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Chair

The Honourable Peter Kent

Standing Committee on National Defence

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● (0850)

[*English*]

The Chair (Hon. Peter Kent (Thornhill, CPC)): Colleagues, we have quorum. Today we will continue our study of the care of ill and injured Canadian Armed Forces members.

We have two groups with us today. Appearing as an individual we have Dr. Anne Germain, associate professor of psychiatry, from the University of Pittsburgh School of Medicine.

From the Ottawa Hospital Rehabilitation Centre we have Helen Zipes, clinical director of the rehabilitation centre and academic family health team, and Sean Gehring, the manager of the specialized care stream.

We will begin as usual with 10-minute presentations from each group.

Dr. Germain, could you take the table, please, and give us your 10-minute presentation. Thank you for travelling to be with us today.

Dr. Anne Germain (Associate Professor of Psychiatry, University of Pittsburgh School of Medicine, As an Individual): Thank you for inviting me. It's really an honour to be here today.

As you said, I am Anne Germain. I'm an associate professor in psychiatry and psychology at the University of Pittsburgh School of Medicine. I graduated in 2001 from the University of Montreal with a Ph.D. in clinical psychology and moved to Pittsburgh for a post-doctoral fellowship, where I joined the faculty in 2005.

Since then my research program there has focused on understanding how sleep disruption can compromise mental health and mental readiness in military populations, active duty service members and veterans, as well as on developing and testing sleep-focused treatments as a pathway to enhance psychological resilience and accelerate recovery from chronic maladaptive stress reactions in service members.

My research program has been continuously funded by the U.S. Department of Defense and the National Institutes of Health.

I want to take the opportunity today to demonstrate that sleep is a core component of mental health and mental readiness, especially for the armed forces.

Sleep is a fundamental brain function and biological process that is involved in sustaining mental and physical performance.

We all sleep, and we've all occasionally experienced the adverse effects of sleep disruption, but unless we have chronic sleep disturbances, we spend very little time thinking about sleep and its function, especially in a military context.

In 1981, Major-General Aubrey Newman wrote the following in his book:

> In peace and war, the lack of sleep works like termites in a house: Below the surface, gnawing quietly and unseen to produce gradual weakening, which can lead to sudden and unexpected collapse.

This citation is a great illustration of how sleep disruption is really a threat to mental readiness and operational performance in military settings.

Sleep is essential for survival, and it's involved in different biological and mental functions, including emotion regulation, decision-making, learning and memory, as well as cardiovascular and immune functions.

Sleep can and will temporarily adapt to unusual and extreme demands and circumstances. However, we need to think about it as malnutrition. Chronic sleep deficiency will lead to organ damage and failure.

In the case of sleep, the primary organ is the brain. Failure and chronic damage means compromised mental health and readiness in our armed forces.

Sleep disturbances are the most common problems reported during and after military deployment. We have many studies now that show the likelihood of poor sleep quality and short sleep duration dramatically increases during deployment in service members. We also have quite a bit of evidence that post-deployment the sleep problems that occur during deployments do not return to pre-deployment levels. In other words, sleep does not just return to normal after people come home from different deployments.

That's true even when operational demands and stressors are terminated. In fact, in the U.S. among active duty service members and veterans we know that anywhere between 40% and 90% of those who have served in different theatres since 2001 report clinically significant sleep problems, including insomnia. It's true even in those who don't meet full-blown criteria for post-traumatic stress: depression, anxiety disorders, or mild traumatic brain injury, for example.

It's also important to remember that sleep problems are also prevalent in those who have not deployed. Luxton and colleagues recently showed that over 70% of non-deployed service members have a very short sleep duration, less than six hours a night, chronically. That number is about 30% in the general civilian population.

When we put that together, what we can realize is that our service members continuously operate and fulfill missions under conditions of marked sleep restriction, if not full-blown sleep disorders. This may very well be unavoidable during different military operations; however, it should and needs to be addressed when people come home so that the service members can return to their optimal levels of readiness and veterans can be best prepared to return to a healthy civilian life.

There's a very tight and robust relationship between sleep disturbances and poor psychiatric outcomes following exposure to stress or trauma exposure.

We know that sleep disturbances that precede or occur shortly after exposure to stress or traumatic events are a very strong predictor of poor psychiatric outcomes, and those include post-traumatic stress disorder, depression, heightened suicidality and other anxiety disorders, alcohol abuse and other addictive disorders, as well as the cognitive problems that are oftentimes associated with mild traumatic brain injury. The same observations, however, suggest that the preservation of sleep during stressful conditions or the rapid restoration of consolidated sleep after stress exposure is a pathway not only to enhance psychological resilience but also to accelerate recovery from expected stress reactions.

Although sleep disturbances are prevalent in service members and they are associated with an increased risk with poor psychiatric outcomes, they are a treatable condition. In other words, they are a modifiable threat to mental readiness and psychological resilience in military service members. We, as well as others, have shown that evidence-based treatment not only improves sleep quality in service members and veterans but also that sleep improvements are consistently associated with improvements in daytime symptoms of post-traumatic stress, depression, anxiety, and even cognitive functioning in those with mild traumatic brain injury.

There are two types of stress strategies for the treatment of sleep disturbances. The more behavioural treatments involve initiating and maintaining different sleep-promoting habits and behaviours. Those have shown to be highly effective in improving sleep and daytime consequences of sleep disturbances or of co-morbid psychiatric disorders. Pharmacological treatments can also be helpful, and when sleep is improved, we consistently see improvements in daytime functioning.

Even though we have effective sleep treatments that are evidence based, there is still a lot of work to be done to test their true effectiveness in military health care settings and in military populations. For example, the behavioural treatment of insomnia typically requires six to eight weeks of individual therapy delivered by a specialist in behavioural sleep medicine. This is typically not widely available, and it's not practical for most military health care settings, or in most military populations, for that matter.

By the way, engaging service members for two months of therapy is not a small challenge either.

Effective treatments that we have must be re-evaluated and adapted for the reality of military health care settings and the kinds of challenges that are faced by our service members. For example, we have shown that we can effectively treat insomnia within four weeks of using evidence-based educational material and personalized treatments that are delivered over a single 45-minute session and a two-week follow-up by phone. In this pilot trial we have seen full insomnia remission within four weeks in over 50% of people who received the intervention.

We've also worked to develop intervention packages that can be deployed and used in theatre. You may have seen an example of the war fighter sleep kit. It's a little box that contains information about sleep, an eye mask, and earplugs. It's not perfect. It's a prototype. There's still a lot of work that can be done to improve the impact, but this just shows that this kind of effort is feasible. We have deployed over 5,000 of these to service members deploying previously to Iraq and now to Afghanistan.

The last argument I want to offer in support of the notion that sleep is a core component of mental health and mental readiness is that sleep is a non-stigmatizing entry into mental health care. Everybody's sleep is disrupted during military training and military operations. Sleep disturbances are the norm rather than the exception during military service. Everybody easily acknowledges having sleep problems which do not bear the stigma of mental illness, so if we promote sleep health, we can actually provide an acceptable entry into mental health care where other psychiatric problems can be identified and adequately treated.

In summary, what I wanted to convey to you today is, first, that sleep is a core component of mental health and mental readiness in military samples; second, sleep disturbances are a threat to mental health but they are a modifiable threat. We can treat sleep disturbances with evidence-based treatments and therefore modify the risk that is associated with poor sleep in terms of psychiatric outcomes.

● (0855)

It's true there is still a lot of work to be done before we can effectively package and disseminate the evidence-based sleep treatments that we have, but I strongly believe that targeting sleep health can have a significant and rapid impact on the life of our service members and veterans.

In conclusion, I would like to recommend that the committee recognize that sleep is a core component of mental and physical readiness and mental health, and that efforts aimed at understanding, evaluating, detecting, and treating sleep disturbances should be encouraged and supported.

Thank you very much.

The Chair: Thank you, Dr. Germain.

If you would, please stay at the table as we invite Ms. Zipes and Mr. Gehring to make their presentation.

Those who are sitting too close to the screen, like us at this end of the table, will move back in the room for the deck presentation.

Thank you.

● (0900)

Ms. Helen Zipes (Clinical Director, Rehabilitation Centre and Academic Family Health Team, Ottawa Hospital Rehabilitation Centre): Good morning, everyone. Thank you very much for inviting us.

My name is Helen Zipes. I'm the clinical director of the Ottawa Hospital Rehabilitation Centre. With me today is my colleague, Sean Gehring, who is the manager of the specialized care stream.

Today I'm going to talk a little bit about the rehab virtual reality lab. I'll talk to you a little bit about some of the clinical results from the lab and a little bit about some of the research and innovative things we're doing here in Ottawa. I will end with a patient experience from one of the members of the Canadian Forces.

This piece of equipment, the CAREN, or computer assisted rehabilitation environment, was purchased for us by DND and was installed at the Ottawa Hospital Rehabilitation Centre. I'm very proud that we were the first in Canada to have this piece of equipment. DND purchased a second unit for Glenrose. Glenrose is the rehab hospital that tends to serve the military population in western Canada; we serve everything central and to the east.

This extended system is only found in four countries: the Netherlands from where it comes, the United States, Canada, and Israel.

We really have a wonderful working relationship with our military partners.

First of all, may I ask whether anyone knows where the rehabilitation centre is?

Most people don't know that we have this jewel here in Ottawa. It is in its own building, a two-storey building behind the General campus. We treat patients there who have had some sort of major illness or accident; something has happened to people to interfere with their functions, something very serious: either they have had a spinal cord accident, an amputation, or a brain injury. They come to us for rehabilitation.

We have an in-patient program. Usually we see about 400 in-patients a year. We also have a huge outpatient program. We see more than 60,000 outpatient visits a year.

Patients come to us to improve their function. Our aim in rehab is to get people back to the community, back home, if possible.

