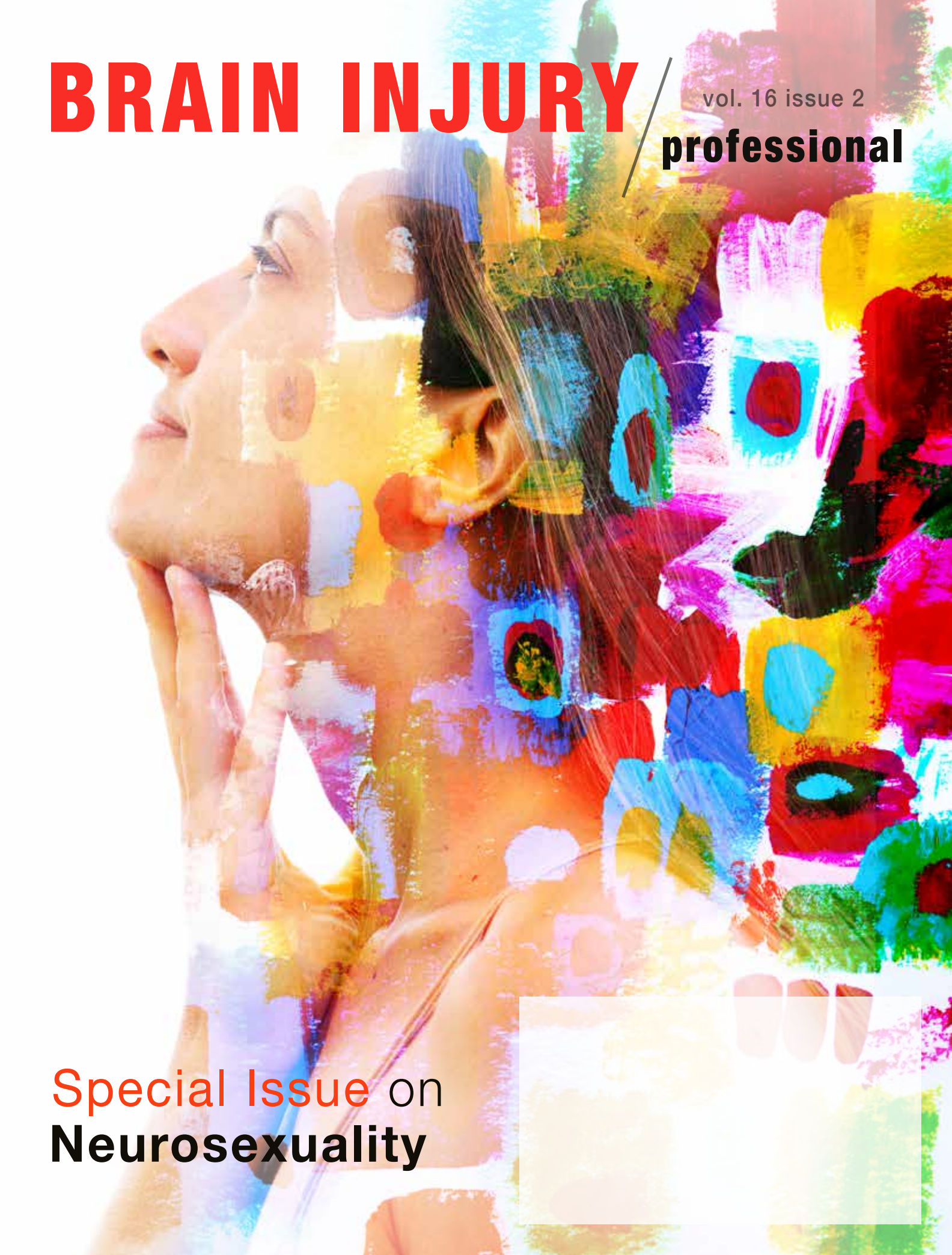
BRAIN INJURY

vol. 16 issue 2

professional



Special Issue on **Neurosexuality**

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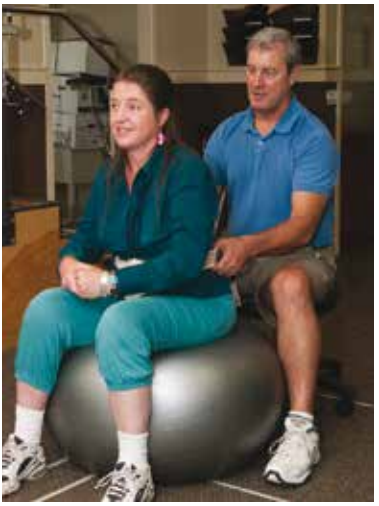

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BRAIN INJURY professional

vol. 16 issue 2

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Brain Injury Professional is a membership benefit of the North American Brain Injury Society and the International Brain Injury Association

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Managing Editor
Brain Injury Professional
PO Box 131401, Houston, TX 77219-1401
Tel 713.526.6900 Email: mbell@hdipub.com
Website: www.nabis.org

ADVERTISING INQUIRIES
Megan Bell-Johnston
Brain Injury Professional
HDI Publishers
PO Box 131401, Houston, TX 77219-1401
Tel 713.526.6900 Email: mbell@internationalbrain.org

NATIONAL OFFICE
North American Brain Injury Society
PO Box 1804, Alexandria, VA 22313
Tel 703.960.6500 / Fax 703.960.6603
Website: www.nabis.org
ISSN 2375-5210

Brain Injury Professional is a quarterly publication published jointly by the North American Brain Injury Society and HDI Publishers.

from the editor in chief

Nathan D. Zasler,
MD, DABPM&R, FAAPM&R,
FACRM, BIM-C, CBIST

I am very pleased to introduce this issue of *Brain Injury Professional* on "Neurosexuality". Our guest editor for this special issue is Dr. Alexander Moreno from the Universite de Montreal has already established himself early in his career as someone who is doing cutting edge research in the area of sexuality and TBI. He has also distinguished himself as an advocate in this area for those with neurodisability. The topic of sexuality often does not get the attention it deserves and as someone who has been a staunch promoter of inclusion of sexuality related issues in the context of brain injury neurorehabilitation, I am delighted to see this issue come to fruition under Dr. Moreno's guidance.

Dr. Moreno has put together a diverse set of both authors and topics for this issue of BIP. Although it would be impossible to discuss all the relevant information on this topic in one issue, readers will have an opportunity to get a flavor for the breath of some of the issues pertinent to both adult and pediatric neurosexuality following ABI. These issues range from neuromedical to rehabilitative and beyond including legal, moral and ethical issues. The expert interview with Dr. Graham Simpson from Australia also provides readers with some valuable insights from a professional who has dedicated his career to this important area of human function post TBI and acquired brain injury in general.

We hope that this issue of *Brain Injury Professional* provides some insights and serves to improve the care of those with ABI across all settings and geographies.

The upcoming NABIS 15th Annual Conference on Brain Injury, also known as ABI2020, will take place in New Orleans at the Roosevelt Hotel on February 26 - 29, 2020. The overall conference theme is Best Practices in Brain Injury Medicine and Neurorehabilitation: Improving Outcomes Through Interdisciplinary Collaboration; this meeting will play a vital role in bridging the gap between brain injury research and clinical practice. Currently there is a call for abstracts which is due August 15, 2019. For more information, please visit abi2020.org.

Nathan D. Zasler, MD, DABPM&R, FAAPM&R, FACRM, BIM-C, CBIST
Chief Editor, *Brain Injury Professional*

Author Bio

Nathan Zasler, MD, is an internationally respected physician specialist in acquired brain injury (ABI) care and rehabilitation. He is CEO and Medical Director of the Concussion Care Centre of Virginia, an outpatient neurorehabilitation practice, as well as, Tree of Life, a living assistance and transitional neurorehabilitation program for persons with acquired brain injury in Richmond, Virginia. He is board certified in Physical Medicine and Rehabilitation and fellowship trained in brain injury, as well as, Brain Injury Medicine certified.

Dr. Zasler is an Adjunct Professor of PM&R at VCU in Richmond, Virginia, as well as, an Adjunct Associate Professor of PM&R at the University of Virginia, Charlottesville, Virginia. He is a fellow of the American Academy of Disability Evaluating Physicians, and a diplomat of the American Academy of Pain Management.

Dr. Zasler has lectured and written extensively on neurorehabilitation issues in ABI. He is active in national and international organizations dealing with acquired brain injury and neurodisability, serving in numerous consultant and board member roles including currently serving as Vice-Chairperson of IBIA.

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from the guest editor

Alexander Moreno, PhD

Neurosexuality is a framework for the scientific study of the relationships between sexuality and the brain. Neurosexuality focuses on the study of the interactions between the brain and sexual function in individuals with and without neurological disorders. Neurosexuality has been gaining relevance in research and clinical practice because healthcare professionals and researchers are increasingly acknowledging the importance of sexuality in neurorehabilitation. For instance, between 9 to 75% of individuals with different neurological disorders experience sexual problems. Individuals with acquired brain injury (ABI) clearly express that they want an open discussion about their sexuality during rehabilitation. As such, clinicians need to efficiently respond to their needs from a comprehensive perspective of neurorehabilitation. This special thematic number reflects the transdisciplinary interest in this emerging area of research and practice. The current special issue provides complementary perspectives from nursing, medicine, neuropsychology, law, occupational therapy, and social work.

The feature article presents clinical recommendations in pediatric neurosexuality from a nursing perspective. Promoting healthy sexuality in children and youth with ABI is one of the greatest challenges in the rehabilitation of children and adolescents post-injury. This action-oriented article will help practitioners to implement concrete strategies in their practice to adopt a positive approach to sexuality in this population.

From a medical viewpoint, the first supporting article explores the role of hippocampal neurogenesis in neurosexuality. Neurogenesis supports the use of a biopsychosocial perspective of sexuality in neurorehabilitation. As the hippocampus is involved in different psychological processes and sexual behavior, rehabilitation interventions promoting neurogenesis of the hippocampus can have both a direct and an indirect impact in the rehabilitation of sexuality.

The neuropsychological perspective of this special thematic issue brings attachment theory as a dimension that is frequently omitted in the neurosexuality literature. Psychosexual work in couples following ABI can be facilitated by attachment theory to address the emotional and relational disconnection resulting in changes in couple's intimacy post-ABI. Building positive interactions in a couple and enhancing the communication of emotional needs post-injury are some of the benefits of this approach.

The legal perspective explores the controversies of sexual surrogacy in the context of the neurosexuality of traumatic brain injury (TBI). For both the rehabilitation professionals and individuals with TBI accessing sexual rehabilitation, there is an ongoing discussion about the benefits, boundaries, limitations, and scope of this type of intervention. The reflection on legal aspects is closely intertwined with personal and professional ethics, human rights, personal and societal values, and the goals of neurorehabilitation.

