Update

### Medicinal Cannabis with Spinal Cord Injury



The amount of people in the United States dying of prescription opioid pain medications has steadily increased in the past 10 years, with no signs of slowing down. As spinal cord injury commonly causes pain that may lead to the use of prescription pain medications, people with spinal cord injury are at risk of becoming part of this growing "opioid crisis" which puts people at risk of dying due to these medications. A research article published in 2017 in the journal titled Archives of Physical Medicine and Rehabilitation addressed the risks of prescription pain medications in over 2000 people with spinal cord injury that were followed over a 10 year period. They found that use of opioid prescription pain medication directly increased the risk of dying during that 10-year time frame. So there is great interest in finding non-opioid medications for pain related to spinal cord injury.

Just as the human body has opioid receptors to which opioid (narcotic) medications attach to enact their effects of lessening pain, and to cause various possible side effects including sedation and respiratory suppression, the human body also has cannabinoid receptors to which the cannabinoid molecules from the marijuana plant attach, to enact their effects. The brain, spinal cord and peripheral nerves have many cannabinoid receptors, and well-done research studies have shown improvement in nerve pain associated with multiple sclerosis and peripheral neuropathy. There are also many cannabinoid receptors in the muscles, so it is not surprising that many people who have tried cannabis state that it helps their muscle spasms. On the other hand, human lungs have very few cannabinoid receptors, so in contrast to opioid medications, the risk of overdose death from respiratory failure in adults using cannabis (marijuana) is essentially zero. With the increasing number of states that have made medicinal cannabis legal, this has become a new non-opioid treatment option to consider for those with pain and muscle spasm due to spinal cord injury.

In November of 2017 in The Journal of Spinal Cord Medicine, an article was published that discussed the increasing use of cannabis in Canada for the treatment of neuropathic pain and spasticity in people with spinal cord injury, including the leaf and oil forms that can be obtained from marijuana dispensaries, as well as prescription forms of cannabis available in Canada, namely Nabiximol, an oral spray containing the cannabinoids THC and CBD that is approved for spasticity and neurogenic pain due to multiple sclerosis, and Nabilone, a synthetic cannabinoid which is also available in the United States where it is approved for nausea and vomiting symptoms, but which costs about \$2500 for a one month supply and is a schedule 2 medication with the same rules as opioid meds like Oxycodone and

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## Medicinal Cannabis with Spinal Cord Injury cont.

Hydrocodone. The article concluded by stating that cannabinoids can be useful in the management of neurogenic pain and spasticity in SCI.

Possible negative effects of cannabis include depression, hallucinations, drowsiness, euphoria (high), dry mouth, and drop in blood pressure. There is also a high abuse potential in that many people use cannabis for its intoxication effects. To minimize the chance of these negative side effects in the treatment of spasticity and/or nerve pain, cannabis varieties that are high in CBD and low in THC content are recommended. Despite the possible negative side effects, opioid meds have similar possible side effects, and cannabis does not have the respiratory suppression and risk of death associated with opioids.

### **DONATED (FREE) COMPUTERS**

We have recently had a community fundraiser to help people in the Inland Northwest with spinal cord injuries. Since research has shown that computer internet access is important in maintaining health and quality of life for those with SCI, we are going to use some of the proceeds from that fundraiser to provide free IPAD tablet computers to 5 to 10 individuals with SCI. If YOU have a spinal cord injury, do not already have a computer, or have a computer you cannot use due to weak hands that cannot operate a standard keyboard, and if you have difficulty financially affording to purchase an ipad yourself, then please respond by email, including your name and phone # (and state you want an ipad) to: [whannel@st-lukes.org](mailto:whannel@st-lukes.org)

### **2018 - SAVE THE DATE**

June 9	Outdoor Rec Experience @ Bear Lake
June 30-July 1	Hoop Fest
July 14-15	Ski Fest
September 10	T-up for Team St Luke's Golf Tournament
October 13-14	Spokane Showdown Wheelchair Basketball Tournament

## **Stem Cell Therapy after SCI, Where We Are and Where We Are Going**

By Alicia F Hegie, Psy.D.