The wonderful thing about this lab is that it helps us speed up rehab. I'm going to show you a demonstration, but it puts people in a very realistic situation. As an example, take our amputee program. In the past, the physiotherapists and occupational therapists would work with the patients in the gym. We would go outside and work on uneven ground, but we waited a long time before we would take them outside, because we have to make sure that someone is not going to fall.

With this piece of equipment, we can progress the treatment much faster. It's a very safe way. There's a harness. We can work on different goals, be it balance, gait, cognition. We use it for a wide range of patients. Virtually all outpatients can qualify for the CAREN system.

We immerse the patient in this environment, and we're able to alter the screen and the program depending on what the goals of treatment are.

As you can see in the photo on the slide, there is a series of 12 motion cameras that circle the area. There is a platform in the centre that moves in six degrees of freedom, plus can also yaw. There are two treadmills, a dual-pace treadmill, in the centre of the platform. There is a sling system; we put the patient in a harness so that they can't fall and don't walk off the platform. There is a 180° screen that surrounds. It's like a giant Wii machine, but it's so much more immersive. We've added a few extra cameras as well on the bars on either side. You really get the sensation, when you're centred on the treadmill, that you're immersed in the environment.

The lab began operations in March 2011.

In the next slide is a breakdown of some of the conditions that we've treated.

● (0905)

I'm going to go to the next slide. I think this will be more interesting for you.

Of the patients we have had since 2008, we have had approximately 25 Canadian Forces patients at the Ottawa Hospital Rehabilitation Centre. We've also had two civilians who were injured in Afghanistan. We've had about 12 CF patients and have done about 61 patient sessions using this equipment. They have orthopaedic injuries, most of our patients with amputations, and then some other diagnosis.

CRPS is chronic regional pain syndrome; ABI is acquired brain injury; and we have also had a mild traumatic brain injury.

We've also used the CAREN system as an assessment tool. We assessed a group of 10 Canadian Forces soldiers who were participating in the Nijmegen march. We were able to put them on this treadmill. The Nijmegen march is really an endurance test. I don't remember the mileage they march, but I think it's 60 kilometres —it's huge—and it's four days in a row. These were all injured soldiers who wanted to make sure that they could participate in the march, so we put them through tests on this unit.

An interesting thing that the operator of this unit did—our operator is an aeronautical engineer and a kinesiologist, so she's ideally placed to work this unit—was to alter the program a little bit. She had the crowd throwing flowers at the soldiers in the unit, because apparently that's what happens in real life. I understand that some of the soldiers find it quite shocking to have things thrown at them; many of our soldiers have PTSD. This was a way of preparing them, to see how they would react if things were thrown at them. That was a really interesting application. This isn't just a Wii machine; it is really a therapeutic tool.

The really wonderful thing about this unit—which was very expensive, a little over $1 million—is, as I said before, that it's very safe. We can try things on this unit that would be very difficult to try in a gym or outside. It's a controlled environment. We can control the pitch of the platform and the speed; we can control the environment; we can add tasks to the environment.

There is one program in which people are walking down a road, and the road goes up and down. We have birds flying. We can add math problems, because as you walk you have to be able to look at things and recognize things. We can make the program harder or easier, depending on the needs of the patient.

We can really push the patient in this unit, and it really improves their confidence. We had a young woman who had lost a lower leg in Afghanistan. She was very tiny. She did very well with her prosthetic device, but she was quite frightened. She said she wasn't sure that she could keep standing, if she took the bus and got jostled about. We put her in this unit and we were able to simulate a stumble by moving the treadmill at different speeds. She did very well and she realized that she could go on the bus. It's been wonderful that way.

It really has shortened the rehab time. We want to rehabilitate patients as fast as possible and get them back to the community. This unit is helping us do that.

As I said, we work on specific goals, be it weight-shifting, on feet or balance.... I have included “fun” on the clinical results slide. It is fun. Walking back and forth in a gym on parallel bars is not fun, and people don't stay at it that long. When you get them into an environment like this, especially our military members, who are athletes, very well-conditioned men and women, you have to push them a little bit more. This unit has been wonderful for that.

The unit is also for research. Some of the studies we have started and that we have planned on are ambulation and walking, psychology, post-traumatic stress, driving, and using a wheelchair.

● (0910)

In the next slide, these are things that some of our scientists, our engineer operator, and the team—when I say the team, this is really a team—the patients, the operator, the physiotherapist, the OT.... We haven't yet used it for speech therapy, but I understand there are some applications, and that's something we may consider. This really is a team.

These are things that have come from the patients who have told us, “We need help. What do we do if we trip? What do we do if we slip?” These are some of the projects that we're in the midst of right now. At the centre we have both upper and lower limb amputees... treadmill, slope adjustment, navigation.

I'd like to tell you about one of the gentlemen, a sergeant, who has used our unit. He unfortunately stepped on an IED in Afghanistan and lost his leg above the knee. He also had severe trauma to his arm. There was some worry at one point that he was going to lose his arm, but we've managed to save his arm. He doesn't have an elbow joint. His elbow is quite flail, but he's quite functional. He was admitted to the centre in April 2011. Originally when we asked him what his goals were, he said,“I want to be able to walk on the grass with my prosthetic.” His grandfather owns a farm and he wanted to be able to walk on the grass.

He had some further complications from his arm, as a matter of fact, and he had to have further surgery to debride the wound. Then he came back to us in May, and his initial cast for his prosthetic limb was made in June, and two weeks later he took his first steps with his prosthetic limb. On June 20, he had his first CAREN session.

This is a photo of the sergeant, and you can see it's his left leg, so he's missing his knee and his ankle. He has an above-knee prosthetic.

This is a program that was developed. It's like a maze. There are force plates under the treadmills, and there are markers put on the patient so that we can get objective data as well from this unit. This program, the maze, helps him with weight shifting, weight bearing, balance, and he has to be able to navigate the maze.

This is an example of one of our programs. It's a boat. You can see how he's moving back and forth. You see him in his harness so he can't fall. He has to navigate weight shift. There's a lot of muscles that come into play when you're with static stability, weight shifting. The waves are an added obstacle.

I'm going to go on to the next slide now. Here we have him walking down a slope, which is very difficult to do with a prosthetic limb. Don't forget, he doesn't have his knee or his ankle. I don't know if you can see, but in here it's quite a steep angle, and with this program we can either self-pace it or the operator can set the parameters for the unit, but we get objective data and we're able to progress the patient.

Again, I thank you very much for this opportunity. Our partnership with DND has been a wonderful one. This unit is available for our military patients, but also for our civilian patients, and we do use it very heavily. It has been a wonderful addition to our centre.

The Chair: Thank you very much.

We'll proceed now with our first round of questioning, seven minutes for question and answers, beginning with Mr. Opitz.

● (0915)

Mr. Ted Opitz (Etobicoke Centre, CPC): Thank you, Mr. Chair.

Thank you all for appearing today. Both presentations were quite enlightening. I understand the use of this machine is brilliant. Because most of these guys use video games and all kinds of things, they're adept at that. We actually used a video for a shooting-package program that we have.

We do all of that, and that's why they're so adaptable to this. In fact, I had a friend who joined the Canadian Forces with a prosthetic leg, way back in the day. He's just about to retire soon, so he's been around. He walks on grass just fine. In fact, he did his sergeant's training with a prosthetic leg.

You were saying this costs about a million dollars?

Would an occupational therapist be able to use this?

Ms. Helen Zipes: Yes. We've trained our physiotherapists and our occupational therapists. As I said, we're hoping that some of our speech therapists.... I understand there are some programs where you get instant feedback on how your mouth is moving and working.

Mr. Ted Opitz: I'll leave that. Mr. Norlock is interested in technology, and I think he's going to talk to you about that.

I am interested in the brain injuries. Dr. Germain, have you worked with DRDC, Dr. Harvey Moldofsky?

Dr. Anne Germain: No.

Mr. Ted Opitz: He's done some very similar research. They're working on brain injuries and sleep as well.

Having formerly served, I'll tell you that you don't get a lot of sleep on exercises or other things. Your sleep patterns are disrupted. Having observed veterans not only of my generation, but older ones, my parents and people like that, I know these things tend to be lifelong if they're not treated. I applaud the research you're doing.

Is this something you could also develop for pre-treatment, before soldiers deploy, to try to identify people who may be susceptible to sleep disorders, brain disorders, PTSD, and start treating that ahead of time? You have the war fighter kit, which is something I suspect you'd use while you're deployed. It has earphones and calming music, or...?

Dr. Anne Germain: There are different elements. On the CD there are actually different tracks of white noise to help people sleep or relax in a different environments. There's a self-administered treatment that is also included on this that guides people step-by-step on how to get rid of bad dreams or how to facilitate sleep onset, for example. It's basically material that we use in the clinic that we made more interactive and streamlined even further, so that people could use it.

Yes, we can detect sleep disturbances or vulnerability to sleep disturbances before people deploy. Because sleep is a modifiable behaviour, we can also train people ahead of time to get more consolidated sleep or get more bang for their buck, basically, so that when they can sleep, when the opportunity presents itself, they can get the most out of it, get the most sleep that they can. The use of scheduled naps is an example. There are different strategies that are applicable well before deployment, during training, to enhance not just sleep health, but also mental readiness.

Mr. Ted Opitz: Most soldiers are actually quite good at finding those catnaps.

Dr. Anne Germain: They're so sleep deprived they can fall asleep very quickly.

Mr. Ted Opitz: You learn to do it, and it becomes a skill, quite frankly.

Do you use any chemical markers? I saw in your presentation somewhere that you talked about serotonin. Do you experiment with melatonin levels and that kind of thing?

Dr. Anne Germain: What we've used in the clinic is prazosin. It's an alpha-1 antagonist that has been very useful. Actually, it's the medication that had the most evidence for treating nightmares related to post-traumatic stress, sleep disturbances, and insomnia as well.

There are two issues we have with pharmacological agents. One is what can we use in theatre that is safe, because people need to wake up quickly oftentimes and be ready to perform, and you don't want to have any of the residual hypnotic or sedative effects.

