HOUSE OF COMMONS
CHAMBRE DES COMMUNES
CANADA

Standing Committee on Veterans Affairs

ACVA • NUMBER 027 • 1st SESSION • 42nd PARLIAMENT

EVIDENCE

Tuesday, October 25, 2016

Chair

Mr. Neil Ellis

Standing Committee on Veterans Affairs

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● (1540)

[*English*]

The Chair (Mr. Neil Ellis (Bay of Quinte, Lib.)): Good afternoon. I'd like to bring the meeting to order and welcome everybody here today.

Pursuant to Standing Order 108(2), and the motion adopted on September 29, the committee begins its study on mental health and suicide prevention among veterans.

Today we have here, as individuals, Claude Lalancette, and Dr. Nevin, Dr. Greg Passey, and Dr. Elspeth Ritchie televising in.

We'll start today with Mr. Lalancette giving a short statement. Then, we'll move to Dr. Ritchie and go through the panel. Each witness has 10 minutes.

Mr. Claude Lalancette (Veteran, As an Individual): Hello. Thank you for hearing me today. My name is Claude Lalancette. I am a veteran paratrooper suffering from mental issues. I have taken drastic measures to come before the committee today, and to bring something that has been ignored and overlooked.

Since I found out about mefloquine five months ago, I have been taking in information. I am overwhelmed by how the government is blinded by this matter. I have fought tooth and nail to educate my government today on the anti-malarial drug mefloquine. I am guaranteeing that after this meeting you will be looking at mental health differently. You must share the information that these professionals will be presenting to you today. It is your duty.

I will be testifying with three other brothers on this anti-malarial pill on Thursday. Please hear these professionals. They have been trying to say something for a while. In my eyes, lives depend on it. We must start the healing process, and you must seriously look at this matter with urgency and attention. This is a national health issue.

Thank you.

The Chair: Thank you.

We will now start with Dr. Elisapeth Ritchie on the screen.

Dr. Elspeth Ritchie (As an Individual): Good afternoon. It's a real pleasure to be here today.

One slight correction, it's Dr. Elspeth Ritchie.

The Chair: I'm sorry.

Dr. Elspeth Ritchie: That's a good Scottish name, and the Ritchie side came over, and we were in Canada before the American Revolution, so my roots go way back with you.

But today I'm going to tell you a story. It's going to be a brief story, but it will cover some 25 years.

I was an army psychiatrist until my retirement in 2010. I now work for the Washington, D.C., Veterans Health Administration, its hospital, but I speak as an individual, not as an organization.

The themes I am going to touch on today, over the last almost 30 years, are the lack of informed consent around the use of mefloquine; the lack of screening for post-traumatic stress disorder, traumatic brain injury, depression, and other psychiatric illnesses; the lack of documentation around both giving the medication and any side effects; how you distinguish mefloquine use from post-traumatic stress disorder and traumatic brain injury—PTSD and TBI—and there are ways to do it, but it is not always easy; and finally, the intersection that we have seen through time with combat warfare and domestic violence.

So I'm going to pick three points. The first point is Somalia in 1993; the second point is Fort Bragg in 2002; and the third is the long wars in Iraq and Afghanistan, but focusing on the massacre of Afghan villagers by Staff Sergeant Bales in 2012.

I hope my tale will lead in to what Dr. Nevin and Dr. Passey will be testifying to.

I deployed to Somalia in 1993 as part of Operation Restore Hope. I was with the combat stress control out of Fort Bragg, North Carolina, the 528th—and if you're in the army at this point you say, “Hooah”; the marines have a different version. The first night that I got there, there was an army soldier evacuated out of Somalia, out of Mogadishu, who was totally psychotic. We later learned that he had probably taken mefloquine on a daily dose, rather than weekly as prescribed.

Back then, in 1993, we did not know that much about the neuropsychiatric side effects of mefloquine, and we sat in the circles with the preventive medicine officers and debated the risks and benefits of getting malaria versus using mefloquine, and we thought compliance would be enhanced by taking a medication that was once a week, rather than daily, as are Malarone and doxycycline.

So mefloquine was widely accepted—I took it myself—but there were, at that time, the beginnings of rumblings about “mefloquine Mondays”, or “psychotic Tuesdays”, or “rage Thursdays”; the days that the battalions would be administered in formation, and the bad dreams and the nightmares that followed. And then one day I was asked to do an assessment on Corporal Matchee. You know that story well. He had tried to kill himself the day before because of an investigation into the torture and murder of a Somali boy. When I went to see Corporal Matchee, he was comatose, essentially brain dead—at least we thought so at the time.

The rumours began to grow about the increased irritability and violence that mefloquine led to. And I'm sure you're going to come back to that time in Canadian history, because your military has never recovered from that investigation, that incident.

I'm going to go forward to Fort Bragg in 2002. At that time, 9/11 had happened and we were sending troops into Afghanistan; they were deploying.

● (1545)

In the summer of 2002, there were four murders of wives and two suicides at the same time. The staff sergeant was a cook named Griffin. He never deployed. He was not on mefloquine. The next three were Sergeant Nieves, Sergeant Floyd, and Sergeant Wright. I was part of a team that came down. I was working at the Department of Defense health affairs at the time. I went with an army team. We looked at the intersection of mefloquine and violence.