Occupational therapists working on TBI and stroke are often confronted with sexual difficulties in their practice. The article presents operational aspects based on a theoretical and clinical perspective of neurosexuality in these two forms of ABI. From a biopsychosocial approach, the role of occupational therapists in the identification and treatment of sexual problems post-ABI is highlighted, as well as the orchestration of the contribution of other rehabilitation disciplines at different times of the rehabilitation continuum.

Our expert interviewee is the author of the "You an Me" Sex Education Program, which is the only program showing evidence of success to address sexuality concerns in individuals with TBI. From the perspective of social work, the author reflects on the importance of neurosexuality in rehabilitation, the strategies to open a discussion about sexuality with individuals with ABI, the need to develop local and international collaborations to create new interventions, the current research trends, the role of emerging technologies, and the prospective challenges of neurosexuality.

Transdisciplinarity provides a unique opportunity to address complex problems and promoting the inclusion of different perspectives is vital to gain a deeper comprehension of sexuality and disability. Together, the transdisciplinary perspectives presented here provide a comprehensive picture of neurosexuality, increasing the understanding of its theoretical underpinnings and its applications in clinical practice. In this special issue, the readership of Brain injury Professional will find the opportunity to explore different viewpoints to improve their understanding of sexuality post-ABI. I hope that this special thematic number succeeds in helping the readers to initiate a conversation about sexuality with their clients with ABI, to increase the knowledge base in this area, and to help us remember that sexuality is another dimension of rehabilitation that we must address to contribute to the overall improvement of the quality of life of our clients.

Author Bio

Alexander Moreno, PhD, is a licensed Clinical Neuropsychologist/Psychologist member of the College of Psychologists of Quebec (Ordre des Psychologues du Québec, OPQ) in Canada and the College of Psychologists of Colombia (Colegio Colombiano de Psicólogos, COLPSIC). Currently, Dr. Moreno is an adjunct professor in the Department of Psychology at Université de Montréal and works as a Clinical Neuropsychologist/Psychologist at Notre-Dame Hospital in Montreal (CIUSSS du Centre-Sud-de-l'Île-de-Montréal). For several years, he has been working in the areas of sexuality and neurodisability. He has authored numerous peer-reviewed scientific and review articles in the areas of health psychology, neuropsychology, sexuality, and neurorehabilitation. Dr. Moreno leads a new area of research and practice known as neurosexuality, based on a transdisciplinary approach to sexuality in neurorehabilitation. As a researcher and clinician, he advocates for the inclusion of sexual rehabilitation in individuals with brain injuries and their families.

Promoting Healthy Sexuality in Children and Youth with Acquired Brain Injury Through Sex Positive Conversations

Caron Gan, RN, MScN, RP, RMFT, AAMFT

Sexuality changes are common after acquired brain injury (ABI) and these voices reflect the questions and concerns that are commonly experienced by adolescents and their parents; yet sexual health is a neglected area of intervention and research, especially in children and youth (CY) with ABI (Moreno, McKerral, Lasprilla, & Gan, 2013; Simpson, Simons-Coghill, Bates, & Gan, 2017). This gap in clinical care and research is notable given that ABI is the leading cause of disability and death amongst children, adolescents and young adults (CDC, 2016). To negotiate the transition to becoming a sexually healthy young adult, CY with ABI need accurate information and education about sexual health and the possible impact of their ABI. Yet studies show that youth with ABI are rarely asked about their sexual feelings, concerns, or questions (Simpson et al., 2017). There is a tendency for parents and healthcare professionals to rely on 'someone else' to the address sexual health needs of youth with disabilities (East & Orchard, 2014a). As a result, CY do not always receive the information that they need to gain the knowledge and skills required to make informed decisions about their sexual health and intimate relations.

The purposes of this paper are twofold:

1. to highlight the importance of addressing the sexual health needs of CY with ABI and
2. to offer ways that rehabilitation professionals can facilitate conversations to promote positive sexual health.

Voices of teens with acquired brain injury (ABI)

"I have an ABI but the sex education program at school can't help me. I walk and move different now and don't know how I can have sex."

"Will I be able to have babies?"

"Will people still like me because of my ABI?"

"I don't want anyone to know I have an ABI – they'll think I'm stupid."

"I think I'm bisexual – is that because of my ABI?"

"Who do I talk to about friendships, dating, and sex?"

Voices of parents of teens with ABI

"As a parent, how can I help my teen make safe choices?"

"I worry that people will take advantage of her."

"Since the ABI, he's more naïve and I'm afraid he'll get himself into trouble."

Sexual health - What is it?

Sexual health is not just about being male or female, or the act of sex. It's also about relationships and how we feel about our bodies, ourselves and others. Sexual health is defined holistically as… a state of physical, emotional, mental and social well-being in relation to sexuality. It requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence (World Health Organization, 2006, p. 5). Inherent in this definition is the importance of moving beyond the physical aspects of sexual health and helping CY establish a foundation for relationship-building and caring for others to pave the way for healthy intimacy.

Why is promoting positive sexual health in CY with ABI important?

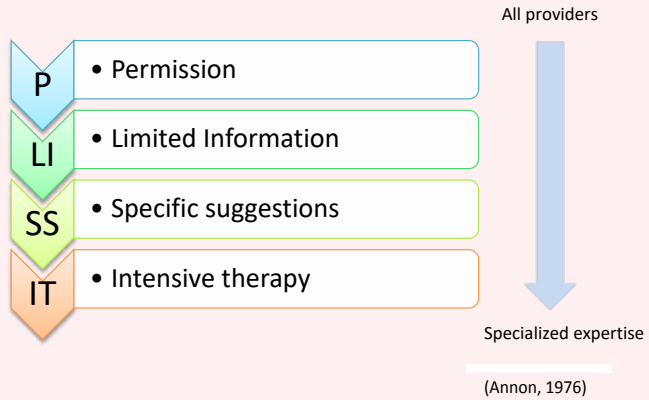
1. CY with ABI are sexual beings like everyone else. Being sexual is a natural, pleasurable, and healthy part of a person's life and closely linked to other aspects of socio-emotional well-being. Yet, youth with disabilities are often portrayed as childlike, dependent, naïve, and in need of protection (East & Orchard, 2014b). As a result, important topics such as sexuality, self-image and identity formation are often ignored or overlooked by the adults in their lives.
2. The consequences of ABI are wide-ranging and can include physical changes (i.e. motor difficulties, fatigue, pain), cognitive challenges (i.e. problems with distractibility, attention, communication), behavioral challenges (i.e. impatience, irritability, disruptive behavior), and emotional difficulties (i.e. mood disturbance, anxiety, emotional distress) (Savage, Depompei, Tyler & Lash, 2005). As a result, CY with ABI may struggle with fitting in with their peers, forming and maintaining friendships, and figuring out their identity while trying to navigate the complexities of life with an ABI.
3. CY with ABI don't have the usual support systems for addressing their unique sexual health needs or questions about relationships. Compared to peers without ABI, CY with ABI are three times more likely to attempt suicide and roughly twice as likely to be bullied at school or online, to bully others, to seek help from a crisis help line, or to be prescribed a medication for depression, anxiety, or both (Ilie et al., 2014).
4. Sexuality may be an area that is uncomfortable for parents and CY to discuss openly with one another. Parents may feel protective and be less inclined to broach the topic. Viewing their child as a sexual being may be a departure from their priorities and concerns related to the child's ABI.
5. Sexuality is an area that is seldom addressed by professionals after pediatric ABI (Simpson et al., 2017). Research has also found that individuals with ABI experience lack of openness from professionals for questions related to sexual and reproductive health (Moreno, Gan, Zasler, & McKerral 2015). Similarly, youth with disabilities are rarely asked about their sexual feelings, concerns and questions, which in turn can contribute to an overall taboo surrounding sexuality issues and disability (East & Orchard 2014a).

Like their similar aged peers, CY with ABI often have questions about dating, readiness to have sex, sexual orientation, relationships, or LGBTQIA+ concerns (LGBTQIA+ stands for Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, Asexuality, + refers to all other sexualities and forms of gender expression not covered by these letters). They may, however, lack confidence in making friends, or wonder if others will find them attractive after the ABI. CY with ABI need to know to whom they can talk so that they are sexually informed, know what to do to ensure safety and avoid unwanted behaviours, and receive support in forming satisfying and healthy relationships (Gan, 2018).

Framework for Promoting Sex-positive Conversations

The PLISSIT model is a framework that can help foster conversations around positive sexual health with CY and their families. PLISSIT is an acronym for Permission, Limited Information, Specific Suggestions and Therapeutic Intervention (Annon, 1976). The PLISSIT model is illustrated in FIGURE 1.

FIGURE 1: PLISSIT Model



(Annon, 1976)

The first level, **Permission**, does not require specialized knowledge or skills in sexual rehabilitation. Instead, it involves creating an atmosphere where the CY feels comfortable broaching questions around relationships and sexuality. Research shows that a high percentage of young people want guidance around preparing for caring, lasting romantic relationships and are anxious about developing them. Yet they get little or no guidance around relationships (https://mcc.gse.harvard.edu/reports/the-talk), especially as it applies to ABI. Creating a safe and non-judgmental place to ask questions and giving CY permission to talk about relationships, their changing bodies, or sexual health concerns will set the stage for promoting positive sexual development. Instead of taking a reactive approach, it is important for healthcare providers to be proactive by initiating discussions, acknowledging the importance of this topic, and providing opportunities for dialogue using adolescent-friendly language.

Limited Information can be provided through booklets, brochures, web resources, discussions or educational sessions. Intervention at this level can help to normalize the CY's concerns, dispel common misconceptions, and ease anxieties. As there are limited ABI specific resources, this next web resource offers helpful tips for parents of children with disabilities. Guidelines are offered around how they can support their child's social and sexual development throughout the different developmental stages (https://teachingsexualhealth.ca/wp-content/uploads/sites/4/Sexual-and-Development-Disablity-Guide-2016.pdf).

Although not ABI specific, mainstream resources can also be helpful to facilitate discussion on healthy relationships (i.e., https://thewalrus.ca/five-teens-on-what-does-a-healthy-relationship-look-like-to-you/). General information on sexual and reproductive health (e.g., contraception, safer sex practices, STIs) can also be provided through mainstream web resources (http://teenhealthsource.com ; http://www.sexandu.ca).

Specific Suggestions include counseling and treatment strategies that address the unique needs of the CY with ABI. These suggestions can be specific to a particular professional discipline. For example, a sexual health educator or primary care physician can provide information around appropriate birth control options. A speech and language pathologist might support strategies around social pragmatics and conversation starters. A neuropsychiatrist can make medication adjustments to address behaviour or mood changes. A family therapist can offer assistance to parents around best ways to safely support the CY through the developmental changes of adolescence.