With people with post-traumatic stress, our typical sleep medications perform very poorly, except for prazosin. There are plenty of different agents that have been used with mitigated success. I think for pharmacological intervention, generally speaking, it's really an art combined with science to personalize what is the exact agent or combination of agents that will help people most in terms of sleep, and have the least residual side effects.

Mr. Ted Opitz: I also like the fact that it is a non-stigmatizing thing. It's a sleep disorder and people can accept that a lot better than other labels that are put on it. I think that's a very useful way of dealing with it, because there are the body rhythms and things like that and people deploy to different places, different times, and their body rhythms are not going to be regulated.

You talked about post-deployment and bringing people back and a treatment that you had that could work effectively in potentially as little as four weeks. If this helps our soldiers get back and mitigate a lot of these issues as they return, it will help mitigate some of the long-term effects.

Can you talk a little bit more about that, please?

● (0920)

Dr. Anne Germain: It's delivered over four weeks, but what really is involved is a single in-person session—and we have done it by phone or by Skype as needed—where we provide people with basic education about sleep physiology: what the mechanisms are that control sleep, and how we can change some behaviours while we're awake to facilitate alignment of these mechanisms that control sleep to improve sleep quality. Those are very simple, straightforward treatments. They are called stimulus control and sleep restriction. They do need to be personalized to work well, but we can provide the education and personalize the strategies in less than an hour with an in-person session.

Mr. Ted Opitz: All right. I just have about half a minute left here.

What have been your findings? What are your results from working with American soldiers with this treatment?

Dr. Anne Germain: Because of the fact that military people have extreme discipline, we can actually leverage that, provide them with information and basic guidance on what are healthy sleep behaviours. This includes: get up at the same time every day of the week no matter how many hours of sleep you got the night before; don't go to bed unless you're sleepy or sleeping; and don't stay in bed unless you're sleeping.

Mr. Ted Opitz: Do you have stats on its effectiveness right now?

Dr. Anne Germain: In just telling people—we actually give them a pamphlet with the information—we found that 50% no longer had insomnia within four weeks. They were good sleepers.

For those who spent 45 minutes with us in personalizing these sleep habits based on their own sleep patterns, 80% of the people were actually fully remitted from insomnia after four weeks. Four weeks from the initial in-person session, 80% no longer had insomnia. They fell asleep quickly, they stayed asleep, and they woke up rested in the morning.

The Chair: Thank you.

Mr. Harris.

Mr. Jack Harris (St. John's East, NDP): Thank you, Chair.

This is a fascinating presentation from both of you.

Dr. Germain, first of all, could I get one of those kits? I say that because, although it's obviously designed for extreme stress situations, it seems to me it may well have application quite generally in the population.

A newspaper article a couple of days ago reported on sleep as a therapy for depression and I was absolutely astounded at the findings. I studied psychology in my early days, and did a lot of work in the 1990s with people with post-traumatic stress disorder, and with those who had a lot of depression, etc., resulting from sexual abuse. The rate of recovery from depression being reported is astonishing; the best discovery since Prozac, I think the article said. I don't know if it was about your work or not. It's better than Prozac. How come it has taken so long to find this out?

Are there any lessons to be learned for the military in terms of how you operate? Maybe you don't need to get people up at 4 a.m. to run three miles unless it happens to be a war zone and you have to do it because it's part of the defence. Are there lessons to be learned as to how you treat soldiers in general as well as how you treat them after the fact?

Dr. Anne Germain: Absolutely. That work was by Colleen Carney at Ryerson University in Toronto. She's done an outstanding study.

It also shows that when you focus on sleep, you show dramatic improvements in depression.

The thing about sleep is it is transdiagnostic. It's not just true for post-traumatic stress or depression, it's true for anything that relates to mental health. When we target sleep we can have a direct impact on daytime symptoms, whether it's anxiety or mood disorders.

It is true for military populations. It's also true for civilians. I think it's a little bit different for the military because of the different sleep demands related to training and operations. That's why I was saying we need to adapt what we're doing so it does fit the reality of the military context, but it is definitely feasible. Treatments are adaptable and should be adapted to fit that reality.

Mr. Jack Harris: I think we all know about the sad but unfortunately too often occurring instance of the soldier in the basement, the post-deployed soldier who can't get out of the basement, or can't do anything because he is clearly depressed as well as frightened about going outside.

It strikes me that this therapy may actually hold some promise for that as well.

● (0925)

Dr. Anne Germain: Absolutely. Think about it. If you have a bad night of sleep, typically the next day your mood may be altered; you may be a little bit more irritable, and not as pleasant as usual. That's after one night. If you multiply that by thousands of nights of many years of service, you are going to have some impairments or difficulties in facing the world, in getting out of the basement.

The other truth is that when we have chronic sleep problems, it's just hard to handle things that are coming at us, so instead of exploding or having an argument with somebody outside in the street, people will oftentimes choose to stay in their basement. They use it as one of their avoidance strategies, to avoid arguments, avoid being hyperreactive.

Yes, if we start with sleep, not only can we improve sleep, but we can make people feel better, and make them feel that they are better prepared to handle what's coming up on a regular day-to-day basis.

Mr. Jack Harris: Thank you.

I need to ask Helen Zipes one question. A million dollars for this. Is that what you're saying? Did I hear you correctly? You said that you have 60,000 outpatient visits a year. That's about 160 a day for 365 days year.

Ms. Helen Zipes: Yes. Our outpatient program is huge.

Mr. Jack Harris: You seem real busy.

How many of these do we need across the country to be able to make a real difference in the problems we have?

Ms. Helen Zipes: Well, we have waiting lists for all our programs. We try to minimize the waiting times for our in-patients. For someone coming from acute care to an in-patient bed, we try to get them in as fast as possible, but—

Mr. Jack Harris: Is it the only one in the country?

Ms. Helen Zipes: No. There are rehab centres throughout the country.

Mr. Jack Harris: No, for this machine, I mean.

Ms. Helen Zipes: For this machine, there are two: ours and one in Edmonton at the Glenrose. There are other similar smaller units, but we were the first with the extended system.

Mr. Jack Harris: Thanks.

I have one last question for Dr. Germain.

In looking at “Sleep Across the Deployment Cycle”, on page 3 or 4, when I'm looking at the right-hand side and the sleep duration in hours, it looks dramatically different on the scale, but when you look at the numbers, we're looking at 6.46 hours to 6.56 hours being the big difference between the lowest and the highest. Is that significant?

Dr. Anne Germain: It is. This is self-reporting, so usually you have people overestimating how much sleep they get. The absolute difference does not look that dramatic, but I would suspect that in reality it's.... Well, 30 minutes of sleep is significant, so if it translates to 20 to 30 minutes and that's an underestimate of what really happens, you're thinking about a significant sleep loss during deployment.

Mr. Jack Harris: All right. Those are my questions.

The Chair: Thank you, Mr. Harris.

Mr. Norlock.

Mr. Rick Norlock (Northumberland—Quinte West, CPC): Thank you very much, and through you, Chair, to the witnesses, thank you for appearing today.

I'll start with a quick question for Dr. Germain.

Pharmacological sleep aids are good, but I know a lot of folks who prefer herbal or natural medicines...well, so-called natural medicines or natural products. Have you utilized those as sleep aids—because they tend not to have a lot of side effects like the traditional pharmacological medicines used—and what's the success rate?

Dr. Anne Germain: It's very low. That's the problem.

The primary difficulty with natural products is that there's no control for quality. Three milligrams of melatonin from one brand can be very different from three milligrams of melatonin from another brand. That's the primary difficulty.

Overall, the studies that have been done tend to be negative or to show very small effects.

Anecdotally, there are people who swear by these products, and it may very well work for people, but we don't have the science to determine the quality of different natural products or to be able to identify who is more or less likely to respond to any of these products.

Mr. Rick Norlock: Thank you very much.

With regard to the CAREN system, it's very interesting for the folks who have physical disabilities, but how does the CAREN system work for people with PTSD and other psychological injuries?

Ms. Helen Zipes: What we do is evaluate each patient and see what their needs are. Then we work on specific goals. We can alter the environment. We can alter the program.

For instance, for someone who has trouble concentrating, we would maybe have them in an easy environment, and then little tasks will come up on the screen that they have to attend to, or signs, so that they have to look at signs. There's one program in which you give someone a shopping list. They feel like they're in a store with a shopping cart. They have to reach for and look for different things. They have to be able to identify what's on their list and where to find it.

In Israel, they're using this system to work with children with autism. For instance, they have a streetscape, and they're teaching them how to cross the street safely and be aware and be safe in public.

Depending on what the issues are, we tailor the environment to the individual.

● (0930)

Mr. Rick Norlock: Thank you very much.

With respect to the CAREN system's potential for research, what research information have you been able to glean from the utilization of the system?

Ms. Helen Zipes: I'm glad you asked that.

I brought with us our package from our centre for rehab research and development. There are several experiments and studies using the CAREN system shown here. I can leave this with you to look over.

Mr. Rick Norlock: Would you do that, please, because our researchers would be able to make use of that as part of our study.

Ms. Helen Zipes: The great thing about the system is that we can get objective measurements from it, so we can put markers on the patient depending on what part or what we're looking at. We can get objective data, so you can see how much force they're putting through their prosthetic limb, you can see what they're attending to, and you can see what they're recognizing, what they're not recognizing. We get objective data.

Mr. Rick Norlock: I'm a great believer in customer satisfaction. What kind of feedback have you received from your patients in regard to their utilization of the system and how they feel after they've had the treatments?

Ms. Helen Zipes: They love it. Because it's realistic, it's exactly what rehab should be. You're making the person more functional in a normal environment, in a real environment. The men and women of the forces, especially, they really love it.

Mr. Rick Norlock: Commodore Hans Jung, former Canadian Forces surgeon general, has said it really pushes the envelope both in terms of the circumstances you can get into, but also the pace of advancement. His indication was this is truly a transformative technology.