Again, a recurring theme here is that it's hard to sort out what is what, but let me tell you briefly about these situations.

Sergeant Nieves had just returned from Afghanistan. He was on mefloquine. He and his wife argued, and he shot her and then himself. Sergeant Floyd had come back six months before he killed his wife and himself. I thought at the time then, as did all of us, that if the drug did influence behaviour, that would have been six months ago. He was acting paranoid and weird at the time of the murder. Finally is the case that troubles me the most to this day. Staff Sergeant Wright was a high-speed, low-drag, special forces soldier. He had gotten promoted, and came back, and was on mefloquine. He either clubbed his wife to death with a baseball bat or a cup or strangled her—it's not clear—probably in front of his kids. He dragged his wife's body off to a shallow grave where he led police three weeks later. He went to jail. He was allegedly delusional, paranoid, anxious, and seeing and hearing things in jail. He hanged himself six months later.

Back then in 2002 we thought the incidence of neuropsychiatric side effects was very low, like one in ten thousand or one in sixteen thousand. The research done was often done on travellers from the Netherlands who were going to Thailand and taking hallucinogens, and how could they attribute this to mefloquine? But in the years since then, partly because of the work of my colleague Dr. Nevin and others, we've recognized the increased incidence of neuropsychiatric side effects, so most estimates are 25% to 50% of people on mefloquine have neuropsychiatric side effects depending on how we define the effects such as bad dreams or nightmares. Dr. Nevin's going to talk about this a little bit more.

I'd like to close with a couple of cases. In Iraq we were on mefloquine the first year we were there, but then it was found not to have much malaria there, and it was stopped. In Afghanistan troops were on it pretty much over the course of the long conflict, although over time we switched from mefloquine to doxycycline or Malarone because there was increased recognition of the neuropsychiatric side effects.

Having said that, there's only one suicide I know of that's directly attributable to mefloquine, Specialist Yuan Torrez in 2004, but the episode I'd like to close on is that of Staff Sergeant Bales. You may remember Staff Sergeant Bayles. In 2012 he went out from his sleeping quarters, went to two different villages, massacred 16 Afghani civilians, wounded a number of others, and burned their bodies. He was apparently dressed in a bizarre fashion and having visual hallucinations.

When I first heard of this, I thought instantly that this was a mefloquine reaction, especially with the delusional paranoid behaviour—and you will hear about this over and over—and the visual hallucinations. As it turned out, Staff Sergeant Bales was on mefloquine in Iraq. He had a traumatic brain injury so he should not have been on mefloquine. It is still unknown whether or not he was on mefloquine at the time of this incident. He was prescribed doxycycline. We know he didn't take it. He was in an area where mefloquine was used commonly by special forces soldiers back at that time. It's not used by the special forces anymore. They have completely stopped using it.

What's most troubling about this case, whether or not he was on mefloquine or steroids and alcohol, as he seems to have been, is you have the same themes I talked about in the beginning, a lack of informed consent, a lack of screening for TBI, and a lack of documentation.

● (1550)

The Army never said whether he was on it or not, and I believe they did not know.

What is totally clear is the political damage this did to the United States military in our relationship with the country of Afghanistan. I will make the argument that it is too dangerous to put our soldiers and marines, who are handling weapons, may be stressed from other sources, may have post-traumatic stress disorder or traumatic brain injury, and are often in field situations where it's hard to do a good medical assessment.... I would argue that no service member at this time should be placed on mefloquine. The potential for violence is too great.

I see that the screen has just gone dead, so I will conclude my remarks here. I believe Dr. Nevin will talk about the “black box” warning that has been placed on mefloquine, again recommending against using it because of the multiplicity of neuropsychiatric side effects, including paranoia, irritability, delusions, and visual hallucination, which lead to the conclusion that it has severe neurological toxicity.

Thank you very much for your attention.

The Chair: Thank you.

Next, we have Dr. Nevin.

Dr. Remington Nevin (As an Individual): Thank you very much, Mr. Chair. It is a great privilege to be invited to address the committee today to discuss the anti-malarial drug mefloquine.

I'm Dr. Remington Nevin. I'm a former U.S. Army preventive medicine physician. I received my medical training at the Uniformed Services University School of Medicine, and I've earned master's and doctoral degrees in public health from Johns Hopkins University. I completed residency training at the Walter Reed Army Institute of Research, and I'm currently completing a post-doctoral fellowship in occupational and environmental medicine at Johns Hopkins University.

I have 14 years of active U.S. medical service, including overseas tours in malaria-endemic areas in Africa and Afghanistan, where I had the honour of serving briefly alongside Canadian Forces personnel at Kandahar.

It was in Afghanistan where I first became interested in mefloquine, particularly in the adverse mental health effects of the drug. In the nearly decade since, I have authored or co-authored three dozen book chapters, letters, and peer-reviewed articles in various scientific and medical journals on the topic of malaria or anti-malarial drugs, including mefloquine to include, with Dr. Ritchie, what was the first review in the forensic psychiatric literature of the drug's affects.