In the past 10 years, there has been a great deal of talk about stem cell therapy, and the implications for treatment of central nervous system injuries including spinal cord injury (SCI). This excitement is increased by the media, including TED talks with titles such as "The paralyzed rat that walked." Excitement and hope that are tempered by the attendant risks of stem cell therapy, including tumor formation or abnormal circuit formation leading to additional dysfunction (1). So let's talk about where stem cell therapy is, and where it is poised to go!

First and foremost, we need to understand what spinal cord injury is. When the spinal cord is injured, several kinds of tissue damage can result: bruising or bleeding in the spinal cord (blood is toxic to nerves, and can trigger additional cell deaths), secondary injury (including damaged nerve cells which die over the first 24-48 hours, as well as additional damage resulting from swelling), and demyelination or loss of the insulation around the nerve that protects it and allow it to fire. After a spinal cord injury, the nerves try to heal, but there are challenges, including: slow rate of growth, difficulty re-connecting nerves in the exact correct way (particularly if there is a hole in the tissue), and scars in the spinal tissue which protect tissue from further damage but also limit recovery (by creating a mechanical barrier to nerve growth). In order to 'cure' a spinal cord injury, we would need to replace damaged nerve cells, reverse blocks that prevent nerve healing, fill any tissue holes with tissue that nerves can grow through, and re-line nerve cells to protect them and allow them to fire.

One meta-analysis of the efficacy of NSPC's in animals found that NSPC's can significantly improve motor function, bladder function, and pain in studied animals with SCI (2), however not all studies showed significant results. It was noted that results were affected by type of injury (for example, compression injury or bruise versus a cut), when in the recovery process stem cells were used, and if immunosuppressive drugs were used. Analysis showed that embryonically derived stem cells were considerably more effective in prompting motor recovery compared to cells taken from adults, and in some cases adult cells were not as safe (more likely to form a tumor). Timing of intervention was also found to be significant, with earlier treatment (during the acute phase) resulting in better motor function recovery. The type of injury also affected outcomes: in this analysis, injuries that were transection (a complete tear) or contusion injuries resulted in more effective response to treatment (versus compression injuries), which is thought to be related to inflammation response. Finally, use of immunosuppressants decreased the efficacy of transplanted NSPC's on functional recovery. Interestingly, use of specialized stem cells designed to treat pain were shown to attenuate neuropathic pain, while general neural stem cells did not have this effect. So, when it comes to neural stem/progenitor cells, there is reason to be cautiously optimistic about motor recovery after SCI, however results vary based on type of injury, time since injury, type of cells used, and procedure details. This science is still very young, and exclusively in animal trials.

Now let's talk about the second and most widely studied stem cell type, bone marrow-derived cells (BMDC), and their efficacy and safety for transplantation in individuals with SCI. Excitingly, these studies have been started in humans, after safe and effective trials were demonstrated in animals. Multiple meta-analyses have been run on studies of BMDC stem cells in humans, and generally support their efficacy in improving functioning (3, 4). In human studies, BMDC transplantation was found to be "extremely safe," with no significant side-effects reported at least six years after treatment (3). While some overall improvements on the American Spinal Injury Association Impairment Scale (known as the

## Stem Cell Therapy after SCI,

### Where We Are and Where We Are Going CONTINUED

AIS or AISA) were noted, no significant difference in motor, pinprick or light touch sensation, or residual urine volume was found (3). In BMDC transplantation (and in contrast with NSPC transplantation), results were better for chronic or long-duration injuries (no longer in the acute injury phase), which is suspected to be related to inflammation in the acute phase. While cell transplantation numbers were shown to impact the efficacy of the procedure, initial ASIA grade did not show a statistically significant difference in long-term results (while individuals with an ASIA A injury improved more than individuals with an ASIA B or C injury, the difference was not significant). Type of injury was not addressed in these studies. In reviewing the research, some individual studies have found that stem cell transplantation significantly improved AISA grade, sensation, and bladder function, so why the inconsistency? Because even though we have moved to human trials and even though a lot of people are asking these research questions, the number of participants is still pretty low. That increases the risk of coming to a conclusion that is inaccurate because of a few unusual results. Moreover, as of right now there is no 'best practice' in terms of how many cells to use and/or when to perform the transplantation, because we just don't have enough information. Bottom line for BMDC stem cell transplantation is this: there is no evidence of adverse side effects from transplantation, and some functional improvements have been demonstrated, however reliable information about what aspects of functioning improves and how much is still not clear, and at this time the most recent meta-analyses have not shown reliable motor improvements.