Finally, **Intensive Therapy** is offered to individuals who require the expertise of a sexuality expert, sex therapist, or specialist in sexual rehabilitation. Examples include an endocrinologist for a CY with precocious puberty, a gender identity clinic for gender identity issues, or a trauma therapist to help around previous or current sexual abuse.

How Rehabilitation Professionals Can Help

In helping CY in their journey towards optimal sexual health, it is important not to assume that he/she understands about healthy boundaries and relationships or what healthy sexuality is. Rehabilitation professionals working with CY with ABI can be proactive in promoting positive sexual health by:

- Beginning the conversation and giving permission for CY and their parents to ask questions and talk about this important topic. Create openings to normalize any concerns the CY might have about sexual health (e.g., It is common for teens to think about relationships and sexuality after an ABI. Are there things that you've been wondering about that you would like to ask?). Even if the CY does not bring up any questions, provide repeated opportunities to have normalizing conversations about peer pressure, relationships, consent, and social media use.

- Starting the conversation early. Children of all ages need to be taught about healthy boundaries, including how to be the 'boss' of their body and that nobody gets to touch them without their permission. Mainstream resources such as this YouTube video can be a fun and normalizing way of broaching the subject early on (https://www.youtube.com/watch?v=zAALZxa6NCw&feature=youtu.be).

- Supporting parents around the importance of opening the lines of communication early on with their children. Adolescents, who have open and responsive communication with parents have been found to be less influenced by peers, are more likely to delay sexual activity, and have fewer sexual partners (Best & Fortenberry, 2013). Parents may need support around how to broach the topic with their teen and using teachable moments to foster positive sexual health conversations. For example, parents can talk about examples of healthy and unhealthy relationships in their own family or through television programs. Parents can ask questions such as: Which relationships are healthy? Which ones are harmful? How can you tell? What should that person do? Encourage parents to have the same conversations as they would with a child who does not have an ABI. These include discussions around values, dating, dealing with peer pressure, personal safety, friendships, online safety, etc.

- Providing a safe space for the CY to ask questions about gender identity and sexual orientation. Having an ABI during adolescence often brings about concerns related to self-esteem, self-identity, and self-image. Questions about sexual orientation or gender identity can add further to these insecurities. Research has found that LGBTQIA+ people with neurodisabilities and their families can conceal their sexual orientation or gender identity for fear of diminished quality of care (Moreno, Laoch, & Zasler, 2017). Similar to giving permission, it is important to use open-ended questions to create a safe, non-judgmental space for the CY to share concerns or ask questions (e.g., What questions do you have about your sexuality?). The key is to convey an attitude of openness and acceptance. Collaborating with or referring the CY to mainstream LGBTQIA+ resources may be another consideration if more specialized support can be helpful.

- Providing group opportunities for role-playing to foster healthy relationship skills and social interaction. Meeting people, choosing friends, starting a conversation, being a good listener, being respectful, handling rejection, dealing with break-ups, and learning appropriate boundaries are some of the social skills that may need to be taught or rehearsed in a group setting.

- Offering workshops on healthy relationships (i.e. healthy boundaries, sexual consent, identifying red flags in relationships, how to say 'no' to unwanted behaviours and how to say 'yes' to desired behaviours). Concurrent workshops can be held for the parents to support them in their role in fostering their child's healthy sexual development.

- Having conversations around cyber safety – Social networking has become an important method for adolescents to connect, socialize, as well as build identity and self-expression. While social networking provides opportunities to connect with peers and enhance one's group identity, this form of communication can also present risks and disadvantages. According to Canada's largest ongoing student survey of adolescents in Ontario, 86% of students visit social media sites daily (CAMH, 2018). The link between increased social media use and depressive symptoms was also found, especially for girls aged 12-18 years. Researchers found that 61 per cent of girls who used social media for more than five hours a day indicated moderate to serious psychological distress, compared with 33 per cent of boys (CAMH, 2018). One-in-five (21%) students also report being bullied over the internet (CAMH, 2018). In another survey of adolescents and young adults, 37% of adolescent females and 40% of adolescent males have sent or posted sexting messages (Best & Fortenberry, 2013).

Instead of taking a reactive approach, it is important for healthcare providers to be proactive by initiating discussions, acknowledging the importance of this topic, and providing opportunities for dialogue using adolescent-friendly language.

Let us be proactive by beginning the conversation, legitimizing the importance of this topic, and providing equal opportunity for CY with ABI to acquire the knowledge and skills they need to engage in fulfilling, respectful, and healthy relationships.

Given the social and mental health vulnerabilities of CY with ABI, clinicians should adopt a proactive and positive approach around safe use of social networking. There may be untapped potential for rehabilitation professionals to incorporate supported use of social media into functional rehabilitation goals (e.g. building safe online presence, developing healthy virtual relationships, mitigating risks of exploitation and cyber bullying (Wiseman, et al., 2019).

- Maintaining open lines of communication and providing opportunities for private discussion by using a non-judgmental, positive stance so that the CY will feel comfortable raising concerns or questions. Start off with sex positive messages before getting into the risks, dangers, or concerns. Since research has found that concerns around confidentiality are the primary reason why adolescents do not seek counselling related to sexual health (East & Orchard 2014a), ensure that CY have the opportunity to meet privately with rehabilitation staff so that they can openly discuss issues that may be too sensitive or awkward to bring up in the presence of parents.

To safely negotiate the transition from childhood to adolescence and into young adulthood, CY need to be supported in finding positive and healthy ways to express their sexuality. They need to know whom they can talk to about their changing bodies and relationships and how they feel about the changes arising from their ABI. Like all CY, they need to know how to make healthy choices so that they can safely navigate this important stage of life and develop healthy and satisfying relationships.

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Author Bio

Caron Gan, RN, MScN, RP, RMFT, AAMFT Approved Supervisor, is an Advanced Practice Nurse, Registered Psychotherapist, Registered Marriage and Family Therapist, and Certified Clinical Traumatologist. For the past 28 years, she has worked at Holland Bloorview Kids Rehabilitation Hospital, providing psychotherapy and family therapy intervention to children, youth, adults, and families living with the effects of acquired brain injury. Through her cross appointment to the Bloorview Research Institute as a Clinical Team Investigator, she has led research studies focusing on family interventions and family needs after pediatric brain injury. Scholarly activities include numerous publications in peer-reviewed journals as well as four book chapters on family assessment and intervention after brain injury. She has delivered over 100 keynote and invited presentations at international and professional conferences on topics related to family needs, family interventions, and sexuality after brain injury.

Hippocampal Neurogenesis: A Basis for Sexual Therapies after Traumatic Brain Injury?

M. Elizabeth Sandel, MD

A biopsychosocial approach offers the most promise for helping people with traumatic brain injury (TBI) address sexual concerns and difficulties. This comprehensive approach, delivered by a team of rehabilitation professionals, encompasses medical and physical issues, psychological and neuropsychological effects, and relationship changes that occur after a TBI. (Moreno, et al., 2013). The thesis of this brief and theoretical review is that hippocampal neurogenesis provides a scientific basis for a biopsychosocial approach to treating sexual concerns and difficulties after TBI.

Research laboratories using neuroimaging and other advanced technologies are now uncovering many details about human neurogenesis in this brain region. There is hope that these discoveries will lead to treatments for people with neurologic and psychiatric disorders (Bergmann, et al., 2015). We know that a program of exercise, treatment of mood disorders, and adequate sleep can improve outcomes through effects on hippocampal neurogenesis. These beneficial effects can have indirect effects on sexual functioning. Could sexual therapies improve outcomes even further through direct effects on neurogenesis?

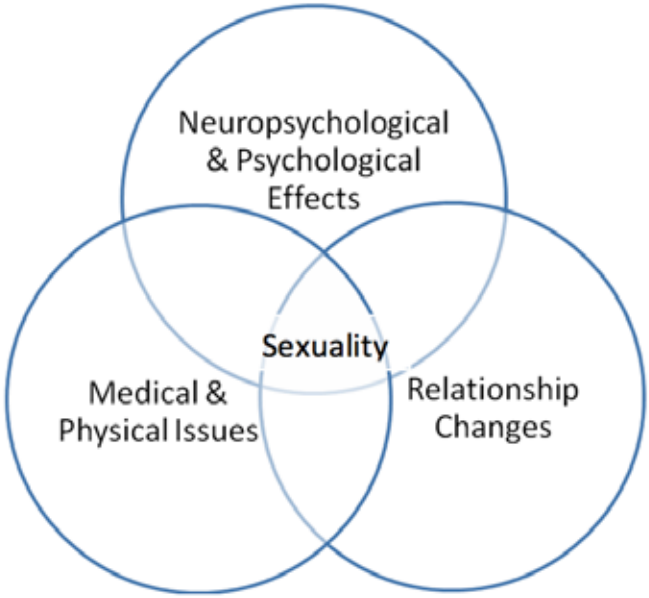

FIGURE 1. Biopsychosocial Model of Sexuality, Gan 2005. Reprinted from NeuroRehabilitation, 32(1), Moreno, A., Arango-Lasprilla, J., Gan, C., & McKerral, M. Sexuality after traumatic brain injury: a critical review, 69-85, Copyright (2013), with permission from IOS Press.

The Hippocampus

The seahorse-shaped structure in the temporal lobes called the hippocampus has been an intense focus of animal and clinical research for decades. Research on neurogenesis, the birth and maturation of new neurons in the brain, accelerated after the discovery of adult-born neurons in the hippocampal cells of cancer patients in the 1990s (Erickson et al., 1998). Cell proliferation, differentiation, migration, and survival play procedural roles in neurogenesis (Kemperman et al., 2015). Immune responses, such as the activities of microglial cells, likely regulate neurogenesis (Kohman et al., 2013). Steroid hormones (estrogen, testosterone, and glucocorticoids) enhance neurogenesis (Duarte-Guterman et al., 2015).

The temporal lobes are often sites of traumatic injuries, and measures of the duration of post-traumatic amnesia (the lack of ability to lay down memories on an ongoing basis after a brain injury) may reflect the effects of hippocampal cellular processes (Marshman et al., 2013). When the brain is subjected to a forceful impact, even at a distance remote from the hippocampus, there can be microscopic evidence of injury (Kotapka et al., 1992). The hippocampus is also vulnerable to hypoxic insults, ischemic injury, and alcohol (McGrath et al., 2017). A neuroinflammatory response that activates microglia and cytokines can alter cognitive and other brain functions (Kohman et al., 2013).