I've received a $264,000 grant from the U.S. Army to study the genetic basis of susceptibility to mefloquine's adverse effects, and I've undertaken a number of other pharmacovigilance studies of the drug, including a detailed analysis of reported adverse event data that is pending publication. My doctoral thesis from Johns Hopkins is titled “Pharmacovigilance of Neuropsychiatric Adverse Reactions to Mefloquine”.

In recent years, my research in this area has broadly informed the rapidly changing military policies on the use of mefloquine, as well as a recent regulatory re-evaluation of the drug in the United States and in Europe. For instance, I offered evidence to the U.S. Food and Drug Administration prior to its directing the edition of a boxed warning to the approved mefloquine drug label in 2013. My work also directly informed the prohibition on the use of the drug among personnel of the U.S. Army special operations command later that year. I've previously offered evidence concerning mefloquine to committees of the U.S. Senate and the U.K. Parliament. I've also been retained or offered evidence in a number of civil and criminal cases on behalf of clients alleging adverse effects from the drug.

I should emphasize that I have not accepted sponsorship or received any funding from pharmaceutical companies for my work, and the opinions I offer today are my own and not necessarily those of my employer, Johns Hopkins University.

Mr. Chair, I would like to offer members of the committee, to begin, a brief review of what is now known of the drug's chronic adverse mental health effects, and then describe how in certain other countries, including the United States, growing awareness of these effects has recently been informing improved evaluation and care of veterans who may have been prescribed or otherwise have been issued mefloquine during their military service.

For many years it was believed, erroneously, that mefloquine had no long-term mental health effects. It was believed that, once the drug was fully cleared from one's system, any adverse mental healths would resolve. However, as drug regulators in both United States and Europe have specifically acknowledged, in some patients, the use of the drug is associated with a risk of mental health effects that can last for years after use and in some cases may even be permanent. The reasons for this are not yet fully understood, but it is known that unlike some other safer and better tolerated anti-malarial drugs, mefloquine is a neurotoxicant, meaning that as with lead or mercury, it is a substance that is capable of causing serious disruptions in the function of cells in the central nervous system and potentially causing permanent injury to these cells. More concisely, the intoxicating effects of mefloquine can cause an encephalopathy and then a neurotoxic injury to the brain.

In retrospect, it appears this property of mefloquine has been known for some time. For example, ever since the drug's licensing in the United States, over a quarter of a century ago, in 1989, the original drug manufacturer, Roche, has alluded to this potential warning on the drug labelling that if certain so-called “prodromal symptoms” developed during use of the drug, such as anxiety, depression, restlessness, or confusion, the drug should be immediately discontinued to reduce the risk of what was euphemistically referred to as “a more serious event”. In extreme cases, this more serious event was even acknowledged as encephalopathy, and often manifesting as a deep confusion, or delirium, or severe amnesia, along with certain other severe symptoms such as psychosis.

● (1555)

As the boxed warning in the United States and similar warnings in Europe now suggest, this same encephalopathy is also now understood to carry a risk of much subtler but still lasting, and perhaps even permanent, alterations in mood, personality, cognition, behaviour, and sleep, including symptoms of insomnia, nightmares, anxiety, depression, and personality change.

Particularly among returning veterans, these lasting symptoms may risk being misdiagnosed, including as the effects of traumatic brain injury or post-traumatic stress disorder. However, as recent drug labelling changes in the United States and Europe should now make clear, in many cases these symptoms may actually have nothing to do with combat exposures, but simply reflect nothing more than the toxic encephalopathic effects of the drug.

For example, in one recent study of Danish travellers who had previously reported adverse effects while using mefloquine, 21% of those reporting nightmares and 33% of those reporting cognitive dysfunction while taking the drug identified that these adverse reactions as still persisting over three years after use of the drug.

Unfortunately, in Canada, veterans, physicians, and even government officials may not be aware of this. Unlike in the United States and Europe, Health Canada has not yet directed an update to the mefloquine drug labelling to reflect this new knowledge. Perhaps as a result, the Minister of Veterans Affairs, the Honourable Kent Hehr, recently informed a Canadian veteran, quite incorrectly, that there are no long-term effects from taking mefloquine.

In contrast, in a growing number of other countries, including the United States and Australia, these long-term effects are at least reluctantly acknowledged. Steps are beginning to be taken to care for veterans who may have been affected by them. In the United States, the U.S. Army special operations command issued an order acknowledging that the effects of mefloquine "may confound the diagnosis of PTSD and TBI", and directed that commanders and medical personnel "address and assess the possibility and impact of mefloquine toxicity in their populations".

The U.S. Department of Veterans Affairs is taking steps to begin to study affected veterans, and recently awarded the first long-term disability claim for symptoms, in this case chronic sleep impairment and frequent panic attacks attributed to service-connected use of the drug.

This year, legislation was introduced in the U.S. Congress to expand the mission of various centres, including the Center for Deployment Health Research, and the Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury, so as to include the clinical evaluation, diagnosis, management, and epidemiological study of adverse health effects among U.S. veterans following exposure to mefloquine.

In Australia, their Repatriation Medical Authority, or RMA, has recognized a number of conditions as being potentially caused by mefloquine and for which disability benefits may be awarded. These include primarily lasting neurological disorders associated with use of the drug, but also certain psychiatric disorders, including depressive disorder and bipolar disorder. RMA is reviewing the role of mefloquine in anxiety disorder, panic disorder, and suicide and attempted suicide as well.