Can you tell us about the speed of recovery with this equipment compared to other forms of rehabilitation?

Ms. Helen Zipes: That's what's so wonderful about this piece of equipment. For instance, the sergeant I showed you has an upper amputation, above the knee. Normally we'd work with someone like that for probably at least a good month before we'd take them outside on uneven ground. Now with this system, two weeks after he got used to his prosthetic limb, we had him using the system, getting the platform to go back and forth and in different directions. It sped it up by months. It gives them the confidence and they realize, “Gee, I can do this”.

The sergeant, for instance, mentioned to me one day that he used to be a golfer before his injury. My husband and I belong to a golf course here in town, so we invited him to come with us and try it. I said that if he could do that, I thought he could golf, and he did wonderfully; he really did.

Interestingly enough, the thing he had the most trouble with is that at our course the tee boxes are a little bit raised. Where there were steps, he was fine, but where there was just incline, he had a lot of trouble going up it. That was something we could go back and work on with him.

Mr. Rick Norlock: That's great.

Do some of the patients go back? Are most of the patients people who would be transitioning out of the armed forces or have just left, or have you treated patients who are serving members with certain disabilities and you're rehabilitating them to go back into some form of service in the forces?

Ms. Helen Zipes: That's a great question. All of the military patients we've had are active servicemen. While they're with us, that's considered their service and they are active members.

My understanding is there's quite a rigorous physical test that they have to pass in order to remain in the military, especially for some of them. We've had several patients who have stepped on IEDs, who are triple amputees, so they've lost both legs above the knee and an arm. Someone like that is not going to be able to pass the physical test to stay in the military. Someone like this sergeant is able to pass the test.

Part of the test is that they have to be able to walk a certain distance with a heavy pack, so we put the pack on them and they do training with it. There's another program with a rifle that they have to shoot at different things, and we can help train them and see how they do.

The reality is, though, that very few of our injured soldiers do remain in the military because of the difficulty in passing the exam. You have to remember that the rehab centre is a tertiary rehab centre, so we take people who have either been very severely injured in an accident or had a serious illness. We don't take people at the rehab centre who have just had a total hip or a total knee replacement. That's considered secondary rehab.

● (0935)

The Chair: Thank you, Ms. Zipes.

Go ahead, Ms. Murray.

Ms. Joyce Murray (Vancouver Quadra, Lib.): Thank you.

Continuing on this conversation, Ms. Zipes, do you work with anyone with PTSD but without physical injuries?

Ms. Helen Zipes: The majority of our patients do have physical injuries. That's why they're at the rehab centre. Colonel Jetly, I believe is his name, is a psychiatrist with the military, and he has submitted a project to us to work with patients from the military with PTSD who don't necessarily have injuries.

Ms. Joyce Murray: The reason I ask is there are some estimates that up to 3,000 of the armed forces members who served in Afghanistan may be presenting severe PTSD. If this is working as well as you're describing for normalizing some of the unexpected events and being able to do the physical tasks while doing mental tasks, there might be an application.

Ms. Helen Zipes: Absolutely. With our brain injury population, we have been working towards that, and Colonel Jetly's study will take it forward.

Ms. Joyce Murray: Yes, so severe PTSD is a brain injury.

Ms. Helen Zipes: Yes.

Ms. Joyce Murray: Is there any research that would take some of the principles of what this million-dollar machine does and develop more affordable Wii-type equipment that people could take home and continue to work, maybe not on a sophisticated level, but on some of the critical practices that they need for their rehabilitation?

Ms. Helen Zipes: Yes, one of the principles of rehab is that you want people to carry back to the community and to their homes what they've learned in rehab and to continue, absolutely.

Ms. Joyce Murray: Is that under development?

Ms. Helen Zipes: Yes, and where there's something that is commercially available, we use it, like the Wii.

Ms. Joyce Murray: I'm interested, Dr. Germain, in what you see as a pathway between the research on sleep and practical on-the-ground use of that research in the Canadian Armed Forces. Is that occurring now and in what way is it occurring? What would you see as a next step if it's not occurring? Can you talk about life in the armed forces? Where would it reside? Would it be in the JPSUs? Would sleep be a prophylactic?

Dr. Anne Germain: I was talking to Dr. Jetly recently. I liked his approach to mental health from cradle to grave, basically from the moment people sign and join the military all the way to the time they retire and after. I think sleep can reside all along the continuum of military service.

The transition from research to practice is relatively straightforward in sleep, because most of us who do the research are also clinicians, or work very closely in clinical settings. I have been fortunate to be able to build and maintain collaborations with active duty, different leaders in the U.S. military to be able to take what we do in our research lab out in the field. The war fighter sleep kit is actually an example of this.

There are different ways of doing this. I think for us researchers and clinicians it is to be able to embrace and consider the military realities and take that information back to how we package our treatments, to make it as feasible and practical as possible. Again, it's all the way through, from the time people sign up all the way through to the time they retire, and beyond.

There are different kinds of efforts that are currently being made. Oftentimes in sleep intervention, there is this myth that sleep hygiene is sufficient to improve sleep, so have some warm milk before you go to bed and take a hot bath. That may all be good and fine, but in people who have clinically significant sleep disturbances, those techniques do not work. There aren't that many that work, and the strategies that do work are very straightforward. That's why I was saying with respect to disseminating, we still have a lot of work to do to disseminate what we know works, that it's biologically driven, for sleep into different clinical settings.

Clinicians are trained that sleep hygiene is the way to do behavioural treatments of sleep problems, where we do know that sleep hygiene, if anything, is a good control condition in clinical trials, because it doesn't work. What does work is very specific behavioural changes that people have to adhere to, such as getting up at the same time every day of the week, no matter how many hours of sleep they got the night before, and not to be in bed or stay in bed unless they're sleepy or sleeping. They sound simple, but they're pretty hard to do. If you want to try it at home, tell me how long you can stick with it.

We do know that if people stick with it for three or four days, the first thing that happens is they get tired and sleepy during the day. It's a sign that the treatment works. If they stick with it for two weeks, usually they don't have insomnia two weeks later. There are very rapid improvements in sleep.

We see it in research. We see it in different clinical settings with what we've developed and others have developed that have been implemented. As long as clinicians stick with it and encourage patients to really make those behavioural modifications, it can be very effective.

In terms of how we take it to the field, again it's challenging. The war fighter sleep kit, to my knowledge, is the only package that has been put together. It does include way too much language, too many things to read. That's one of the reasons I was saying there's quite a bit of work to be done on this prototype, but it is a marker of feasibility. We can do some things like this. We've conducted focus groups to get active duty service members' and veterans' feedback on what they would need, what they like, and how we can package it.

We're working on having an app, for example, where people can enter their information and get automatic feedback of what kind of behavioural changes would be recommended based on the kind of sleep problems and sleep patterns they report.

It can be linked to a clinician. We have one in development right now that is linked to a clinician—right now it's me—who can see how different people are progressing or adhering to recommendations that come from the app that are really based on the same kind of decision-making tree that I would use in the clinic or in the research setting, and follow how people are doing. With very minimal clinician intervention, I can encourage people to adhere more closely to the recommendations. We can track if their mood is changing, not for the better. We can have interventions. They can text us, call us, e-mail us. We can definitely use technology to make sure that those are packages that people are willing and interested in using and that we're also not over-burdening clinicians.

● (0940)

The Chair: Thank you, Dr. Germain.

The time is up.

We are moving into our second round of questioning, five-minute segments. Ms. Gallant, please.

Mrs. Cheryl Gallant (Renfrew—Nipissing—Pembroke, CPC): Thank you, Mr. Chairman, and thank you to our clerk for arranging these fabulous witnesses.

My first questions have to do with the CAREN system. How long is the waiting list for soldiers as well as civilians?

Mr. Sean Gehring (Manager, Specialized Care Stream, Ottawa Hospital Rehabilitation Centre): Presently we don't have a wait list.

Mrs. Cheryl Gallant: You don't have a wait list, but it's still used.

Mr. Sean Gehring: The way the arrangement was originally set up was that we dedicate time, 40% to the CF patients and then 60% of time to the patients of the rehab centre, and within that time is the maintenance of the machine itself. Presently we don't have a wait list, although we haven't utilized the machine for research as much as we initially thought we would, but the projects are lined up to come through, so maybe a year from now we might be in a different position.

Mrs. Cheryl Gallant: Is this a unique machine or does it exist somewhere else?

● (0945)

Ms. Helen Zipes: There are other variations of this machine, but what's called the CAREN, the extended system, as I said, is only in four countries: Canada, the U.S., the Netherlands, and Israel.

Mrs. Cheryl Gallant: Do we own this technology?

Ms. Helen Zipes: As far as owning this technology is concerned, the firm that sells it is Motek Medical from the Netherlands, but the components are outsourced from different areas across Canada and the United States. The cameras may come from the United States and the treadmill from other places.

Mrs. Cheryl Gallant: It's not commercialized as a package and done across the country at—

Mr. Sean Gehring: In Canada there are only two sites, the Ottawa Hospital Rehabilitation Centre and Glenrose Rehabilitation Hospital, that have this particular version of this machine. There are universities that have the CAREN basic, which doesn't have the platform, and the pit, and the six degrees of freedom. It's basically standard treadmill force plates.

Mrs. Cheryl Gallant: In this, with your patients, do you have occasion to measure the brainwave activity concurrently as you're doing the—

Ms. Helen Zipes: No.

Mrs. Cheryl Gallant: Would that be the subject of a science experiment then?

Ms. Helen Zipes: It would depend on what you wanted to measure.

Mrs. Cheryl Gallant: Okay, it hasn't been used in conjunction or collaboration with your eye movement desensitization and reprocessing therapy at all.

Ms. Helen Zipes: Yes, actually with vestibular therapy, absolutely. You can cause the platform to perturb, to move in different directions, and depending upon what you're working on you can have the screen with different images. Definitely it could be used for people with vestibular problems.