Despite the vulnerability of the hippocampus, promising evidence from a growing body of animal and clinical research suggests that certain human activities and rehabilitation interventions promote neurogenesis. Exposure to an enriched environment, such as that provided by cognitive and physical therapies, certain pharmacologic agents for mood disorders, exercise, and regulation of sleep-wake cycles, may enhance recovery after brain injury through the processes of neurogenesis (Olson et al., 2006; Garcia et al., 2011).

Cognition and Mood

The dentate gyrus of the hippocampus contains progenitor cells that can become mature granule or glial cells, given the right conditions. These cells provide the basis for laying down new memories, giving the hippocampus a primary role in learning. Hippocampal neurons provide the basis for declarative and episodic memory and for spatial, contextual, and relational memory formation. The hippocampus is sometimes referred to as the brain's librarian or flash-drive because it consolidates short-term memories and catalogues these memories for retrieval. Brain-derived neurotrophic factor (BDNF) and certain neurotransmitters are implicated in hippocampal-dependent learning and memory consolidation (Shors et al., 2012).

The hippocampus is vulnerable to stressful triggers as well as trauma. Chronic stress can lead to a decrease in cell proliferation, and depression-like behaviors may result. The hippocampus maintains reciprocal connections with various brain regions associated with emotional regulation, such as the amygdala and prefrontal cortex. Certain "anxiety cells" have been identified in the hippocampus, linking it to mood states and post-traumatic stress disorder (Jimenez et al., 2018). Antidepressants can promote neurogenesis in the hippocampus by increasing progenitor cells, leading to improved mood in people with major depression (Lucassen et al., 2015).

Sleep and Exercise

The scientific community has also discovered that the hippocampus plays an important role in sleep.

Sleep deprivation, especially prolonged REM and NREM reductions, decrease hippocampal cell proliferation. The result may be a major decrease in hippocampal neurogenesis. Sleep deprivation affects memory and mood, perhaps because of its effect on neurogenesis (Meerlo et al., 2009).

Aerobic exercise promotes the expression of BDNF, which then promotes neurogenesis. There is evidence that ketones, generated by the liver during exercise, may facilitate the effects of BDNF through epigenetic mechanisms. The effects of exercise extend to improved cognition and mood and regulation of sleep-wake cycles, through BDNF and other biochemical and gene-expression-related cellular activities involved with neurogenesis (Sleiman et al., 2016).

Binge ethanol exposure significantly decreases the volume of the dentate gyrus and the number of granule neurons in the hippocampus. However, in a study of binge-exposure in rodents, exercise completely restored the baseline volume and granule neuron numbers in the hippocampus following that exposure. This suggests that exercise is potent in its ability to reverse hippocampal damage by promoting natural self-repair processes (Maynard et al., 2013).

Emotional and Sexual Functioning

A substantial body of animal research provides evidence that sexual activity may enhance memory through biological effects on neurogenesis. A recent study of female heterosexual college students suggests that penile-vaginal intercourse is associated with enhancement of verbal memory (but not memory for faces). Thus, there is evidence of a link between sex and cognitive function through hippocampal neurogenesis (Maunder et al., 2017).

The neurohormones oxytocin and arginine vasopressin, released by the posterior pituitary gland, have chemically-similar structures. They have receptors in the amygdala, anterior cingulate, hypothalamus, and other regions of the central nervous system. Both neurohormones are thought to enable empathy and altruism through various neuronal processes. Oxytocin is also believed to enable neuronal processes that involve social bonding and attachment, trust, and interpersonal communication. Levels rise during sexual activity and orgasm as well as during birth and breast-feeding. Vasopressin is thought to modulate emotional reactivity, stress, and anxiety, although differently in men and women (Bachner-Melman et al., 2015).

There is yet another link between the limbic system and social and sexual behaviors. It turns out that the hippocampus is involved with social learning and cataloguing of social memories, not just cognitive memories. Amar Sahay and fellow researchers at Harvard's Stem Cell Institute found that social recognition and social interactions are regulated, at least in mice, by a network of neurons in the dentate gyrus of the hippocampus. When oxytocin receptors in the dentate gyrus were deleted, mice could differentiate inanimate objects, but could not distinguish unknown from known mice. The dentate gyrus neurons connect with a posterior hippocampal region and to the nucleus accumbens. The nucleus accumbens governs social behaviors and plays a role in addiction, pleasure, reward-seeking, and aversion. It is an area of the brain tied to other social decision-making, such as the selection of sexual partners (Raam et al., 2017).

Future Treatment and Research

A growing body of research offers good news concerning the brain's ability to recover from trauma through hippocampal neurogenesis. Neurogenesis-based rehabilitation strategies such as cognitive therapies, exercise, sleep aids, and psychological treatments can indirectly impact social and sexual functioning.

However, more direct interventions to improve the social and sexual relationships of people with TBI must be part of a scientifically-based treatment strategy. Although much more research is needed, the hippocampus and its capacity for neurogenesis provide us with a new and promising scientific rationale.

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Author Bio

M. Elizabeth Sandel, MD, is a medical director for Paradigm, which leads the Workers' Comp industry in solving complex health care challenges and improving lives. She is board-certified in physical medicine and rehabilitation and brain injury medicine. She is also a Clinical Professor in the Department of PM&R at the University of California Davis School of Medicine. Dr. Sandel has practiced medicine in healthcare systems on the East and West Coasts, including the Jefferson Health System, the University of Pennsylvania Health System, and Kaiser Permanente Northern California. Funding from the Centers for Disease Control and Prevention, the National Institutes of Health, and Kaiser Permanente has supported her research on brain injury and stroke. Dr. Sandel served on the Board and as President of the American Academy of Physical Medicine and Rehabilitation, and the AAPM&R awarded her the Krusen Lifetime Achievement Award in 2012.

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The Use of Attachment Theory to Inform Psycho-Sexual Couples Work in Neuro-rehabilitation

Giles Yeates, DClinPscych, MSc, AFBPS

Introduction

The recognition of changes in sexual functioning for survivors of acquired brain injury (ABI) has grown and the nature of such clarified (e.g, Moreno et al., 2013; Ponsford, 2003). Psycho-educational interventions have been suggested to support survivors themselves (e.g., Simpson, 2001), and the application of techniques such as Sensate Focus (Masters and Johnson, 1976) from the wider psycho-sexual therapy field have been explored in the ABI field. Here the significance of the emotional dimension for the planning and implementation of psycho-sexual work with couples following ABI will be explored, using the framework of attachment theory (AT, Bowlby, 1969). Psycho-sexual work with survivors who are not in a romantic relationship will not primarily be considered here, although an attachment-focused perspective has relevance (e.g., the impact of isolation, rejection, and acquired problems during sexual encounters for a survivor's self-identity, mood and ability to use emotionally-significant relationships to regulate their distress).

Identifying and conceptualising Sexual and Relational Disconnection Post-Injury

The following repeating clinical impressions may be familiar. One or both partners may raise a level of dissatisfaction with the sexual relationship several months or years post-injury. A program of psycho-sexual exercises may be initiated, but an impasse may then be reached in the work, where the couple may not be attempting the exercises between-sessions. There seems in these cases to be an unspoken dimension exerting a powerful influence on both the couple's sexual life and their reporting of such in therapy sessions. A focus solely on the mechanics and physicality of couples' sexual relationships, risks not addressing this other dimension, being ineffective as a physical sexual functioning intervention, while missing an invitation to attend to the wider status of the couple's relationship. Other studies describe a parallel process of emotional and relational disconnection between partners post-injury, alongside the sexual dysfunction. Partners disclose their feelings of "living with a monster", analogous to living with Jekyll and Hyde" (Wood, 2005). Others describe being "married to a stranger" (Wood, 2005), "married without a husband" (Mauss-Clum and Ryan, 1981), wanting their real husband back (Wood, 2005). Intimacy "feels wrong" to some partners (Gosling & Oddy, 1999), with the emotional side feeling "badly damaged" (Oddy, 2001), and some partners report a dislike of physical contact (Rosenbaum and Najenson, 1976). These accounts both describe experiences and judgments of personality change but also a breakdown in familiarity, recognition of close others and psychological intimacy between partners (Yeates et al., 2013). As such, physical and psychological distance are distressingly-intertwined.

Attachment Theory: Negative Emotional & Sexual Interpersonal Cycles

AT describes how a mammal seeks the physical proximity of a care-giver to regulate its emotional distress. Articulated first by Bowlby (1969), researchers have substantiated and validated these initial observations of innate attachment behaviours in several mammalian species (e.g., Panksepp, 1998), highlighting the profound dimension of attachment experience, emotions, motivations and interpersonal behaviours for all mammals, including humans. The behavioural and subjective characteristics of disruption to this process have been identified in both human childhood (Ainsworth et al., 1978) and adulthood (Crittenden, 1995) with corresponding links to psychopathology.

AT is hugely relevant for adult couples relationships (Clulow, 2001). In attachment terms, sex within an emotionally-committed relationship has been conceived as the inter-relationship of play and an emotionally-secure base. When feeling safe within the close proximity of a parent, small children will venture out to play and explore, knowing that they can return to safety as needed. In an adult sexual relationship, emotional safety, trust, and effective communication form the secure base for a couple to explore their sexual lives in a playful and exciting manner. Emotional security, desire, and excitement all are essential elements.

Given these inter-connected elements, it makes sense that sexual relationship breakdown will have emotional consequences, and vice-versa. A common scenario reported by couples is that one partner feels emotionally-unsupported and alone, while the other feels rejected and pushed away when they try and initiate sexual contact. A sexual advance may be more than obtaining physical gratification – it may be a reaching out for both simultaneous physical and emotional comfort. As such, non-reciprocation is often experienced as a rejection of the person as a whole. An emotionally-hurt, rejected partner may react with critical hostility and/or emotional withdrawal, thereby exacerbating the emotional disconnection. A net result is a simultaneous emotional and physical distance between partners.

Challenges to the Sexual Relationship & Attachment Responses from ABI

These negative experiences are likely to trigger for the survivor one of the core influences on sexual dysfunction – low mood, low self-confidence and self-criticism (Ponsford, 2003). In addition, direct influences on bodily sexual arousal and climaxing responses from an acquired neurological lesion have been documented, such hypothalamic damage association with the absence of embodied feelings of desire, erectile dysfunction, problems with vaginal lubrication and contraction (Ponsford, 2003). A reduction in sexual desire and response from one partner may be experienced by the other as emotional rejection ("they aren't interested in me anymore, I am unattractive, they don't love me anymore"). Gill and colleagues (2011) reported how survivors articulated the link between cognitive impairments such as attentional switching and sexual difficulties with their partner, noting how it was hard to be spontaneous with their sexual partners and be in synchrony with an evolving intimate encounter.