It is on this issue of suicide that I will conclude my prepared remarks.

Today we recognize that symptoms of severe encephalopathy that can occur most commonly during use of the drug may also carry a strong risk of suicidal ideation, completed suicide, and, in some cases, a risk of extreme aggression and even violence directed towards others. We are also beginning to recognize the role of this toxic encephalopathy in affecting the risk of suicide even many years after use. Almost all suicides need to be understood in a broader context of mental illness. As mefloquine increases the risk of lasting symptoms of mental illness, and as symptoms of mental illness are strongly associated with suicide, it should not be surprising that veterans who have been prescribed the drug appear to be at significantly increased risk of suicide.

However, we must also acknowledge how the potential mistreatment of mefloquine veterans may be further contributing to this risk. Although we know that some mefloquine veterans may be receiving care for their symptoms under a diagnosis of TBI or PTSD, we also know that many other veterans, including those without traumatic exposures or who had never suffered a concussion, and in whom these lasting symptoms may not be easily explained, have been accused of malingering, of having a personality disorder, or have been told it's all in their heads.

In some cases, these veterans have been discharged without medical benefits and left to fend for themselves. It should not be surprising to learn that some of these mefloquine veterans, mentally injured and cast out by the military that unwittingly poisoned them, would later take their own lives in desperation.

● (1600)

We have seen this, unfortunately, even in countries such as Australia and the United States where steps have been taken to recognize and acknowledge the problem. More needs to be done, and quickly, to acknowledge and better understand the lasting effects of the drug and how these effects may be treated, and to ensure that no veteran affected by these effects continues to suffer alone and without the care that they, through their service, rightly deserve.

That concludes my prepared statement and I would be pleased to take questions from members of the committee.

The Chair: Thank you.

Dr. Passey.

Dr. Donald Passey (Psychiatrist, As an Individual): Good afternoon, ladies and gentlemen, and my fellow veterans. I greatly appreciate the opportunity to be able to speak to this committee.

To start off with, I'm going to just take you through a 40-year journey that I've been on since 1976 when I first entered into medical practice, eventually joining the Canadian Forces.

I started doing assessments and treatments for PTSD in 1993, and this was after research that I had done in 1992-1994 on one CER, 1 Combat Engineer Regiment; the 2nd Battalion of the Royal Canadian Regiment; and the 2nd Battalion of the Princess Patricia's Canadian Light Infantry that were deployed to the former Yugoslavia. At that time we basically found that about 15% of our UN peacekeeping troops coming home were showing signs of post-traumatic stress disorder.

Over the course of my career, I've managed to assess and treat veterans, as well as serving members, from World War I, World War II, Korea, Vietnam, Cambodia, Central America, Haiti, the former Yugoslavia, with Srebrenica, the Medak pocket, Sarajevo, Cyprus, the Golan Heights, etc., up to and including Afghanistan and both Gulf wars.

In 1993, as a result of my initial research, I had recommended to the Canadian military that we develop multidisciplinary mental health clinics at the brigade level to deal with the predicted significant increase in mental health casualties. General Dallaire's advocacy and support in the late 1990s resulted in the creation of the operational and trauma stress support centres in the Canadian Forces at the major bases across Canada. Eventually, this evolved into the Veterans Affairs-funded operational stress injury clinics.

I was part of a mental health team that deployed to Rwanda in the latter part of the summer of 1994. We were sent there as a result of my initial research with the Yugoslavian veterans, with the prediction that in Rwanda we'd have increased casualty rates.

It was interesting that while we were there, the rates of things like PTSD and depression were next to zero. There were, however, a lot of symptoms—and it was like, and was called, Nightmare Friday—like very serious and vivid dreams every Friday when we were taking the mefloquine. I originally deployed with the expectation that we would follow up on these troops at six months and a year later, but the Canadian military decided not to do that. This is unfortunate because there were medical personnel who had deployed on that tour who I knew personally who ended up committing suicide in subsequent years. My assumption was always that it was PTSD because I, like everyone else at that time, did not feel that mefloquine would be a problem once it was stopped.

I witnessed first-hand members of the mental health team I deployed with become paranoid, isolative, and inappropriately threatening, while taking mefloquine, to the point that one of the members pulled out a knife beside me at a team meeting and was playing with it in a threatening manner.

After our team redeployed home, a Canadian Airborne Regiment member, Corporal Scott Fraser Smith, committed suicide by a C-7 gunshot at the Kigali Stadium in Rwanda on December 25, 1994. An investigation into this suicide never really determined what caused it. Was it PTSD from his Gulf deployment, his deployment to Somalia and Rwanda and the expectation that the unit was to deploy to Croatia after in 1995? Was it the mefloquine? Was it a combination? Was it that combination in addition to the alcohol, because we were allowed to drink back then? Were there other stressful situations going on? We don't know.

In 1996, January I believe, I forwarded a letter to the committee members. I wrote a letter to the Somalia Inquiry wishing to testify and inform the inquiry, as well as members of government and the Canadian Forces medical system, about the effects of mefloquine, and my thoughts that it was affecting the Canadian Airborne Regiment members and their behaviour in Somalia, up to and including the death of Shidane Arone.