We're learning as we use it as well.

Mrs. Cheryl Gallant: Okay, how is the CAREN used to help patients with traumatic brain injuries?

Ms. Helen Zipes: It depends on what the symptoms are or what the deficits with the patients are. Someone with a mild injury may have memory problems. They may have visual field problems. They may have neglect. Some of our patients, depending on where the brain injury is, may forget about one side of their body, so the system forces will force them to do different things to remember that, yes, I do have a left arm and a left leg, or it will force them to try.

We're always trying to give people a way of overcoming their deficits. I can give you an example. We had a young man who had a fairly serious brain injury. He looked very normal. If you saw him walking you'd think he was quite normal, but he doesn't have short-term memory. It's very hard to live if you don't have short-term memory, so we use technology to help him. One of the things we do is program his BlackBerry or his iPhone and it will beep, and we train him that when it beeps to look at it, and it will say, "get up, get out of bed, brush your teeth, eat, get dressed", or whatever is needed.

It's the same thing with this machine. For whatever is needed, our operator can write a program and insert things into it so that as you're walking and you meet someone.... What do you do when you meet someone? You stop, you say hello. There are things we can program to try to make it more normal for these patients.

Mrs. Cheryl Gallant: Okay, what about the complex regional pain syndrome? How has this been used?

Ms. Helen Zipes: With complex regional pain, for instance, in the shoulder, you have probably heard that people have frozen shoulders. Because of the pain you're not using your arm, and the more you don't use it, the weaker it gets. With this program there is one program where there are balloons, and you have to reach up and pop a balloon as you're walking. When you're immersed in the program you forget about your pain and patients will absolutely reach higher, because we have the objective data. If you do things with them in the gym and you just say, "Okay, I want you to walk your fingers up the wall", which is a common exercise, they don't get very far, but if you put them in this machine and they're walking and they sort of forget, and there is a balloon coming and they reach for it, then they go much farther. We have markers on their joint, so we can measure their shoulder and the range of motion moved.

The Chair: Thank you, the time has expired.

Madame Michaud.

[*Translation*]

Ms. Élaine Michaud (Portneuf—Jacques-Cartier, NDP): Thank you very much.

First, I want to thank you for your presentations. They were very interesting.

My first few questions are for Dr. Germain.

I was going to ask you a question about this, and I am pleased you spoke about it. You said that timely screening of sleep problems was good for diagnosing and effectively and quickly treating other mental health disorders.

What is the success rate for overall treatment of operational stress injuries when a sleep problem is involved?

● (0950)

Dr. Anne Germain: I'm going to try to answer you in proper French.

Based on the data we have on treating post-traumatic stress, be it through cognitive behavioural approaches or medication, the best we can expect is a 40% to 60% success rate. I'm not talking about remission here, but really a response to treatment. The success rate with the placebo is between 30% and 40%. Right now, treatment strategies for post-traumatic stress syndrome can improve symptoms, but full remission is rare. The same thing is true for depression.

According to a study published recently by Colleen Carney, when treatment for a sleep problem is combined with treatment for post-traumatic stress, considerable improvement is seen in the response rate and remission. Studies to date are too small for us to draw definitive conclusions. However, based on studies conducted so far, there is one area that has some potential, and it involves knowing whether the combination of treatment for a sleep problem and treatment of other symptoms, such as symptoms of post-traumatic stress, would result in a better success rate, not just for the response but for complete remission, as well.

Post-traumatic stress syndrome is not simply having anxiety in response to various stimuli while you are awake. It really is a sleeping and wakefulness problem. We should test treatments that manage to treat symptoms experienced at night and during the day. I would expect that the success rates will be much higher than they are currently.

Ms. Élaine Michaud: In another part of your presentation, you spoke about certain challenges related to pharmacologic treatments of problems like that. Could you also tell us about challenges related to overmedicating, and the abuse and misuse of prescription medication?

Dr. Anne Germain: That often happens with sleeping pills. Clinical practitioners are often reluctant to prescribe benzodiazepines to treat sleep problems because of the potential for abuse and dependency. Based on what we know, in any event, this type of medication is not really effective for military personnel, probably because they have a hypervigilance that the civilian population doesn't have, including those people who have chronic insomnia that isn't linked to post-traumatic stress syndrome.

I forgot the start of your question.

Ms. Élaine Michaud: You still answered it well. My question was about the challenges related to the risk of overmedicating, and the abuse and misuse of medication.

Dr. Anne Germain: There's also the issue of interactions between various medications. Someone may consult a clinical practitioner who prescribes a certain medication, and then that person consults a different clinical practitioner who prescribes another medication for something else. Communication between clinical practitioners must be very open and very clear to ensure that there are no negative interactions.

There's something else. Side effects are one of the main reasons why people don't take prescribed medications. For young male military personnel who are given an anti-depressant for post-traumatic stress, depression or a sleep disorder, the sexual side effects of such a drug will be the primary reason they don't want to take it. If they do take it, they do so very irregularly, when it won't interfere with the activities they have planned.

Ms. Élaine Michaud: Ideally, a combination of behavioural therapy and medication is used. Unless I'm mistaken, medication alone is generally somewhat effective.

Dr. Anne Germain: Yes, that's true.

Ms. Élaine Michaud: Thank you very much.

[*English*]

The Chair: Thank you.

Mr. Allen.

Mr. Mike Allen (Tobique—Mactaquac, CPC): Thank you very much, Mr. Chair, and thank you to our witnesses for being here. I apologize for being late. We have too many meetings around here.

I want to follow up on something. Dr. Germain, you were nodding vigorously when Ms. Gallant asked her question about scanning brain activity.

I'd like to get you to finish the thought.

● (0955)

Dr. Anne Germain: I'm a sleep researcher, so I started doing EEG research and looking at brain activity and how we use neuroimaging to address some related questions on sleep and on post-traumatic stress disorder.

I was nodding for a different reason.

If you can have objective markers for rehabilitation efforts or for post-traumatic stress disorder or for sleep that identify clinically significant improvement, or that can predict whether or not a patient is maximally benefiting from any kind of intervention to guide the clinical decision-making process that is going on.... For example, if we had any biological marker to indicate that a person is not likely to respond to medication, we wouldn't necessarily add another medication or keep them on the same treatment for an extended period of time. Knowing early on that they're unlikely to respond, we could intervene very quickly and adapt and re-evaluate the treatment plan to get to success and treatment much faster.

I was nodding because EEG is kind of dear to my heart, but also because it broadly and more globally touches on the questions of identifying objective markers of the recovery process and likelihood of response to treatments.

Mr. Mike Allen: Okay, thank you.

I subscribe to a Twitter post from a fitness place. One of the comments this morning was that the best bridge between despair and hope is a good night's sleep. It is interesting that we're hearing that this morning as well.

Referring to your slides, in one you talk about sleep across the deployment cycle and match that to the next slide, which is the non-deployed service members. As I said, I wasn't here at the start, but for the non-deployed, it says that the odds of trouble sleeping are less, but then the other one says that non-deployed service members sleep less.

Dr. Anne Germain: They are different things. One is the likelihood of having difficulty with sleep during the deployment; the other one is a survey of how many hours of sleep you get even when you're not deployed.

In this case, it was 72% of people who said they slept on a regular basis six hours or less. I know we would all like to sleep much less than we do so we'd have more time to do what we need to do, but six hours of sleep is cutting it short. It does have serious impacts on our functioning. Imagine how that is for service members who are exposed to different kinds of challenges.

Mr. Mike Allen: Okay, good.

Thank you.

Ms. Zipes, I want to ask you about the evolution of the technology you're using today. One of the comments you made was that before it was six months on even ground just to get an assessment on this, but you're moving much quicker and you're able to assess.

Can you comment a little about the evolution of the technology to get to where you are today, and how you see that going? What types of investment is it going to take to continue the progress on those types of tools?

Ms. Helen Zipes: Well, we're certainly learning as we're using it. We like to listen to the patients on what their needs are. They help us to determine what programs we have to develop. It's based on the feedback we get from them.

Certainly if you have a Wii machine, it's the same idea. You're interacting with a screen. Then the next generation had an avatar of yourself in the screen. Here there are some programs where you're actually in the screen because we can put the markers on.

I took a group to Israel to see how they used theirs, and theirs were much more primitive than this. We have two treadmills. Our platform moves in many more directions. Certainly as we're using it, we're finding things, and we're giving feedback to the company as well.

I don't remember whether we have a pneumatic system. It originally came with one system underneath it to move the actuators. It didn't work and it had to be changed, and the company changed it for us.

Mr. Sean Gehring: We used to have hydraulic actuators and now we have electrical ones.

As Helen was alluding to, one of the main things would be the ability to have that development time. The machine, as it sits presently, and the technology, are quite advanced.

One of the questions before was whether this is used with occupational therapy. Normally the way it works is that the technology and the treatment plans are taught to the students coming through, and they bring in new ideas. We're actually ahead of the schools now. When the graduates are coming out, we're educating them. We're actually having to say, “This is the new technology that's out there. How can you use this in your treatment plans?”

It's definitely the development and having time for the operator to say okay, and sitting down with the clinicians to ask what they need to better treat their patients.

● (1000)

The Chair: Thank you very much, Mr. Allen.

Mr. Larose.

[*Translation*]

Mr. Jean-François Larose (Repentigny, NDP): Thank you, Mr. Chair.

My first question is for Dr. Germain. I would like to thank you for being here and for your presentation.

You mentioned that you worked with the American armed forces. You were in contact with senior officers. I was trained in the Canadian armed forces reserve. I remember the lack of sleep. It was basic training, in part because you have to experience major crisis situations.

I wondered if the training component of some programs in the United States had changed completely based on your studies.

Dr. Anne Germain: No, but that's my goal.

Some changes have been made, mainly…

[*English*]

in the air force.