Yeates (2013) has highlighted how each major domain of cognition dysfunction can impact on emotional communication within a couple's relationship, with difficulties in social cognition highlighted as critical influences (with empirical support from Blonder et al., 2012). Acquired difficulties in mentalising (understanding the perspectives and intentions of others), recognising others' emotions and responding with felt compassion (see Yeates, 2013, for full review) are all likely negative influences. It may be hard for a survivor with one or more of these difficulties to notice the sexual cues of their partner and reciprocate accordingly. In addition, emotional misalignment between a couple following social cognition difficulties is likely to influence the emotional-sexual disconnection cycles mentioned above. Indeed, Panksepp (1998) has highlighted a shared neuro-anatomical basis for attachment responses and behaviour across mammalian species, and these acquired social cognition difficulties (linked to lesions in the same structures, including the cingulate, amygdala, orbito-frontal cortex, insula, and hypothalamus) likely reflect the neuropsychological consequences of damage to this substrate in human adults.

Challenges to Attachment Bonds from Pre-Injury Experiences
Alongside the conceptualisation of injury-related changes in sexual, emotional and relationship functioning, it must be born in mind that no survivor or partner is a blank slate at the point of injury, and may have been struggling with developmental, historical challenges to emotional and sexual intimacy with others irrespective of brain injury. Difficult early experiences in childhood (e.g., neglect, childhood sexual, emotional and physical abuse) and harmful previous romantic relationships may exert additional influences on a couple's relationship post-injury, often interacting with injury-related impairments. Such a case is described by Yeates and colleagues (2013), where the presence of a survivor's post-injury initiation difficulties was so emotionally-triggering for their partner. Herself an adult survivor of childhood sexual abuse, she was unable to initiate any of the new interactions required by the couples therapy intervention. Her partner's psychological inertia triggered historical feelings of neglect and exposed vulnerability for her, which left her feeling unsafe and unable to reach out to her partner and risk further emotional rejection. Unfortunately, the survivor needed external prompts and cues from his partner due to his cognitive difficulties, and so their disconnection perpetuated.

Incorporating AT into Assessment and Intervention within Psychosexual Work

An attachment perspective cautions against omitting the relational and emotional dimension of changes in the sexual relationship post-injury. Assessment questions that track and qualify changes in sexual desire and responsiveness of each partner post-injury should be interwoven with an exploration of how both partners feel in response to these difficulties. Feelings in response to the initial changes in the sexual relationship post-injury should be explored, along with tracking the micro-feelings and emotional responses elicited during each encounter.

With regards to intervention, attachment-informed couple therapy interventions following brain injury have been described by Yeates and colleagues (2013) and these would caution against commencing psychosexual work before addressing emotional disconnection between a couple. These approaches would work to highlight negative cycles of conflict and emotional disconnection and then work actively with a couple to orchestrate new interactions of communicating emotional needs and experiencing these being met (with the use of adjunctive cognitive rehabilitation strategies where necessary). A strengthened a closer emotional bond between the couple is viewed as a secure base upon which psychosexual interventions such as sensate focus can be more effectively-deployed. Indeed, couples may spontaneously reclaim aspects of their physical relationship following increased emotional closeness. When working through psychosexual interventions with a couple, any blocks to progress should always be explored through a lens attentive to the emotional experiences and patterns of criticism/withdrawal between the couple.

Conclusions

It is hoped that this brief article, informed mainly by clinical experience and opinion, substantiated by theory and differing strands of the literature on post-injury sequelae, persuasively highlights attachment as a critical but often omitted dimension to psychosexual work in neuro-rehabilitation. Difficulties in sexual functioning post-injury cannot be disentangled from the wider emotional and relationship context in which such changes manifest/evolve, and are also influenced by other co-occurring challenges to intimacy of all kinds post-injury. Both injury-related and premorbid factors can work in tandem or in combination to challenge relationships in complex ways post-injury. While this article has been focused mainly on working with couples post-injury, the aforementioned factors and processes will also create barriers to a survivor wanting to develop new relationships with others, while coping with social isolation and low self-esteem. It is suggested that assessing and formulating the emotional and relational alongside the sexual, will yield wider-encompassing and more effective forms of psychosexual support for survivors and their partners.

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Author Bio

Giles Yeates, DClinPscych, MSc (Clin Neuropsych), AFBPS, is a clinical neuropsychologist and couples therapist, working in the UK in the National Health Service and in independent practice. His clinical practice exclusively focuses on the innovation and application of novel psychological therapies for survivors of acquired brain injury and their significant others within community settings. Dr. Yeates is also an active teacher/trainer and researcher (University of Oxford and Oxford Brookes University), investigating social cognition, social relationships and emotional changes following brain injury, and the development of mind-body interventions (e.g., tai chi) in neuro-rehabilitation. Dr Yeates is the past editor of Neuro-Disability & Psychotherapy journal (Karnac) and is the current editor of the Brain Injury and Neuro-Disability & Psychotherapy: Specialist Topics series for Routledge books.

Sexual Surrogacy in Traumatic Brain Injury Rehabilitation: A Legal Perspective

Wayne J. Miller, JD

I. Introduction

Many years ago, a young client came to me with a peculiar request. The client, who I'll call "Lenny," was an 18-year-old individual with severe traumatic brain injury (TBI), three years post-injury. Lenny was left with severe physical and cognitive deficits. He had been in residential rehabilitation for a long time. In a voice quavering both with emotion and ataxia, Lenny said to me: "Wayne, can you get me a girl? You know what I mean!"

I told Lenny that of course I knew what he meant, but that I could not honor his request. Despite what people think of lawyers, I was not in the business of soliciting prostitutes for my clients. So, I was forced to disappoint Lenny. But I have never stopped thinking about our conversation. This article is dedicated to Lenny and the many other young men and women who I have had the privilege to represent, and who have had similar requests and needs that have gone unfulfilled in our TBI rehabilitation system.

TBI affects every aspect of human function. Individuals with TBI like my client Lenny are often left with significant functional and behavioral impairments. In particular, survivors are often unable to maintain normal social relationships. Old friends no longer come around. Marriages often end in divorce. New friends and intimate relationships are difficult or impossible to develop. Human sexuality is often a casualty of TBI (Simpson & Long, 2004). The result of this inability to develop friendships and maintain social and sexual intimacy: profound isolation and loneliness (Davis & Schneider, 1990).

Conventional rehabilitation programming addresses sexual issues, but largely in the form of conventional counseling. Some rehabilitation programs include activities such as pet therapy and gardening. These are laudable. Yet, for those with profound physical and/or cognitive impairments, conventional therapeutic approaches are often insufficient to actually achieve an intimate relationship. For those individuals, something more is required. The purpose of this article is to discuss expanded availability of services to directly address problems of sexual intimacy in our TBI patients. In particular, expanded availability of sexual surrogacy services is advocated. Simply put, therapy toward establishing sexual intimacy requires more than talking, working with a pet, or gardening (Aloni, Keren, & Katz, 2007; Rosenbaum, Aloni & Heruti, 2014).

II. Traditional TBI Rehabilitation Programming Does Not Address Sexual Needs in a Comprehensive Fashion

Standard components of TBI rehabilitation programs include: custodial care; physical therapy; occupational therapy; speech/language pathology; nursing oversight; and medical management. Residential TBI programs also commonly offer opportunities for socializing and community access, including outings to restaurants and movies. However, therapy addressing patient's sexual needs is often passive, reactive or missing altogether from formal rehabilitation programming (Simpson & Long, 2004).

In order to fully appreciate sexuality, the individual with TBI must participate in sexual activity. The problem is that such individuals are often unable to access their sexuality in a "normal" manner, due to the various cognitive and functional deficits that are characteristic of severe TBI (Aloni et al., 2007).

This discussion is not meant to diminish the importance of conventional therapy regarding hygiene, etiquette and other social competencies.

Rather, conventional approaches do not sufficiently address sexuality for individuals with severe TBI.

There are a host of reasons as to why sexual issues go unaddressed in TBI rehabilitation settings. These include lack of information and training concerning sexuality and institutional/professional discomfort in dealing with the issue (Davis & Schneider, 1990). "Institutional/professional discomfort" includes concerns over civil and criminal liability exposure, and concern over insurance reimbursements. These will be discussed below.

In the absence of rehabilitation programming that adequately addresses sexual needs, sympathetic friends or family may seek the services of a prostitute for their TBI survivor. Apart from the obvious legal and safety issues, prostitution is generally not conducted in a therapeutic environment, i.e., the sexual services of the prostitute are not connected to a supervised and goal oriented therapeutic regimen. For many, sexual needs simply go unmet.

Accordingly, "[i]n order to include sexuality as part of the rehabilitation process for survivors after TBI, the term rehabilitation needs to be broadened" (Aloni, 2007).

III. A Broadened Therapeutic Approach to Impaired Sexual Functioning: Sexual Surrogacy

Neither reaction, ignoring sexual needs or resorting to prostitutes unconnected to a therapeutic regimen, is optimal. As part of a broadened concept of TBI rehabilitation, let us consider sexual surrogacy therapy as an adjunct to conventional rehabilitation programming. First, what is sexual surrogacy therapy? Sexual surrogate therapy involves three actors: the therapist; the surrogate; and the patient.

Sexual contact by the surrogate is done in the context of a comprehensive therapy regimen. Critical elements of this unique therapy include:

1. Placement of sexual contact in the context of conventional therapy;
2. Conduct of sexual therapy under the supervision of a trained therapist;
3. Extensive training and screening of surrogates in the incredibly delicate, discreet and personal therapy; and
4. Screening of patients, i.e., this therapy is not for everyone (Rosenbaum et al., 2014).

Sexual surrogacy may thus be a most useful method to facilitate adjustment to severe functional impairment, and to address the profound isolation and loneliness that is a hallmark of TBI (Aloni et al., 2007).

IV. Problems in Providing Sexual Services to Patients

If sexual surrogacy services are beneficial, why aren't they in common use? There is a host of reasons: legal; ethical; religious/moral; insurance/reimbursement. Perhaps the foremost of these reasons is the legal concern that sexual surrogacy services are "prostitution." Prostitution is clearly illegal in most places. Here is the Michigan statute:

"A person 16 years of age or older who accosts, solicits, or invites another person in a public place or in or from a building or vehicle, by word, gesture, or any other means, to commit prostitution or to do any other lewd or immoral act, is guilty of a crime punishable as provided in section 451" (Michigan Compiled Laws, 750.448).

In addition to the act of prostitution, Michigan law renders illegal those who support prostitution services, i.e., in the vernacular, the "pimp" and the "bordello". These are considered felonies subject to substantial punishment (Michigan Compiled Laws, 750.457).