● (1605)

It was interesting because at that time, prior to my going to testify, my commanding officer came into my office and actually was giving me crap, saying that I shouldn't have volunteered to testify and that the Surgeon General at that time, General Wendy Clay, was quite upset that I had volunteered.

It was very interesting that approximately one week before my testimony the inquiry was shut down. At that time, in 1996, neither the government nor the Canadian Forces ever had an opportunity to look at this and do something about it.

I also forwarded a letter from 1998 to the committee, which I wrote through my chain of command, expressing my concern about the Canadian Airborne health issues. I requested a medical follow-up of all members of that unit, but it was never acknowledged and never attempted.

The lack of support from the government and the Canadian Forces, and the way the Canadian Airborne was treated upon their homecoming and their regiment's subsequent disbandment, guaranteed that there would be medical casualties up to and including suicides.

I want to change direction here just briefly. I'm not an expert on mefloquine. My area is PTSD, but I want to talk a little bit about brain disorders.

There is a great overlap between post-traumatic stress disorder; other anxiety disorders; major depressive disorders; mefloquine, both long-term and short-term; and traumatic brain injuries. We don't know exactly what is happening. We do not know the electrical physiology, and we do not know the physiology of what is happening. What we do know, with more modern techniques like the quantitative EEG analysis, which gives a three-dimensional electrical view of the brain, and functional MRIs, is what areas of the brain are affected.

The problem is that it would be like your saying you have chest pain and therefore I am going to diagnose you with chest pain. Well, there are a whole lot of things that cause chest pain.

In the brain, where we are right now is where medicine was with the rest of the body a century ago. We're just starting to have the technology to move forward so that we're more accurately able to diagnose. The DSM-IV and DSM-5, which psychiatrists use, is a descriptor. It does not give you the actual pathology. Like any descriptor, it can encompass a whole lot of things.

We have soldiers coming forward suicidal, with bad dreams, irritability, aggressiveness, and anxiety. That can be any number of diagnoses. There is a huge overlap.

I want to mention our current treatment techniques. Pharmacotherapy as well as the talking therapies have significant failure rates. There is nothing that treats any of these disorders to a large extent beyond about 60% success.

Dr. Mark Gordon is an interventionist endocrinologist who specializes in traumatic brain injuries as well as PTSD, and he is looking at blood chemistry and hormonal and neural steroidal abnormalities. For instance, we now know there are certain metabolic pathways that are abnormal as a result of TBI, PTSD, and, I think, chemicals such as mefloquine.

Dr. Marty Hinz is another gentleman in the U.S. who is using transmitter precursors rather than antidepressants. It's interesting because antidepressants long-term can actually deplete neurotransmitters, and when you try to take someone off an antidepressant, all their symptoms come back.

For just another moment, if you can bear with me, I want to talk about the unknown fallen. These are our military members who return to Canada, retire, or are medically released and then eventually die from their medical disorder, whether it's a physical or brain disorder, or by suicide months or years later. They are often unnoticed, not acknowledged, and frequently alone. They receive no mention in the Hall of Honour, yet they served their country and ultimately died as a result of their service.

● (1610)

Briefly with regard to suicidality, suicide certainly increases with a diagnosis such as PTSD; 49% will think about suicide. Mood disorders, TBI, mefloquine, complicated diagnosis, PTSD, TBI, chronic pain, alcohol: I don't see very simple cases. Most importantly there's a perceived lack of support whether that's at the military unit, the government unit, or with Veterans Affairs. Denial of claims has a huge impact and increases suicidal risk in veterans. I can spend the better part of an hour giving you examples of the denials and subsequent suicides that I've been aware of.

I'm aware of the time. I've forwarded a copy of this to the members of the committee, and I'd be happy to discuss any of the issues I've listed.

Thank you.

The Chair: That's great, thank you. And to all the witnesses today, if you do submit things to the clerk after your committee time, the clerk will get it to all committee members.

We'll start off with the first round of questions.

Ms. Wagantall.

● (1615)

Mrs. Cathay Wagantall (Yorkton—Melville, CPC): Thank you very much.

One of the things I need to say right off the top is that it's disgusting the amount of time we have to ask you a question, so if all of you could answer my questions as briefly as possible, we can have answers to as many as we can.

I'm hearing that the symptoms of mefloquine can be mistaken or disguised as PTSD and others. How do you distinguish symptoms of these conditions from those due to mefloquine?

Dr. Remington Nevin: I'll speak briefly, and then I'll defer to my colleagues who are psychiatrists.

We have written about how the symptoms caused by mefloquine can in some cases be confused with post-traumatic stress disorder. I think that during brief diagnosis, brief encounters, if a clinician is not thoroughly familiar with the many symptoms caused by mefloquine, it may be tempting to assign certain combinations of symptoms caused by the drug to PTSD. But I think, as Dr. Ritchie may be able to elaborate on in more detail, certain symptoms are not associated with post-traumatic stress disorder. For example, dizziness caused by mefloquine is unlikely to be explained by post-traumatic stress disorder. Amnesia, extreme severe dissociation and psychosis are symptoms commonly caused by mefloquine in certain circumstances but are not associated with post-traumatic stress disorder.