[*Translation*]

We are making various efforts to manage fatigue to protect sleep to ensure that pilots and their team are well rested when they are on a mission. Everyone has a war fighter's sleep kit now. Military personnel get one as soon as they are deployed. If they've heard about them, some of them have two or three.

However, we are seeing this mainly in the United States Air Force. It's happening within other units in other branches. As you said, it really depends a lot on the leaders. If the senior officers think it's important to protect the sleep of their soldiers or troops in order to preserve mental health, they take care of it.

[*English*]

It's really hard in French.

Across the different branches it really is dependent on the unit and the leadership because when leadership changes, not necessarily regularly, the priority changes as well.

We have found ourselves having similar discussions over and over again. I don't mind, I think it's part of our mission to disseminate information and educate people. The reality of different units is so different from one deployment to another. Even when they're back home, the kind of work they have to do that we've had to work on, on an almost individual basis, is to see how we take what we know and adapt it to their reality.

I think there are guiding principles to what we do, but we haven't had the kind of penetration and dissemination that I would like to see happen. We're working our heart out on it.

Mr. Jean-François Larose: Is there some resistance also?

Dr. Anne Germain: I don't know that it's resistance, as much as there are so many demands and so many things that people have to address. Sometimes, unless sleep is already on their list, it's one more thing to attend to, and their priority is always the training, the preparation, and safety of their troops. Whether or not sleep makes it into one of the priorities, it's acknowledged as an important component. Whether or not they can implement some changes is really dependent on other kinds of demands, the resources and support they have, to be able to do that.

I would expect to see the same thing in the Canadian Armed Forces.

[*Translation*]

Mr. Jean-François Larose: Let's talk about program follow-up, with respect to the family bond. Because follow-up needs to be done afterwards. Are you looking at the possibility of designing kits in that respect?

Dr. Anne Germain: Yes. We are currently studying families where at least one member of the couple has completed United States military service or is still active in the army or one of the units. We are seeing that family members are having trouble sleeping, be it either spouse or even the children. Their sleep structures don't correspond to what we expect to see in families whose biological rhythms are regular, which shows that military service affects the entire family. Everyone has to adjust because everyone is affected by military service.

This area of research and practice has been neglected. We are just starting to look into spouses and children. We are also well aware that grandparents, uncles and aunts can also have sleepless nights thinking about their loved ones in Afghanistan or on other missions. We are starting to look at all that, but we haven't made much progress in the past few years.

Mr. Jean-François Larose: Thank you very much.

[*English*]

The Chair: Mr. Williamson.

Mr. John Williamson (New Brunswick Southwest, CPC): Thank you, Chair.

Dr. Germain, I have a follow-up question to some of the questions Mr. Allen was asking with respect to the sleep deployment cycles. I certainly understand the impact if someone is not well, but what would account for the variation when service members are at home, not deployed? Is that just training? Is that just the body rhythm? What would explain that?

● (1005)

Dr. Anne Germain: I think it's the training, what kind of job people have, probably partly social aspects, as well, and high demand, I think, would account for this.

In this particular study, they didn't measure what kind of factors can contribute to shorter sleep duration.

Mr. John Williamson: Right.

Now, when you say “study”, which one are you referring to? I don't have the page number here. Was it Luxton et al, or Krueger and Friedman, or...?

Dr. Anne Germain: Krueger and Friedman was the civilian population, over 10,000 civilians. The data that they compared it to... or that I used to compare it to was what we see in military samples.

The other one is a study by Amber Seelig and her colleagues, looking at the likelihood of people starting to report sleep problems during deployment. There's an increase of about 20% when people deploy. That stays pretty high, or about the same, when people come home. Sleep duration goes down by about 30 minutes. When you think that people sleep about six hours, 30 minutes is a big proportion of sleep.

Mr. John Williamson: Yes.

Was there any sense, from the study looking at those who had been deployed, of the duration that it was over? Is this, for example, immediately afterwards for some period?

Dr. Anne Germain: This particular study looked at people who had been back for, I believe, three to nine months. This is just an example of the studies. Most of the studies that have been done so far have looked at people from three months to a year post-deployment, or further than a year.

We do know that even five years after deployment, if people have sleep problems when they come home, they tend to still have sleep problems five years later.

Mr. John Williamson: Interesting.

On the previous page, adapted from Seelig 2010, the graph on the right shows sleep duration in hours. We're talking here of service members, and this says non-deployed.

Dr. Anne Germain: Seelig is all people who had deployed and then came home, or during and after deployment.

Mr. John Williamson: Right. Okay.

Would the non-deployed be those who had never been deployed?

Dr. Anne Germain: At all.

Mr. John Williamson: Not at all. Okay.

Thank you, Mr. Chair. Those are all the questions I have.

The Chair: Thank you.

Mr. Brahmi.

[*Translation*]

Mr. Tarik Brahmi (Saint-Jean, NDP): Thank you, Mr. Chair.

My first question is for Dr. Germain.

Like a lot of Quebeckers who see people like you, I want to ask you a question. You said that you studied at the University of Montreal. Why did you decide to go to the United States? It's not really what we're looking at here, but it has to do with the issue of retaining doctors. Did you choose to go to the United States because you had an opportunity to do studies there that you couldn't do in Canada or to get access to programs we don't have here?

Dr. Anne Germain: When I left Montreal to do my post-doctoral training in Pittsburgh, my main goal was to learn how to use the various neuroimaging methods so I could study sleep in people with post-traumatic stress syndrome. I've been doing the same thing for a long time. For 20 years now, I've been studying sleep in people who have nightmares, who have post-traumatic stress syndrome. I was trained in neurology, and I was familiar with various methodologies, but Pittsburgh gave me the opportunity to learn to use neuroimaging. Those types of studies enabled me to answer the research questions I was asking and to improve my clinical practice in sleep medicine.

I had to return to Montreal. I left thinking that I was going to return to Montreal and bring back this expertise and do the studies here. My training was demanding and took longer than I initially thought.

It also has to do with when I left. I left in 2001, which was when NATO operations in Afghanistan started. Then in 2003, the United States invaded Iraq. At the time, there were various possible grant sources for research related to post-traumatic stress syndrome and sleep, which was not very popular up until 2001. I applied for grants and had access to a fairly large research program that developed very quickly. That's what kept me in Pittsburgh.

● (1010)

Mr. Tarik Brahmi: Okay.

I also wanted to have you talk about the graphs showing sleep in the deployment cycle. We see the data during deployment periods, and the actual hours of sleep, as you said, or the perceived hours of sleep that the individuals in the study report. Does the methodology take into account the fact that certain operational constraints during deployment, such as guard rotations or interrupted or unplanned night operations, prevent a person from sleeping? During deployment, soldiers don't necessarily get to sleep for eight hours, even if they want to.

Dr. Anne Germain: Absolutely. You reminded me of something else that's important to mention. The issue was trying to determine how many hours of sleep people get in a 24-hour period. It wasn't necessarily 6 consecutive hours. People might get close to 6 hours of sleep in a 24-hour period.

So yes, you are absolutely right.

Mr. Tarik Brahmi: Perfect.

I have a question for Ms. Zipes.

The study mentions the number of patients treated in your laboratory. Most often, you're treating cases of brain injuries. You said there are two types of brain injuries: traumatic and acquired. Can you quickly explain the difference between the two and perhaps give us some examples? The examples of applications that you gave us are particularly interesting. Could you give us some examples of rehabilitation methods for the two types of brain injuries? I imagine we aren't talking about post-traumatic stress syndrome in this case. We're really talking about lesions or physical injuries that affect the brain directly.

Could you give us a bit of an explanation of the difference between the two and provide two typical examples?

[*English*]

Ms. Helen Zipes: Sure, with pleasure.

When you have a brain injury, whether it comes about through illness, if there's a brain tumour, if there's a space-occupying lesion, depending on what area is affected.... It could be that a certain area is affected because of, as I said, some sort of an illness, an infection, or a tumour, or there could have been an accident. If you're in a car accident and you have actual trauma to the head, or you have a gunshot wound or something that's not illness, that's what we usually consider traumatic.

You can have the same outcomes though. It doesn't matter the method of the brain injury. What's important is where the injury is and whether it is stable or it's progressing.

The brain is very interesting. Depending on where the injury or the illness was, there are different effects. Some of our brain injury patients can have memory problems. Some of them are aggressive. We have four beds that are actually in an area of our unit that we're able to lock, because they just cannot control their aggressivity. There are other patients who, if we left them alone, would just sit in a chair all day. They wouldn't get up. They wouldn't eat. They wouldn't get out of bed. We have to stimulate them.

It depends on what area is involved, and it also depends on whether the injury is progressive or static. These are the symptoms.

With all of our patients we always do an assessment. We see what the deficits are and then we determine what we have to work on.

The Chair: Thank you, Ms. Zipes.

Mr. Bezan.

Mr. James Bezan (Selkirk—Interlake, CPC): Thank you, Mr. Chair.

I want to thank our witnesses for coming today. It's especially nice to see Dr. Germain again. Last year we had a PTSD forum, and that's where I got to see your work and hear all the great things you have to say about the importance of sleep.

Mr. Brahmi was talking about why you're in the States. You do have opportunity, though, to come back to Canada, I'm sure, at other institutes. My understanding is that you have been actually involved with the Canadian Institutes of Health Research.

Dr. Anne Germain: Yes. I'm starting discussions with them just as I did today, promoting sleep as a core component of mental health. I'm very interested in depression and anxiety. I think PTSD has a unique position to play in that institute with regard to integrated sleep.

I know Dr. Merali has been here, and one of his three recommendations was focused on sleep disturbances, so I was pleased to read that.

There are many opportunities now in Canada. When I decided to stay in the U.S. in 2005, I had been thinking of coming back to Canada, but I could not find an institution that had the sleep research and the neuroimaging capabilities I needed to push my research forward. I knew down the line they would be. From what I understand now, there are very rapid developments that bring all of these resources together in Ottawa and in different centres in Canada as well.