These penalties are obviously a stark warning against engaging in "prostitution." So we know that "prostitution" is illegal. But what then is "prostitution"? The word itself is not defined in the Michigan statute. We have to look at case law to define the term, and to thereby know what is illegal. Michigan cases apply a dictionary definition of prostitution:

"Prostitution is performing an act of sexual intercourse for hire, or offering or agreeing to perform an act of sexual intercourse or any unlawful sexual act for hire..." (People v Warren, 1995).

Advocates of sexual surrogacy attempt to distinguish surrogacy from prostitution on the basis of a variety of factors tied to the therapeutic purposes and benign intentions of surrogacy (Rosenbaum et al., 2014). However, while therapeutic surrogacy services may be done for the most noble purposes, the legal question remains as to whether the "sexual" part of sexual surrogacy services is prostitution. Put bluntly: is sexual surrogacy the provision of sex for money? There is little law on this point. The very lack of such guidance causes uncertainty as to whether one could be prosecuted. The risk of prosecution deters the development of sexual surrogacy as a viable and needed component of TBI rehabilitation (http://sexuality.about.com/od/sexualhealthqanda/a/Are-Sex-Surrogates-Legal-In-The-United-States.htm).

V. Future Directions

Once legal issues are resolved, a host of other issues will remain to be considered. These include the TBI rehabilitation facility's exposure to civil liability for failure to provide a safe workplace, and one free of sexual harassment. One can immediately appreciate this concern when one of the primary duties of the sexual surrogate employee is to provide sexual services.

A second area of concern is as to the emotional vulnerabilities and sensibilities of the sexual therapist and sexual surrogate. While many other professions require the utmost sensitivity to patient needs, few if any other professions involve the level of intimacy that is inherent in the role of surrogate. As such, one can anticipate the need for greater attention being paid to the mental health of the surrogate, with greater accommodations being made in the workplace (Rosenbaum et al., 2014).

A third area of concern is that of professional ethics. Sexual relationships between psychotherapists and patients have been characterized as the "cardinal sin of therapy" and an "extreme transgression" (Sadock, Sadock, Ruiz, & Kaplan, 2009). Yet the central tool of sexual surrogate therapy is the structured and supervised use of sexual relationships. This will require the development of a new ethics. Just as important, this will require an effective method of monitoring ethical compliance.

A fourth area of concern is the therapeutic "end game" of sexual rehabilitation. This article has advocated for a broader and more comprehensive view of TBI rehabilitation to include the use of sexual surrogates. But when and under what circumstances is therapy completed? This depends of course on the goals of therapy. The Israeli experience discussed in the Rosenbaum and Aloni articles suggest a goal oriented therapy focused on improving behaviors in part through the use of sexual therapy. But what if the goal is simply to give pleasure to someone who has no other way to achieve it? Stated another way: what are the rehabilitation goals for an individual with severe physical and cognitive impairment? Is there a realistic goal for "rehabilitation"? Can sexual surrogacy services be considered appropriate as "maintenance therapy" as is done with therapy for other forms of physical dysfunction? In such programming we look to quality of life issues as opposed to achieving improved function. Perhaps sexual surrogacy therapy may encompass both goals: a rehabilitation goal of improving function; and a maintenance goal of sustaining a reasonable quality of life. Perhaps an individual with TBI may graduate to unsupervised relationships outside of therapy, even "...like being with a 'call girl' if other forms of relationships are not available" (Aloni et al., 2007).

This leads us to our final area of discussion: that of the morality of providing sexual services in the clinical fashion described. The distinctions between sexual surrogacy and prostitution discussed above may not be persuasive to the reader. Some may object to sexual acts for pay and outside the sanctity of marriage.

My own view of the morality of sexual surrogate services to the severely disabled is that it is an act of compassion and of mercy. The rehabilitation professions exist to facilitate adjustment to the wreckage wrought by TBI. But not nearly enough is done to address the sexual needs of our TBI survivors. I would hope that this article starts a more purposeful discussion of the use of sexual surrogate therapy. When clients like Lenny come to me in the future I want to be able to offer them a legal and viable alternative to loneliness and despair. As Brian Wilson wrote:

Love and mercy that's what you need tonight
So, love and mercy to you and your friends tonight.

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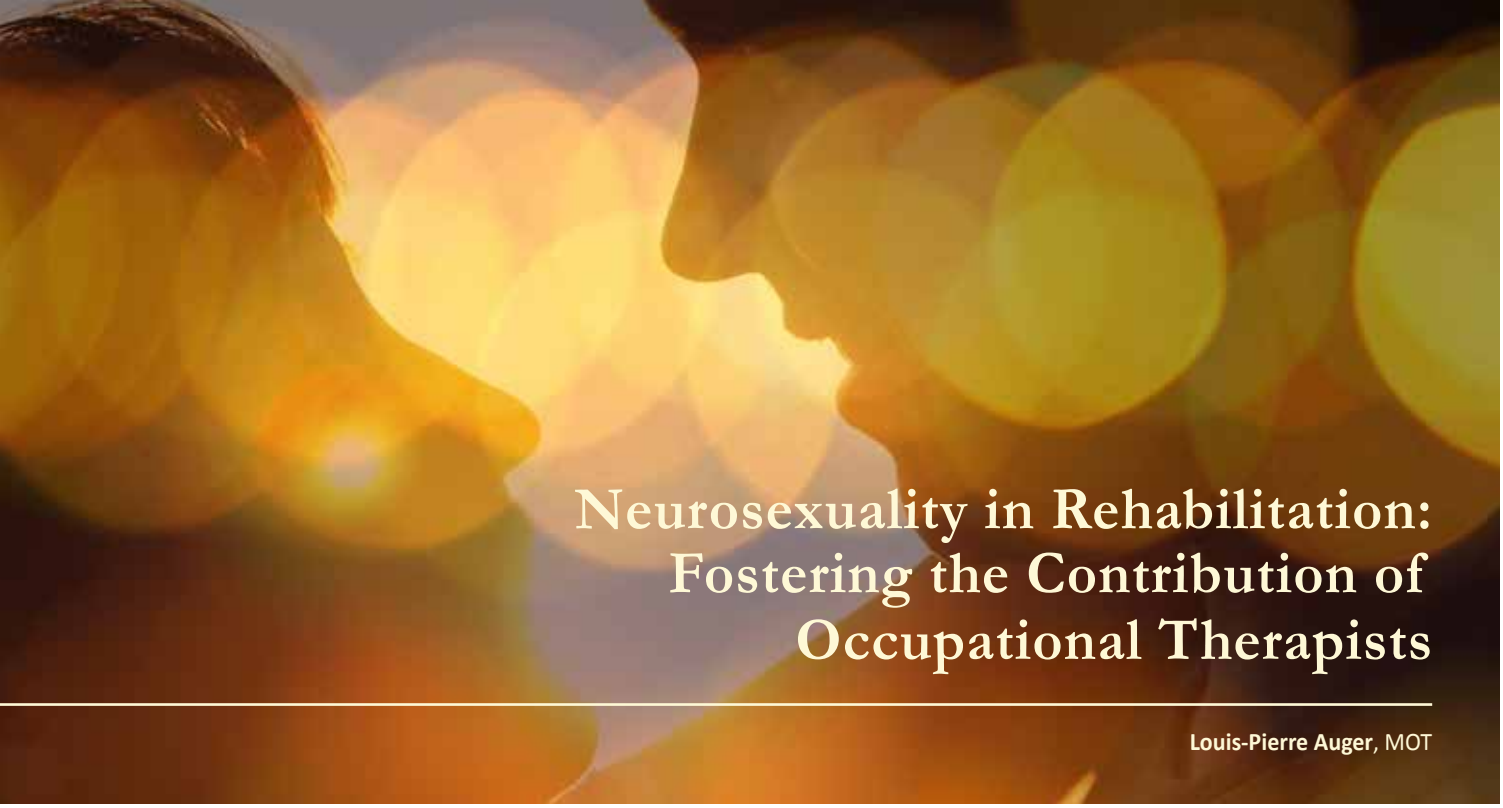
Author Bio

Wayne J. Miller has been licensed to practice law in Michigan since 1980. His practice is devoted to the legal needs of individuals with catastrophic brain and spinal injuries, their families, and their service providers. Mr. Miller has served as an Adjunct Professor of Law at Wayne State University School of Law in Detroit Michigan since 1998, where he teaches the class in Michigan's unique no-fault automobile insurance law. Mr. Miller is also the co-author of the textbook on Michigan's no-fault law: "Motor Vehicle No-Fault Law in Michigan."



Neurosexuality in Rehabilitation: Fostering the Contribution of Occupational Therapists

Louis-Pierre Auger, MOT

Acquired brain injuries (ABI) such as a stroke or a traumatic brain injury (TBI) can impair individuals' performance in significant daily activities, including sexual activities. In fact, approximately 50% of individuals with TBI (Rees et al., 2007; Sandel et al., 1996) or stroke (Korpelainen et al., 1999) experience sexual difficulties. Sexual activities are defined as ''engaging in activities that result in sexual satisfaction and/or meet relational or reproductive needs'' (AOTA, 2014). As part of activities of daily living, sexual activities are therefore within the scope of occupational therapy practice.

Canadian best practices in stroke (Hebert et al., 2016) and TBI (INESSS-ONF, 2015) rehabilitation suggest that sexuality be addressed with all individuals with ABI. Therefore, occupational therapists should include a discussion about sexuality and potential impairments with clients in their practice who have such a diagnosis. However, few occupational therapists actually raise issues related to sexuality, due to many barriers such as a low level of knowledge regarding sexuality and a lack of confidence or training (Sakellariou & Algado, 2006; Dyer & das Nair, 2013). The purpose of this paper is to outline and suggest strategies to facilitate discussions about sexuality in clinical practice, whether specifically in occupational therapy, or in other disciplines. This paper is based on a selective review of the literature on studies regarding sexuality and ABI, mainly stroke and ABI, and will also draw upon personal experiences from four years of practice as an occupational therapist in stroke rehabilitation.

Which clients could benefit from a discussion about sexuality in neurorehabilitation?

While occupational therapists in this field are encouraged to systematically initiate a discussion about sexuality with their clients, some individuals with ABI may choose not to consider the subject to integrate a specific functional objective in their treatment plan due to personal reasons (e.g. sexuality not being a priority at the time of the discussion). Offering all individuals with ABI the opportunity to address sexuality during their rehabilitation will improve the odds that those who need or want to talk about it will do so.

Where should a discussion about sexuality take place?

Confidentiality is very important when talking about sexuality, as with any sensitive topic. Therefore, these discussions should take place in a private setting, such as a closed room. Open areas such as therapy gyms are likely to be unsuitable for a frank conversation. When possible, reserving a private room for such an appointment is recommended.

When should a client with ABI be asked about sexuality?