So there we have it. Stem cell transplantation for individuals with spinal cord injury remains a promising but imperfect treatment option. There are numerous ongoing studies to examine the benefits and long-term functional changes associated with this treatment, and we will all watch with time as best practices and results develop. For now, while stem cell transplantation is becoming a more readily available treatment option, I would encourage patients to be discerning when gathering information. Consider where the information is coming from, and when in doubt ask questions! Lastly, one of the greatest struggles in life is to balance being in and accepting the present moment while hoping and striving for future change. So here's to making the most of every day, in addition to scouring the latest medical journals for hope for tomorrow.

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2. Youseffard, M., Rahimi-Movaghar, V., Nasirinezhad, F., Baikpour, M., Safari, S., Saadat, S., . . . Hosseini, M. (2016). Neural stem/progenitor cell transplantation for spinal cord injury treatment; A systematic review and meta-analysis. *Neuroscience*, 322, 377-397. doi:10.1016/j.neuroscience.2016.02.034
3. Li, X. C., Zhong, C. F., Deng, G. B., Liang, R. W., & Huang, C. M. (2015). Efficacy and safety of bone marrow-derived cell transplantation for spinal cord injury: a systematic review and meta-analysis of clinical trials. *Clinical Transplantation*, 29(9), 786-795. doi:10.1111/ctr.12580
4. Zhang, L., Fan, X., Wang, J., & Lin, X. (2017). Stem cell transplantation for spinal cord injury: a meta-analysis of treatment effectiveness and safety. *Neural Regeneration Research*, 12(5), 815. doi:10.4103/1673-5374.206653

## **The Quick and Dirty About Keeping It Clean: Clean Technique for Self-Catheterization**

*by Emily Lunden, OTR/L*

After a spinal cord injury, the bladder may be affected and is no longer able to empty urine as it did prior to injury. As a result, a catheter may be needed to empty the bladder on a regular basis. A catheter is a small tube designed to be inserted into the bladder to drain the contents thereof when the bladder no longer empties voluntarily. There are two major types of catheters: 1.) Indwelling, and 2.) Intermittent.

An indwelling catheter remains in the body and urine collects either in a bag or a discreet leg-bag and is emptied periodically throughout the day. The two most common types of indwelling catheters are differentiated by their point of entry to the bladder. A standard indwelling catheter, also referred to as a Foley, enters the body through the urethra and requires changing every 30 days. A suprapubic indwelling catheter enters the bladder through the skin just above the pubic bone, and is placed by a urologist in an outpatient procedure. Just like the standard catheter, a suprapubic catheter must be changed every 30 days to maintain bladder health.

With intermittent catheterization protocol (ICP) the catheter is briefly inserted into the bladder to empty it and then the catheter is removed and discarded. Since the catheter does not remain in the body leaving the urinary system constantly exposed to bacteria, this method of bladder management often reduces the risk for urinary tract infections (UTIs) and kidney damage if completed using a proper clean technique.

When using the ICP technique it is of utmost importance to always use a clean technique to avoid UTIs and possibly kidney damage. If a clean technique is not used, the catheter may pick up bacteria on the skin and deposit it in the urethra (the channel between the bladder and the outside of the body) or the bladder as it is being inserted. This bacteria will grow and multiply in the urine if it remains in the bladder for a prolonged period of time and will likely lead to a UTI and/or kidney damage.

To avoid UTIs and kidney damage, follow this clean ICP technique and be sure to empty the bladder on a regular basis while monitoring urine volume and daily hydration.