As I mentioned to the chair earlier today, all I hear consistently from the Americans, the Dutch, and the Australians is that Canada is ahead of the curve in the kinds of programs the Canadian Armed Forces has for mental health, from training all the way to post-deployment, and even when veterans are separated from the military.

I think on the military side, for different reasons, there's definitely a very different approach already in place in Canada, and for people like me, and for young investigators, that will provide very unique opportunities for research and for translation of research into clinical and practical applications.

● (1015)

Mr. James Bezan: The work that you're doing, whether it's here in Canada or whether it's down in Pittsburgh, is being shared with all our allies. You said the CAREN system is in operation. It's a Dutch invention used in—

Ms. Helen Zipes: Four countries.

Mr. James Bezan: —four countries, including Canada. It's available to anyone, I suspect, who wants to make use of it, the same as the research that you're doing now.

Ms. Helen Zipes: Yes, absolutely. In fact, there is a CAREN conference going on out west right now that Sean is going to go to tonight. We hope he'll be able to get out. Yes, we share. Israel was great sharing with us. When we went there, they gave us all their protocols. We were so much farther ahead because of what they shared with us, and we are looking down the road at some shared collaboration and research projects. We've been to Walter Reed. We've seen again how they used the machine. We've learned from each other.

Mr. James Bezan: Dr. Germain, with your study on sleep and PTSD, have you been able to quantify an improvement in PTSD outcomes by having better sleep patterns?

Dr. Anne Germain: Yes, we usually see reductions or effect sizes above 0.5. There is moderate to large effect size in improvements in daytime PTSD. That would be a reduction of at least 30% to 50% in daytime symptoms severity by treating sleep. If you sleep better, you're less reactive. You're in a better mood. You're less anxious. You're less fearful of different things. Now we don't treat PTSD; it's very rare. It's happened, but it's very rare that only focusing on sleep is enough to treat PTSD, but it does give us a leg-up in the treatment of post-traumatic stress, which is emotionally demanding and often scary for people.

Mr. James Bezan: I know a lot of the members have been focusing on your finding that non-deployed service members sleep less than civilians. About 72% are sleeping six hours or less in the military, while 73% of civilians are sleeping more than seven hours. I'm trying to extrapolate here, based on your categories of non-deployed, during deployment, and post-deployment. Are you saying it's 30 minutes less sleep during deployment?

Dr. Anne Germain: That is reported over a 24-hour period.

Mr. James Bezan: If you reduce that by 30 minutes, all of a sudden that number is going to be climbing up. Close to 90% of our military in deployment are getting less than six hours.

Dr. Anne Germain: I'll take a wild guess and say that this is what I would expect to see, except for the American air force. I'm sure it's the same thing in the Canadian air force. There is so much emphasis placed on making sure that people are not fatigued, that they're well rested, that they can operate during long flights in different kinds of missions. Those are probably the 10% of the people who have protected time for sleep in the air force, and the rest of the service members will have much less than the six hours.

The Chair: Thank you.

We have time for one final round.

Mr. Harris, do you have final questions?

● (1020)

Mr. Jack Harris: Yes, thank you.

In your comparison of service members with civilians, I'm assuming you're choosing males and females of the same age.

Dr. Anne Germain: No, I used two samples: active duty service members in the army, which was where most of the studies have been done; and one of the largest civilian studies that we have about sleep needs and sleep duration in the general population. This is a contrast of what we expect to see in the general civilian population versus what we find with active duty service members, in this case, army members.

Mr. Jack Harris: I'm interested in the implications of your work for the mental health of soldiers in general. Mr. Opitz comments that soldiers are used to taking catnaps, but what you're telling us is that they don't. What policies could we adopt to account for what you've found?

Dr. Anne Germain: I don't know because they would have to be informed not only by the kind of observations we have and we find when we look at this relationship between sleep and mental health. With military service members from the get-go, I believe, there's a self-selection bias. To be able to even complete the training, you have to be able to take quite a bit. I've always said that the people I've worked with have constantly reminded me of how resilient and how tough they are, and I do believe that it's a self-selected population that is just at a higher capacity to take on and sustain chronic challenges, relative to the general population.

Regarding the kind of policies we would make, we would have to be careful that the signal we convey with these policies does not therapeutize or make the military people seem or sound vulnerable because of the kind of work they do. Those are people who choose to do what they do, and I think there's a selection bias in who chooses to do that. We'd have to be able to evaluate, which we haven't done much, what the factors are that provide resilience and strength to allow these people to take it much more than I can, for sure.

Mr. Jack Harris: The caveat, though, is the very first quote that you gave us, that this is great, except that it produces gradual weakening leading to sudden and unexpected collapse.

Dr. Anne Germain: Yes, with the chronic...and starting from this basis of resilience and building on this, under any kind of chronic challenge, it doesn't matter how tough you are, at some point you will break, and sleep is often one of the factors that we put aside, that we don't think about. Actually, the more sleep deprived we are, the worse we are at evaluating how well we're functioning, so eventually we think that we're not affected by it anymore, but objective measurements show that we're actually continuing to decline in any kind of performance that we measure.

I think in making policies we need to be mindful that it's the chronicity of the sleep challenges, sleep disruptions, or sleep restrictions that happen that has to be taken into consideration. In the same way that the Canadian Armed Forces have third location decompression to allow people a buffer between the time they leave the theatre and the time they come home, we may want to think about having a decompression period for sleep too, where you can sleep.

It's hard to convince people that they can use their time sleeping. They prefer to play video games, call home, go out with their friends, or go to the gym. I do think that in terms of policy, we'd have to make it a priority that, just like being able to pass certain PT tests to maintain performance and achieving a certain level of marksmanship for people to be able to keep their jobs, there should be a certain level of sleep performance, however we would define that, that should be maintained to ensure that people are best prepared to face the kinds of challenges they have to face.

Mr. Jack Harris: Well, I think you're clear that this doesn't have to affect the operational requirements.

Dr. Anne Germain: No, it does not, and it should not either.

The Chair: Thank you.

Go ahead, Ms. Gallant.

Mrs. Cheryl Gallant: I'd like to start where we left off on the CAREN system. We were talking about the use of it in regional pain syndrome. You were explaining the exercises that the patient would go through. How do you transfer what that patient is doing while in the CAREN system to everyday life? How do they remember that yes, they can reach for something?

● (1025)

Ms. Helen Zipes: One of the great things about the system is it gives them confidence. What we would do in a case like that is show them the results. We could say, "Look, you actually raised your arm 120 degrees", or whatever. Then we'd give them a series of exercises, a series of tasks to do at home, and the expectation is that they would follow through at home. It really does give them the confidence, and make them think, "Gee, you know, I did that and it's not killing me. I can really do it."

It has been a very valuable tool that way.

Mrs. Cheryl Gallant: Thank you.

Dr. Germain, I missed the first part of your presentation, but you have a slide showing cross-sections of the brain and indicate that sleep disturbance is not an invisible OSI. Would you relate to me what the difference is between the yellow and the red and the green activity?

Dr. Anne Germain: I didn't talk about that during my presentation to make sure I would be within the 10 minutes.

What you see there, the yellow and the red spots are hot spots in the brain, areas of the brain that are more active in one condition, for example, during sleep as compared to wakefulness. Those are areas of the brain that are hyperactive when people are sleeping or when they are awake, and whether they are in dream sleep or whether they are in what is supposed to be deep restorative sleep.

The slides that you see here, and these are active duty service members and veterans who were combat exposed during operations either in Iraq or Afghanistan, show that, consistently during wakefulness, as we know, pretty much all of the brain is red hot or yellow hot. It's actually localized to regions and circuits that are involved in threat response, goal-oriented behaviours, and motor preparedness. They're on the lookout, basically. They're ready to react.

What we see during sleep, during dream sleep, is that the brain doesn't change that much. They're still hyper-vigilant, ready to react to any kind of threat while they're sleeping, while they're dreaming. We do know from subsequent studies that a lot of these patterns are actually very tightly related to having nightmares.

The other slides are also looking at the same things. Red or yellow means more active brain regions. When we looked at people in deep sleep, with and without post-traumatic stress disorder, we asked the question, which regions of the brain are more active in deep sleep, which is supposed to be the restorative sleep, than in wakefulness. In those with post- traumatic stress disorder, again, you see consistently those brain networks that are involved in threat response, goal-oriented behaviours, motor preparedness, and hyper-vigilance being hyperactive.

What was surprising in the study was we found that even those who do not meet the diagnostic criteria for, or have very little symptoms of post-traumatic stress disorder, show the same kind of activation pattern during sleep as those who have PTSD. In other words, those who don't have PTSD but were deployed many times, on average three or four times for people in these studies, have this hyperactive brain; they're ready to react, ready to detect threats very quickly in the stage of sleep that is supposed to be restorative. We think this means there is an impact of chronic stress exposure on the brain that has not completely gone away even two or three years after people are back.

Mrs. Cheryl Gallant: You mentioned the word "restorative". This appears to dovetail nicely with the study that was published last month, I believe, wherein you need the amount of sleep to wash away the toxins within the brain.

Can you relate what is shown in these cross-sections to that particular study?

Dr. Anne Germain: I wish I could, but I can't. I can only speculate.

The study showed that during sleep in animals—I believe they were rats, not mice—brain cells shrink, which increased the amount of liquid that can be cleared through the cerebral spinal fluid. One of the implications for that animal study was that it may be a way for the brain to get rid of the toxins that accumulate while we're awake and that it happens while we're asleep. Whether or not the same is true in humans, we do not know. I would suspect that with the brain that remains as active in sleep as it is when it is awake, as we see in these people, if there is a similar mechanism at play in humans, it would be prevented by this level of activity. If your brain is not really sleeping, then you wouldn't have the opportunity to clear your brain of those toxins, however this happens, but we do not have human data to support this.

● (1030)

The Chair: Thank you.