Occupational therapists need to be informed about the client's condition and limitations in other activities of daily living before addressing sexual activities. In fact, the initial occupational assessment may reveal impairments that may also influence sexual activities. For example, an occupational therapist assessing a client's ability to wash and dress may observe signs of upper limb spasticity that affect mobility and that could impair sexual activities. In such a case, sexuality could be addressed at the end of the initial evaluation. Alternatively, for individuals in inpatient rehabilitation, the week before the first weekend at home or before official discharge may be a good time. In outpatient settings with individuals with ABI living in the community, any time after the initial evaluation has been completed may be appropriate. More importantly, sexuality should not be addressed too late in the client's follow-up, since it may become impossible to meet their needs due to other priorities or a lack of time.

Individual client preferences regarding the best moment to address sexuality in neurorehabilitation vary significantly (Stein et al., 2013), underlining the importance of adopting a person-centered focus based on the individual's needs. As such, occupational therapists should offer the opportunity to the clients to address sexuality whether they are in acute care, a rehabilitation setting, or community reintegration. If the individual with ABI is not ready for such a discussion when offered, the clinician should encourage the person to raise the topic in the future if they wish.

How should sexuality be addressed in neurorehabilitation?

Before addressing questions related to sexuality with a client, clinicians may wonder how to start the discussion. A good way to begin with individuals with ABI is to rely on therapeutic tools such as the PLISSIT model (Annon, 1976), which is described in detail in the feature article of this issue.

First of all, it is important for each clinician to feel comfortable. Some occupational therapists may prefer to start the discussion with direct questions, whereas others may prefer to offer the client an informative flyer on the topic and follow up by asking if the client has any questions; perhaps a discussion will occur after that. The use of neutral and inclusive language (e.g. partner instead of wife/husband or girlfriend/boyfriend) will introduce an open and respectful tone (Moreno et al., 2017). Clinicians must be aware that their client may be lesbian, gay, bisexual, transsexual, queer, intersex or asexual (LGBTQIA). Therefore, being informed about sexual orientation and gender identity can be useful. Moreover, using open-ended questions like "What is it like for you when -" or "What do you wish you could do" can be a good way to foster your understanding of the person's reality and encourage a positive outcome from the discussion for the client. Furthermore, using open-ended questions will give individuals with ABI the freedom to raise topics they find relevant. Occupational therapists will then be able to decide if the issues affecting the individual's sexuality are within the scope of their practice or if a referral to another professional would be appropriate. Moreover, when being questioned about sexuality, clients may mention negative or traumatic events (e.g. sexual abuse) or experience levels of psychological distress that are beyond the expertise of occupational therapy. Therefore, clinicians should be knowledgeable about psychological resources available in the clinical setting or in the community, depending on the context of the clinical practice.

As part of focusing on his/her expertise, the occupational therapist should identify appropriate specific therapeutic objectives with the client. For example, being able to masturbate independently or to attend an event where social ties may be established could be pertinent functional objectives related to sexual activities for individuals with ABI. Once the therapeutic objectives have been established, an evidence-based outcome measure such as the Canadian Occupational Performance Measure (Law et al., 1994; McColl et al., 2000) could be used to assess the client's self-perception of performance in the sexual activity before and after the rehabilitation interventions.

Intervention in Occupational Therapy Regarding Sexual Activities

The role of the occupational therapist is to encourage and enable individuals with ABI to participate in activities that are important in their daily life. According to the American Occupational Therapy Association, sexuality can be addressed by practitioners from a perspective of health promotion, remediation and/or modification (AOTA, 2018). Health promotion can involve educating the client about aspects of sexuality and the impact of the ABI, as well as teaching healthy life habits that could positively influence the client's sex life. Remediation refers to working with the client so they can recover certain abilities such as balance, strength, range of motion and sensation. Sometimes, modification of the environment where the sexual activity may occur, or considering ways of modifying the designated sexual activity for it to better correspond to the client's abilities, can also be included in intervention strategies.

Although the occupational therapist can play a key role in neurosexuality, collaborating with other professionals and sharing expertise – a transdisciplinary approach – will significantly foster chances of success for the client (Moreno et al., 2017). This collaboration in the treatment of sexual concerns was illustrated in the biopsychosocial model of intervention and is presented in FIGURE 1 (Moreno et al., 2013).

Clinicians should evaluate which approaches they feel able to implement and seek guidance from other professionals when appropriate. As occupational therapists, we have a role to play in enabling our clients to engage in sexual activities that are significant for them, like modifying the task or the environment in which the sexual activity takes place. After all, our objective is to offer comprehensive rehabilitation services to our clients and optimize their quality of life.

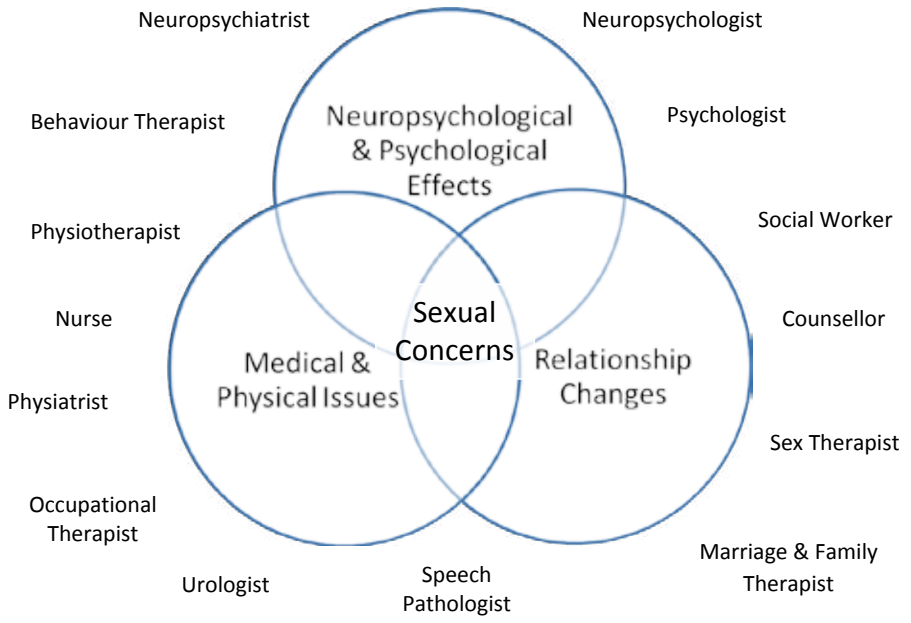


FIGURE 1. Biopsychosocial Model of Intervention, Gan 2005. Reprinted from *NeuroRehabilitation*, 32(1), Moreno, A., Arango-Lasprilla, J., Gan, C., & McKerral, M. Sexuality after traumatic brain injury: a critical review, 69-85, Copyright (2013), with permission from IOS Press.

For example, an individual who has had a stroke and is experiencing hemiparesis with shoulder pain and who wishes to have intercourse in his bed could benefit from collaboration between all members of an interdisciplinary rehabilitation team. The occupational therapist could suggest cushions and positioning techniques to better support the hemiparetic side during sexual activities and train the client to adopt certain positions.

The physical therapist could also train the client in using the positioning techniques and treat the shoulder pain with exercises and other specific treatments. Finally, the doctor could prescribe an antalgic medication with specific advice related to care of the shoulder.

In conclusion, this article addressed different aspects and strategies for occupational therapists and other professionals to consider in preparing for a discussion about sexuality with a client in neurorehabilitation.

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Author Bio

Louis-Pierre Auger, MOT, is a licensed occupational therapist who has been working for more than four years in stroke rehabilitation at the Rehabilitation Hospital Villa Medica in Montreal, Quebec, Canada. He is currently pursuing a masters degree in Rehabilitation Sciences in the School of rehabilitation at Université de Montréal and his research is focused on improving the implementation of sexuality in rehabilitation settings, mainly in stroke rehabilitation.

BIP expert interview

Grahame Simpson, PhD

with Dr. Grahame Simpson, PhD

Professor Grahame Simpson leads the Brain Injury Rehabilitation Research Group at the Ingham Institute for Applied Medical Research in Liverpool Sydney. His clinical position is Social Worker-Clinical Specialist at the Liverpool Brain Injury Rehabilitation Unit, Liverpool Hospital. Dr Simpson has a dual professional background as an accredited social worker and registered psychologist (counselling psychology). Dr Simpson has worked the past 30 years as a clinician researcher addressing psychosocial adjustment to acquired brain injury including positive sexual adjustment. He authored the You and Me Sex Education Program and collaborates with a Sydney-based sexual health physician and sexual health counsellor to treat the sexual changes experienced after brain injury. Dr Simpson is Co-Editor of Brain Impairment, member of two editorial boards (Journal of Head Trauma Rehabilitation, Australian Social Work) and founding co-convenor of the International Network of Social Work in ABI.

1. Why is sexuality important in neurorehabilitation?

Sexuality is a core component of our humanity. The World Health Organisation states that sexual health is a state of physical, emotional, mental and social well-being. Being able to enjoy this type of sexual health is a human rights issue for people with disability including acquired brain injury.

The mission of rehabilitation is to restore patients to the highest level of physical, psychological and social adaptation attainable" (World Health Organisation, 1996, p. 1). Despite this, very few people with brain injury report that the issue of their sexual wellbeing was addressed during their rehabilitation episode. Most people want to engage or re-engage with the sexual dimension of their lives post-injury. A recent study found that 82% of a sample of people with brain injury in the United States had been sexually active in the first year post-injury (Sander et al., 2012).

However, a growing number of studies have found that significant numbers of people face challenges to their sexual wellbeing as the result of their injury. Clinically, we know that our clients potentially face a broad range of issues. This can be around problems of sexual functioning; adaptation of sexual activity to compensate for physical or cognitive disabilities; adjustment in the context of a pre-existing relationship; fertility and contraception issues; as well as safer sex, just to name a few. Meeting such challenges can be even more daunting for people from LGBTQIA+ backgrounds in heteronormative rehabilitation service environments.

Many of the problems people face after a brain injury are treatable but only if we identify them.

2. How can rehabilitation professionals facilitate a discussion about sexuality with their clients?

First by staying calm. This means maintaining an open body posture and speaking with an even tone of voice. Staff members can use a **V**ery **N**ormal **R**esponse to respond well to a client raising an issue of sexuality. **V** stands for validating the client (e.g., I can tell this is a concern for you, and it is important that you have been able to speak up about it). **N** stands for normalizing the concern (e.g., It is common for people to have sexual health concerns after an injury). **R** stands for referral (e.g., I may not be able to help you with your concern, but I can find someone who can). This is the basic competence that all neurorehabilitation staff should be trained in, providing clients and/or their families with the "Permission" to raise sexual health concerns.

Staff who have more training or experience can engage with their clients at the levels of "Limited Information" or "Specific Suggestions", linking people into information resources or providing specific suggestions to address client concerns.