In my experience reviewing a number of cases, I feel confident that I can distinguish the symptoms of mefloquine toxicity from other psychiatric disorders, based on my knowledge of psychiatric epidemiology. But I do think more research is necessary, and I think we need to educate psychiatrists about this condition so they can incorporate this into their practice. I'll defer to the others to add more.

The Chair: Dr. Ritchie.

Dr. Elspeth Ritchie: The most important thing is to have a high index of suspicion that somebody may have been exposed to mefloquine and then to ask the person if they had been on an anti-malarial, was it a daily dose, Malarone or doxycycline, or a weekly medication. Soldiers and other service members know that if it's weekly, it's mefloquine. And then as a result of that, there is an overlap in symptoms but some we think are unique to mefloquine. Those are the effects of damage to the vestibular part of the brain, that's the brain stem, so that's a dizziness, nystagmus, your eyes fluctuate back and forth, and then looking at all the other symptoms as well.

We are now beginning a study at the veterans administration where we are trying to categorize the symptoms, and we're hoping to find what's called pathognomonic symptoms and others that are unique to mefloquine. We're not there yet, but we think that we may find a combination of neurological and psychological problems. Of course, they're not mutually exclusive, and that's part of the challenge. You've served in Somalia, you've served in Afghanistan, you've been exposed to the blast of combat, so you may have TBI and PTSD.

It can be a tremendous relief to the service member to be asked about their exposure. Often they're concerned about it; they feel nobody takes it seriously. Simply to hear that story and say, yes, we think mefloquine could have been related—

Very quickly, the problem is we don't know how to treat it yet, and that's an area of research we need to have. If you have these symptoms, what is the best treatment?

Mrs. Cathay Wagantall: Thank you.

Dr. Donald Passey: If I could just add to that, yes, the diagnostic part is important, particularly for individuals, when they think they're going crazy, and Veterans Affairs requires a diagnosis. It's important in that regard, but there is a great deal of overlap.

The important piece we need to focus on is how we are going to treat this. How are we going to treat PTSD, traumatic brain injury, mefloquine? What techniques can we use? Our current treatment strategies are not good enough. Our current ability to evaluate what's going on in the brain is not good enough. We need to move forward with these technologies, and then we may be able to come up with some treatment strategies. It may actually help separate out the disorders.

● (1620)

Mrs. Cathay Wagantall: My next question is this. If I understand correctly, mefloquine is still an option for our Armed Forces, given the choice. It's something that you take daily or weekly. I'm not sure if that screening and documentation is taking place now, but in light of what we're learning even today and what you've discovered over the last quarter-century, should Canada consider reopening the Somalia commission of inquiry with these previously unresolved questions?

Dr. Passey, do you want to start?

Dr. Donald Passey: I think when any soldier's behaviour appears aberrant, we need to understand what's going on with that. We have highly trained individuals in the Canadian Forces who are basically trained to apply lethal force. We need to understand what's going on. Yes, PTSD can be an issue, but I wouldn't have raised those concerns back in 1996 and again in 1998 if I did not think they were valid and we needed to attempt to address them.

I'm out of the military. I was medically released in 2000, so I'm not sure what we're doing. But I can tell you that back in 1993 the only thing we were warned about is that we would get vivid dreams. There were no warnings about long-term consequences to mefloquine usage.

Mrs. Cathay Wagantall: Thank you.

Go ahead, Dr. Nevin.

The Chair: You'll just have to make your answer short on this next one, please.

Dr. Remington Nevin: You had two questions: whether mefloquine should continue to be used by militaries, the Canadian Forces in particular; and the other was about the Somalia commission of inquiry.

I do not recommend that militaries use mefloquine. I am on record as saying I do not think it should be used. I will reluctantly accept its being offered as a drug of last resort when individuals can't take the other drugs, but then it has to be used very carefully. I describe that more in some of my published works.

The Somalia commission of inquiry really revolved around the central issue of the effects of unusual behaviour. The commission was terminated before the plausible effects of mefloquine in contributing to that unusual behaviour were fully investigated. I think we know now much more about those effects than we did even at the time. So there could be some utility to reopening the investigation, in light of our new understanding of the dangers of the drug and also what has subsequently been learned about the inappropriate use of mefloquine as an experimental drug during the early months of that mission.

The Chair: Thank you.

Dr. Elspeth Ritchie: May I respond?

The Chair: Yes, if you could do it in 10 or 20 seconds.

Dr. Elspeth Ritchie: Yes. In the past, one reason we used mefloquine was because of cost issues, and also it was believed that people would be more compliant with a once-weekly dosage. However, the cost is little compared to the cost of lives or things like massacres. In terms of compliance, what we find is that people are less compliant with mefloquine because they've heard about it and the scary side effects, so they don't take it and are more likely to develop malaria.

The Chair: Thank you.

Go ahead, Mr. Eyolfson.

Mr. Doug Eyolfson (Charleswood—St. James—Assiniboia—Headingley, Lib.): Thank you very much, everyone, for coming.

The first question I have is this. There are other anti-malarial drugs. Has there been any association with these neuropsychiatric symptoms with any of the other ones, or is this unique to mefloquine?