Ms. Murray, you have the final questions.

Ms. Joyce Murray: Thanks.

More on sleep, when you talked about the word "restorative", but also the idea of sleep [*inaudible—Editor*], I've also heard from others that it doesn't work that way, that when you've lost the sleep you've lost the sleep.

Can you talk to us a bit about how that works?

Dr. Anne Germain: On sleep debt, I can give you a very concrete example.

Let's say as a person you need eight hours of sleep, which is on the long side, as most of us need seven hours of sleep, but let's say that you need eight. Because of work, during the weekdays or school days, you can only get six and a half, so you have five days a week where you accumulate an hour and a half of sleep debt. Even if you catch up on weekends are you going to catch up all the hours that you lost during the week? Usually the answer is no, because there are other demands on the weekend, and even if you can sleep in a little bit later, it may be for an hour or two, but certainly it would not be seven or eight hours more sleep that you would get over the weekend.

We're chronically sleep deficient. We don't accumulate sleep. You can't prepare to sleep longer because you know that you won't be sleeping the next 24 hours as much. That, too, doesn't accumulate. There is a limit on how much sleep the brain can produce over a 24-hour period, or in a consolidated sleep episode. It doesn't matter how much we try to cut it or extend it, we can't do that as a preventative measure.

The best we can do is have a regular amount of sleep that is occurring at regular times, that is expected, and of the quality that is hopefully satisfactory to the point that you wake up rested.

Ms. Joyce Murray: Thank you.

Has any of your research actually tied a healthy sleep cycle to the lower likelihood of mental health effects from deployment? One thing I've heard is that it's not always predictable who's going to suffer from severe PTSD because, in a given situation, some of the armed forces members will suffer and others won't.

Has there been any research that connects healthy sleep as a preventative in terms of mental health challenges after deployment, such that it could be seen in the same way you learn to clean your equipment and to do certain things, that healthy sleep is part of that preventative set because the research shows or predicts for lower problems?

Dr. Anne Germain: We have to have a longitudinal perspective study to really address this very important question conclusively. We don't have that. What we do have is prospective studies that kind of implicitly looked at the relationship between sleep and mental health outcomes and found that those with more sleep problems, with more mental health issues and difficulties post-deployment.... Implicitly and embedded in this data is where we see that those who don't have sleep problems during deployment, or those who have problems during deployment but can actually go back to a relatively healthy sleep pattern once they come back, are the ones at the lowest risk.

It's kind of by exclusion or by default embedded in the longitudinal studies that are available where we see that those without sleep problems or with fewer sleep problems are those who do better. In terms of intervention, it's mostly coming from clinical trials, relatively small studies, but prospectively to see if prior to deployment or during deployment or immediately after deployment, if we have everybody get sleep intervention and we follow people over time to see who uses it, if their sleep gets better, and if their sleep gets better, did we lower the risk of mental health issues.

I don't know that any studies have actually been done specifically to answer those questions.

Ms. Joyce Murray: Is sleep health part of a standard kind of assessment of a person pre-deployment, and is there a way to tie that into a larger—

Dr. Anne Germain: The only place where sleep shows up in pre-deployment or post-deployment assessments that are mandatory in the U.S., and I'm sure in Canada as well, is one of the screening questions asked about nightmares and another one asked about insomnia.

The nightmare question is embedded in the PTSD screening, and the insomnia question is embedded in the depression screening, as if those sleep disorders are secondary to having the other disorders. We know that they're not secondary. They are co-morbid or oftentimes precede the occurrence of depression or post-traumatic stress disorder. To ask how is your sleep, I know for a fact in the U.S. military is not a screening question.

● (1035)

Ms. Joyce Murray: Would that be helpful?

Dr. Anne Germain: Yes.

The Chair: Thank you very much. Our time has run out.

I have a couple of very brief questions, finally, for Dr. Germain.

Is the war fighter sleep kit available to Canadian Forces?

Dr. Anne Germain: Yes, it's available to everyone.

The Chair: Has it been acquired and distributed, to your knowledge?

Dr. Anne Germain: Not to my knowledge.

The Chair: To your knowledge, have the Canadian Armed Forces taken steps with regard to sleep analysis, sleep therapy, for operational stress injuries, including PTSD?

Dr. Anne Germain: As I said, I talked to Dr. Jetly recently, and I do believe that sleep is one of the main components they're looking at integrating. I don't know exactly what shape it has taken.

The Chair: Thank you, Dr. Germain.

Thank you, Ms. Zipes.

Mr. Gehring, it has been a truly informative session this morning. Some of your testimony is in fact quite exciting. Thank you very much.

We have a little bit of housekeeping to do for a moment, but you're released from the table.

We'll suspend for a couple of minutes.

● (1035)

(Pause)

● (1035)

The Chair: We'll resume. We have a few minutes.

We have a tabling of a document with regard to the meeting in Europe in Dubrovnik, Croatia, attended by Ms. Gallant and Mr. Harris.

Mr. Harris.

Mr. Jack Harris: Yes, sir. It's my motion, which I gave notice of:

> That the Committee receive and consider Policy Recommendations adopted by the NATO Parliamentary Assembly at its Annual Session in Dubrovnik, Croatia on October 14, 2013.

There's a package which I think the clerk has available or has distributed.

The Chair: It will be distributed now.

Mr. Jack Harris: There were seven policy resolutions adopted. I'm going to ask Cheryl Gallant, as the head of the delegation from Canada to Croatia, to speak to these resolutions. Perhaps I could make a few remarks afterwards.

The Chair: Ms. Gallant.

Mrs. Cheryl Gallant: I'm not going to go through every resolution, but I commend Jack for bringing this forward. I might give a little background on why I think Jack did this.

The NATO Parliamentary Assembly is comprised of members just like us sitting around the table. We find that smaller countries send their opposition leaders to these, because they're training grounds for defence ministers. Most recently the current Prime Minister of Norway was a member of our association, so it was a superb training ground for her on many levels.

In a number of these countries they also table the resolutions made at the NATO PA for study by the standing committees on defence in the respective parliaments.

I would like to hone in on one resolution that was introduced to various parliaments in Europe during the combat aspect of the Afghan mission. This had a practical effect and quite possibly changed the direction, but certainly saved lives. It was Resolution 336 on reducing national caveats. The problem we had in Afghanistan was that every country had its separate rules of engagement and caveats, wherein a country would not permit their soldiers to be part of certain operations. There was a point at which they could not participate or were withdrawn, and this made operational planning very difficult. Because only a few countries were doing the heavy lifting, they suffered an inordinate number of casualties. By bringing this forth at the MP level through the NATO PA, we were able to raise the awareness of the various countries, and it was very helpful in reducing the caveats so we had greater operational participation. That's the practical aspect.

In terms of the resolutions that were brought forth by Mr. Harris, I wish to draw your attention in particular to Resolution 403. It has to do with the economic and strategic implications of the revolution in unconventional oil and gas. Back in the spring when there was a study tabled saying that the United States would be energy independent in a few years, this had major reverberations in Europe, and not only because of the competition in manufacturing and all the economic aspects. If you look through the different aspects of the resolution, they're worried that overreliance on the promise of unconventional oil and gas will divert political attention away from... and noting that Europe faces a potential competitive shock. That's all about economics and competing in manufacturing for trade. Of course, in point 9 they refer to an oligopolistic force that is controlling a number of their countries' energy. I don't know who they're referring to there.

The real concern, and this is where it comes back militarily, is that the U.S. energy independence, together with the existing perception of a pivot away from Europe and the Middle East toward the Pacific, will leave Europe to shoulder more of its military costs in safeguarding the transport of energy, for example, ships patrolling the gulf of Hormuz.

That's why I'm drawing your attention to it. It has practical implications for Canada, and the real race is on to get that.... Which country is going to be the one to get the LNG to Europe? Whoever gets there first is going to get the best of the shipping contracts. In terms of building ships, they'll have a reputation of being reliable. Subsequent entrants may not be able to access the assets as easily; neither will they be able to start up, because the economics of starting up won't be there when somebody else has the lion's share.

● (1040)

That is why I wanted to draw your attention to this.

Maybe Jack has more that he'd like to speak to on the other resolutions.

Thank you, Mr. Chairman.

● (1045)

The Chair: Okay, thank you.

Mr. Harris.

Mr. Jack Harris: Thank you. I'll make some general comments.

The NATO Parliamentary Assembly, as Cheryl pointed out, has parliamentarians from the 28 NATO members but also from partners such as Russia, who are engaged in the NATO meetings and discussions, and also aspirant nations, like Georgia, Macedonia, Bosnia and Herzegovina. It's a very viable international forum for parliamentarians.

These resolutions are pretty close to consensus. They're very well developed. They come from different committees of the association. They're debated at these annual sessions, modified to satisfy objections that have been raised, and they're adopted. I think they are quite comprehensive and worth looking at.

I think the Afghanistan motion is particularly interesting, in terms of what's happening in Afghanistan after 2014 that they're urging member nations to engage in. I thought we should share them with the members of this committee who take an interest in these affairs. As members of NATO, of course, Canada has played a role in the parliamentary assembly, which does vote on these resolutions and passes them. Canada has played a strong role in the past, and I think we should continue to do so.

One feature of this meeting in Croatia, and it's a feature of all the annual sessions, is that the secretary general, in this case, Anders Fogh Rasmussen, appears at the beginning and makes his opening remarks. Then there's a two-hour accountability session where delegates get to ask whatever questions they want. It's done in camera, or charter house rules. It is a sort of accountability session, I would have to call it, and a viable valid role for members of this committee, or whomever wants to participate, to get involved.

We wanted to bring this to the attention of the committee to give the perspective as to what the parliamentarians of the member states are thinking and how they're viewing these important matters of world affairs and strategy.

The Chair: Thank you very much for your efforts on our behalf.

Thank you for your remarks, and thank you for the reading material, which after today's session should be consumed without disruption of sleep patterns.

The meeting is adjourned.