"Intensive Therapy" is best delivered by staff who have had graduate training or equivalent experience in sexual health counseling or sexual health medicine.

Many of your readers will recognize that the four steps I have outlined reflect an application of the PLISSIT model, a stepped framework for addressing sexual health issues used widely across the health and human services sectors, to the field of neurorehabilitation. It is a useful model because staff can be trained to facilitate discussions commensurate with the level of their knowledge and skill.

Which staff might take the lead in these conversations? Sexuality is an interdisciplinary field. It will, therefore, depend on the nature of the clients' sexual health concern - various staff can have a role to play including physicians, nursing, occupational therapy, physiotherapy, speech and language therapy, social work, psychology as well as attendant carers and other support workers.

The other challenge implicit in your question is moving from a reactive stance to a proactive stance. A reactive stance means that the topic of sexuality is only addressed if a client or their family raises the issue. Research over the past 3 decades suggests that this is the most common practice within neurorehabilitation. A proactive stance would mean that staff in neurorehabilitation services takes more initiative in checking with clients whether they have any sexual health concerns.

3. To date, your program "You and Me" has been the only intervention showing evidence of success to address sexuality concerns in individuals with traumatic brain injury (TBI). Why do you think there is a paucity of interventions in sexuality post-TBI and what be done to encourage more evidence-based interventions in this area?

Yes, it would be ideal if there were more choices both for clients and for staff, in terms of programs that target the promotion of positive sexual adjustment post-injury.

The absence of research into interventions is puzzling, as it is not universal across all neurological groups. For example, randomized controlled trials evaluating treatments for erectile dysfunction have been conducted in a number of neurologic groups including spinal cord injury, cerebral palsy, multiple sclerosis, and Parkinson's disease. There has also been a trial evaluating a sex education program for stroke.

There is a need for champions who want to build a culture of clinical practice and research around addressing the sexual health concerns of people with brain injury. Centres which are able to run sustained programs of research, drawing upon international collaborations, are likely to be able to act as a focal point to encourage such developments.

Partnering with local sexual health services is also an invaluable resource, as it enables the integration of expertise around sexual health and brain injury.

In the absence of substantive evidence, Griffith and Lemberg, in their ground-breaking book written in 1993, recommended that existing frontline interventions for the treatment of sexual health concerns for the general population be employed, and this principle still applies today.

4. Why is research on the sexuality of adolescents and young adults with brain injury so scarce when compared with the same research in adults? What could be done to foster this much-needed research?

I want to be cautious here, as I have not worked in the field of paediatric brain injury, so it is more for others to speak about this. However, I was involved in a recent review of the ABI paediatric sexuality literature, covering children and adolescents up to 18 years of age. We found that the majority of the 28 papers identified in the review comprised case studies of precocious puberty, a rare medical complication of paediatric TBI.

As an outsider, it seems hard to understand that although sexuality is a key developmental task in adolescence, there is virtually nothing in the research literature about the experiences and challenges faced by teenagers with an acquired brain injury in negotiating this fundamental life transition through puberty and in developing a sexual identity.

There seems to be an absence of information in the research literature about a series of questions: are teenagers with ABI getting access to sex education? If so, is it pitched at a level they can process? Can they benefit from mainstream school programs? Are there additional needs not covered by mainstream programs that should be targeted? If so, how can these needs be addressed? And how can parents and schools be supported in their efforts to help children navigate their sexual development?

It could be an exciting area to research as so little work seems to have been done to date.

5. Do you think emerging technologies will play a role in neurosexuality? What are the challenges that we should anticipate?

It is hard to predict the roles emerging technologies will play, however, there are many potential opportunities. Social media provide many more outlets for people with brain injury to connect with others, and this may provide a pathway to dating and building romantic relationships. We are starting to see some research undertaken in this area but it is still very new. YouTube has clips on a wide range of sexual health issues and this may be useful for staff seeking to engage with clients and/or their families around sexual health concerns. Smartphone prompts may help to remind people about contraception and help with other cognitive barriers that interfere with their sexual lives.

People may be able to purchase physically adapted aids from specialty suppliers more easily over the internet. Internet searches may also help identify health professionals able to assist with sexual health concerns. Furthermore, communication aids continue to become more accessible and can help people who have limited vocal ability to better express themselves. In addition, smart home devices (e.g., light controls, door locks) may enable people to have greater security and privacy in meeting their sexual needs.

However, technology also brings some challenges. The easy access to pornography can include content focused on children or sexual violence, with the possibility of people then getting caught up with the law. Clients with brain injury may be more vulnerable to scammers that they meet through social media sites who capitalize on their feelings of loneliness. Staff can also find it challenging to try to keep up with the latest technology developments, and so not fully appreciate both the opportunities and the risks for their clients. Despite these risks, technology has great potential to improve the sexual lives of people with brain injury.

6. What is the future of neurosexuality?

The future is promising. There is a lot of goodwill among rehabilitation professionals in wanting to more effectively promote sexual wellbeing after neurodisability, but this needs to be translated into action. In bridging the gap between sexuality taught as part of university curricula and actual practice in neurorehabilitation services, staff training could be a key. We can then provide opportunities for clients and their families to access help as a normal part of their neurorehabilitation experience.

The groundswell of good quality descriptive studies documenting the sexual health challenges over the past decade also provides a strong foundation for future education and treatment trials. There has been a growing focus on women's issues in relation to sexuality after a brain injury. This helps to better balance the predominant focus on male sexuality that has characterized the field to date. It will help neurorehabilitation services to better target the specific needs that women with brain injury face.

The first article systematically addressing the challenges addressed by people with LGBTQIA+ orientations who sustain an ABI has been published. This is an important development, as this has been an area of neurorehabilitation in which little work has been done and will hopefully act as a springboard for future work.

Finally, a closer collaboration with sexual health services and the field of sexology will strengthen future research efforts and also help improve practice in delivery services and support to people with brain injury. Together, it will be possible to facilitate the positive sexual adjustment of all clients with a brain injury.

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About the Interviewer

Alexander Moreno, PhD, is a licensed Clinical Neuropsychologist/Psychologist member of the College of Psychologists of Quebec (Ordre des Psychologues du Québec, OPQ) in Canada and the College of Psychologists of Colombia (Colegio Colombiano de Psicólogos, COLPSIC). Currently, Dr. Moreno is an adjunct professor in the Department of Psychology at Université de Montréal and works as a Clinical Neuropsychologist/Psychologist at Notre-Dame Hospital in Montreal (CIUSSS du Centre-Sud-de-l'Île-de-Montréal). For several years, he has been working in the areas of sexuality and neurodisability. He has authored numerous peer-reviewed scientific and review articles in the areas of health psychology, neuropsychology, sexuality, and neurorehabilitation. Dr. Moreno leads a new area of research and practice known as neurosexuality, based on a transdisciplinary approach to sexuality in neurorehabilitation. As a researcher and clinician, he advocates for the inclusion of sexual rehabilitation in individuals with brain injuries and their families.

events

2019

September

19 - 20: *International Conference on Autism and Neurological Disorders*, September 19 - 20, Brussels Belgium. For more information, visit autism.geneticconferences.com.

23 - 24: *32nd International Conference on Brain Science and Cognitive Research,* September 23 - 24, Hong Kong. For more information, visit brainscience.neurologyconference.com.

23 - 26: *State of States Head Injury Conference,* September 23 - 26, Kansas City, Missouri. For more information on the conference, visit www.nashia.org/SOS2019.asp.

November

13 - 16: *39th Annual Conference of National Academy of Neuropsychology*, November 13 - 16, San Diego, California. For more information, please visit www.nanonline.org.

2020

February

26- 29: *ABI 2020: Best Practices in Brain Injury Medicine and Neurorehabilitation: Improving Outcomes Through Interdisciplinary Collaboration*, February 26 - 29, 2020, New Orleans, Louisiana. For more information on the official NABIS Conference, visit abi2020.org.

March

6 - 7: *29th Euro Neuro Congress on Neurologists and Neuroscience Education,* March 6 - 7, Rome, Italy. For more information, visit www.omicsonline.org/conferences-list/traumatic-brain-injury.

October

14 - 17: *40th Annual Conference of National Academy of Neuropsychology*, Oct 14 - 17, Chicago, Illinois. For more information, visit www.nanonline.org.

PHOTO BY HERMAN PRIVETTE

SCARLETT LAW GROUP

Scarlett Law Group is a premier California personal injury law firm that in two decades has become one of the state's go-to practices for large-scale personal injury and wrongful death cases, particularly those involving traumatic brain injuries.

With his experienced team of attorneys and support staff, founder Randall Scarlett has built a highly selective plaintiffs' firm that is dedicated to improving the quality of life of its injured clients. "I live to assist people who have sustained traumatic brain injury or other catastrophic harms," Scarlett says. "There is simply no greater calling than being able to work in a field where you can help people obtain the treatment they so desperately need."

To that end, Scarlett and his firm strive to achieve maximum recovery for their clients, while also providing them with the best medical experts available. "As a firm, we ensure that our clients receive both the litigation support they need and the cutting-edge medical treatments that can help them regain independence," Scarlett notes.

Scarlett's record-setting verdicts for clients with traumatic brain injuries include $10.6 million for a 31-year-old man, $49 million for a 23-year-old man, $26 million for a 7-year-old, and $22.8 million for a 52-year-old woman. In addition, his firm regularly obtains eight-figure verdicts for clients who have endured spinal cord injuries, automobile accidents, big rig trucking accidents, birth injuries, and wrongful death.

Most recently, Scarlett secured an $18.6 million consolidated case jury verdict in February 2014 on behalf of the family of a woman who died as a result of the negligence of a trucking company and the dangerous condition of a roadway in Monterey, Calif. The jury awarded $9.4 million to Scarlett's clients, which ranks as one of the highest wrongful death verdicts rendered in recent years in the Monterey County Superior Court.

"Having successfully tried and resolved cases for decades, we're prepared and willing to take cases to trial when offers of settlement are inadequate, and I think that's ultimately what sets us apart from many other personal injury law firms," observes Scarlett, who is a Diplomate of the American Board of Professional Liability Attorneys.

In 2015, Mr. Scarlett obtained a $13 million jury verdict for the family of a one year old baby who suffered permanent injuries when a North Carolina Hospital failed to diagnose and properly treat bacterial meningitis that left the child with severe neurological damage. Then, just a month later, Scarlett secured an $11 million settlement for a 28-year-old Iraq War veteran who was struck by a vehicle in a crosswalk, rendering her brain damaged.

536 Pacific Avenue | San Francisco, CA 94133
PHONE 415.352.6264 | FAX 415.352.6265

www.scarlettlawgroup.com