Dr. Remington Nevin: I'd like to address that question. That is the subject of some of my recent research with Dr. Croft, a military colleague from the U.K. Mefloquine is a member of a class of drugs known as quinolines. In fact, it's not the first quinoline that militaries have used that has had these effects. We have to go back to World War II to see the first widespread use of a synthetic quinoline drug, atebrin, or quinacrine. I believe it's marketed as mepacrine here and in the U.K. It was associated with similar reports of confusional associative psychosis, anxiety, and panic attacks. At the time, there was some evidence that it was associated with chronic effects, as well.

A number of experimental drugs that were developed by the U.S. military during World War II to replace atabrine also had similar effects. There's good reason to believe that chloroquine, the mainstay quinoline derivative drug used throughout much of the last century, also shares these properties to some extent.

I've been exploring the unusual and quite novel hypothesis that some of what we have attributed to combat stress throughout the years may actually be due to the lasting effects of various quinoline drugs, not just mefloquine, but going back to World War II.

There are safer classes of drugs today. The anti-malarial drugs that are available now for use on a daily basis do not share the neurotoxic, intoxicating, encephalopathic effects of the quinoline drugs. There are some mild side effects reported with the use of these drugs, but unlike mefloquine, these side effects do not require the immediate discontinuation of the drug in order to prevent potentially permanent adverse effects.

● (1625)

Mr. Doug Eyolfson: All right, thank you.

With regard to the currently used drugs, doxycycline and Malarone, in your estimation, is there any question about their effectiveness as an anti-malarial, other than the question of whether or not soldiers will comply because the drugs are daily?

Dr. Remington Nevin: Absolutely not. Both doxycycline and Malarone are as effective, if not more effective, than mefloquine. There's no area in the world that we send troops to where those drugs are not effective. In contrast, a large part of the world demonstrates some resistance to mefloquine.

As for questions about whether soldiers will be as compliant with a daily dose versus a weekly dose, these issues have long since been settled. When the U.S. military shifted from mefloquine as its preferred drug to doxycycline, and later to Malarone in 2009, we saw rates of malaria decline precipitously. As Dr. Ritchie alluded to before, this was because soldiers are, in general, compliant with their doxycycline and Malarone. With mefloquine, on the other hand, based on the guidance in the product insert, we should expect somewhere around a third of soldiers taking mefloquine to discontinue the drug in accordance with the product insert guidance. It's simply not a practical drug to use if soldiers are permitted to discontinue it in accordance with the label; they'll do it themselves and simply not tell their commander.

The U.S. military probably presents the best anecdotal example of the differential effectiveness of these drugs. In 2003, we deployed a few hundred marines on shore to Liberia for a humanitarian mission. Within a few weeks, the mission was scuttled. Dozens were evacuated with suspected malaria. They were all taking mefloquine, or supposedly taking mefloquine. Contrast that disastrous experience with mefloquine with our recent, very successful operations in Liberia. Thousands of personnel spent months in the very same malaria-endemic area, but they were taking the much safer daily drugs, doxycycline and Malarone. There were zero cases of malaria. I think that is sufficient evidence.

Mr. Doug Eyolfson: All right, thank you.

I throw this open to all of the panellists. Now we're talking about different types of studies. Of course, with your levels of evidence, there's no way you can form the gold standard of the randomized clinical trial with such a thing. In regard to the associations, when you're looking at the types of research going on, what are the sample sizes of people involved? How many military personnel are involved? How many were deployed? How many were on Malarone? What kind of sample sizes are we talking about in the studies?

Dr. Elspeth Ritchie: Maybe I could take that question.

First of all, there is absolutely minimal research done, so we can't tell you the sample sizes. A lot of the research that was done initially was rat research. By the way, it was done on male rats, so if we talk about female service members—which is a whole different discussion about effects on pregnancy and reproduction—we have no information.

At this point, it is not ethical to do a perspective study, because we know mefloquine has serious neuropsychiatric side effects. What we are beginning to do at the VA in Washington, DC, in what's called WRIISC, the war related illness and injury study center, is look at people who say they've been exposed to mefloquine and try to characterize their symptoms. At the moment, we have 51 people who have self-identified.

If you start expanding this—I think this has been part of Dr. Nevin's experience, and it is part of my experience, too—you would very quickly get many service members who come in and say, “I have some symptoms. Study me.” That's probably a reasonable first step for our northern neighbours, to look systematically at the people who come in.

Often these people feel like they've been blown off by the military and nobody has taken them seriously. Just to be studied.... We can tell you a little more about how we do it and which studies, whether it's an MRI, a PET scan, vestibular testing—which is one of the things we are starting with—neuropsychological testing, or looking at effects on reproduction. That's a growing science. That's where I would begin—look at the sailors, soldiers, and airmen you have now and see what their symptoms are.

● (1630)

The Chair: Ms. Jolibois, go ahead.

Ms. Georgina Jolibois (Desnethé—Missinippi—Churchill River, NDP): You talked about the lack of treatment plan available. Do you foresee what that would look like?

Dr. Donald Passey: As I've already mentioned, we have standard pharmacotherapy. Most of the medications we use for PTSD are not actually recommended for PTSD in regard to things like sleep, curtailment of irritability, etc.