### **ICP TECHNIQUE:**

- 1.) Prepare and gather equipment
  - New sterile catheter
  - Soap and water
  - Clean washcloth
  - Water-soluble lubricant
  - Urinal (if measuring urine volume)
- 2.) Prepare clothing. Make sure you have adequate light to see what you are doing, and ensure that clothing is away from your body.
- 3.) Apply water-soluble lubricant to the first 2-3 inches of the catheter.
- 4.) Place urinal in appropriate location if emptying the bladder into a urinal for measuring volumes. (If you are emptying directly into a toilet, make sure you are close enough to the toilet prior to beginning setup so that you will not have to reposition yourself once the clean environment has been created.)
- 5.) Wash your hands well with soap and water.
- 6.) Wash the urinary opening thoroughly with soap and water and reach with clean water.
- 7.) Insert the catheter slowly about 2-3 inches, making sure you do not allow the catheter to come in contact with anything other than your urinary opening.
- 8.) Once the urine starts to flow, advance the catheter approximately 1 inch, if you feel any resistance, stop for a moment, take a deep breath, and gently resume insertion.

## The Quick and Dirty About Keeping It Clean: Clean Technique for Self-Catheterization cont.

9.) Place the opposite end of the catheter in the urinal (or toilet, if emptying directly into the toilet) as soon as you see urine begin to flow and allow all the urine to drain from the bladder.

10.) After the urine flow stops, gently remove catheter and discard.

This protocol, when followed carefully will help to reduce your risk of UTIs and possible kidney damage.

A few tips to remember when completing ICP:

- Never reuse a catheter.
- Always use water-soluble lubricant. Do not eliminate this step or substitute other possible lubricants.
- Catheterize at a minimum of every 6 hours to prevent your bladder from overflow.
- Maintain bladder volumes between 300-400 cc (1 to 1-1/2 cups)
- Hydrate regularly; do not dehydrate yourself to prevent the need for self-catheterization.
- Maintain regular appointments with a urologist that specializes in neurogenic bladder management.

For your overall health and well-being, it is also important that you know the signs and symptoms of a UTI. If you suspect you may have a UTI, do not wait for it to clear on its own, contact your healthcare provider right away. The following are signs and symptoms of UTI:

### SIGNS:

- Sediment or mucus in your urine that may make it cloudy.
- Bad (foul) smelling urine \*\*
- Blood in urine (urine may be pink or red in color) \*\*

### SYMPTOMS:

- Fever
- Chills
- Leakage or voiding between catheterizations
- Increased muscle spasms of the legs, or bladder
- Feeling the need to catheterize more often (frequency) or quickly (urgency)
- Burning of the urethra, penis, or pubic area
- Nausea
- Headache
- Feeling "lousy" or tired

\*\* Note: You may have changes in the color or smell of your urine based upon your diet (ever noticed what happens to your urine after eating beets or asparagus?). Changes to the color or smell may not always indicate you have a UTI. Also watch for symptoms along with the signs, and if ever in doubt, call your healthcare provider.



### **FES BIKE**

Arms not getting enough exercise? Use your legs to exercise your heart and improve cardiovascular fitness with the Community Functional Electrical Stimulation (FES) Bike Program.

Call St. Luke's Outpatient Therapy at 509-473-6869 for more information.

Participants will be assessed and trained, along with their caregiver. Training is by a Physical Therapist. In 5-10 visits participants will be able to perform independently.

Offered 2-3 days per week

\$35 dollars per month

### **SUPPORT GROUP**

The SCI support group meets every 4th Wednesday from 1-2p.m. Please check in at the front desk for the room, as the location changes on occasion. The SCI support group facilitates an opportunity to interact and network with peers living with spinal cord related injuries and deficits. Family and friends are always welcome.



Inland NW Health Services  
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Return Service Requested



## VISION STATEMENT

Be nationally recognized as the regional rehabilitation center of choice based upon reputation, quality outcomes and innovative care.

## MISSION STATEMENT

Our mission so to be a resource for health and wellness in order to optimize the potential for a full and productive life. WE serve individuals and their families requiring expertise in medical rehabilitation.

St. Luke's Rehabilitation Institute seeks to provide value to those served by treating the whole with regard to physical, intellectual, emotional, cultural, and spiritual needs in order to restore to their fullest potential the capacity for living. Excellence of care will take place in an atmosphere of compassion, reverence and integrity.

St Luke's is a division of Inland Northwest Health Services (INHS). INHS is a non-profit corporation in Spokane, Washington providing collaboration in health care services on behalf of the community.