We know that pharmacology, by itself, is not the answer. The talking therapies, similarly.... Even in good studies, you don't get much above about 60% success rate, and there is always the relapse down the line.

The reality is that we need to engage in looking at new types of treatment. I've mentioned two individuals who are going in that direction, Dr. Mark Gordon and Dr. Marty Hinz. They are looking at a totally different direction, utilizing blood analysis and urine analysis in an attempt to determine which metabolic pathways are actually abnormal in these types of disorders.

Dr. Elspeth Ritchie: I'll add to that. One of the real challenges is knowing how to treat it.

Unfortunately, mefloquine is still used in the Peace Corps. I've had the unfortunate luxury of seeing a number of returning Peace Corps volunteers, who sometimes have been medevaced out with psychosis. The question is, do you treat them with an antipsychotic agent, or is that contraindicated? I've also seen people whose symptoms have lasted for some years, depression and anxiety, but we don't know.

I totally agree with Dr. Passey that more treatments are needed. By the way, we realize we have never met until today.

The direction I have been going, in general, for post-traumatic stress disorder is complementary with alternative medicines, integrated medicine, yoga, meditation, and exercise. I recommend exercise to all my patients with post-traumatic stress disorder. I would like to explore how helpful these treatments may be for people with mefloquine-induced toxicity. My hypothesis is that they would help calm down the jangle that you see with people on mefloquine.

I have a couple of other points, briefly. There are some accommodations that can be used, things like sunglasses—there is a lot of photosensitivity. A cane can be used for accommodation. Finally, again, what I have found so helpful is when service members or their spouses.... It's often the spouse who is reaching out and saying, “Ah, this is it. He was okay until he went to West Africa or Afghanistan”, and this is an explanation that makes sense.

Dr. Remington Nevin: I'll emphasize Dr. Ritchie's previous comment. In my experience speaking with a number of veterans who have discovered that mefloquine could be the cause of their symptoms, there's an extraordinary amount of relief that I believe has real therapeutic value to learning what the cause of their symptoms is.

They come home from taking mefloquine, with their personalities in many cases fundamentally altered. They can't make sense of why they feel the way they do and why they are suddenly burdened with these many problems. To learn that it isn't a psychiatric disorder, but that it's in essence a poisoning can be very therapeutic.

We are working to try to reduce the stigma associated with psychiatric diagnoses. But for many soldiers, to know that it's not actually a psychiatric diagnosis, that they're not weak, that there's no character flaw underlying their symptoms, that it's the effect of a poison, this is extraordinarily therapeutic for many of them.

We should continue to combat stigma, but we do need to acknowledge that this is therapeutic for many soldiers to learn.

● (1635)

Ms. Georgina Jolibois: I'm curious. Currently when service members deploy to those countries or they go and visit, are there other drugs that they're on besides this medication? Do you know?

Dr. Remington Nevin: I cannot speak to practices in the Canadian Forces. Perhaps Dr. Passey can. I can speak to my knowledge of practices in the U.S. military. In fact, some of my early research focused on this very point. The work I did while in Afghanistan determined that a sizeable fraction of our force was taking psychotropic medications: antidepressants, anti-anxiety drugs, and in some cases even anti-psychotic drugs that had been prescribed to them for prevalent mental disorders.

In many cases the soldiers were not disclosing that they were taking these drugs when they were being evaluated for which anti-malarial drug to use while deploying overseas.

As a result, my research showed that one in seven service members with some contraindicating condition, such as the use of a psychiatric drug, were nonetheless prescribed mefloquine. Certainly the U.S. experience is that there has been, at least historically, a high risk of co-prescribing mefloquine with psychotropic medications. I would imagine that's similar in other countries.

Dr. Donald Passey: Very briefly, I can't speak now...because I'm not in the military, but certainly during my time I treated individuals with PTSD, a major depression. For instance, I put them on antidepressants, got them to a point where they were deployable; and so they did deploy overseas on psychiatric medications, but you have to screen those individuals very carefully. I'm not aware of whether or not that was ever looked at in regard to actually prescribing mefloquine.

Ms. Georgina Jolibois: Okay.

Dr. Elspeth Ritchie: If I may add—

The Chair: You'll have to make it quick.

Dr. Elspeth Ritchie: —I took your question to refer to local drugs of abuse and we do see opiates in combat areas or Afghanistan. We see methamphetamines mailed over there. In Somalia it was khat.

We don't know a lot about the interaction with drugs of abuse and mefloquine, but based on what we do know we would expect their effects on the liver, the effects on the kidney, the effects on the brain probably have a synergistic, negative effect on the brain.

Sergeant Bales apparently was on steroids and alcohol, and my hypothesis is whether his use of mefloquine was recent or chronic or long term. We know he was on it. It's that those drugs affected his already impaired brain in a very dangerous way.

The Chair: Thank you.

Mrs. Lockhart.

Mrs. Alaina Lockhart (Fundy Royal, Lib.): Thank you all for your insight into this drug. From what I hear you saying, it points an awful lot to the difficulty in disseminating all of these factors to try to determine what the core issue is, but it's some very compelling evidence that you've said today.

One of the things that Dr. Nevin said was that veterans are finding comfort, for lack of a better word, in being diagnosed with an injury versus this vague term of mental illness. I think as we move forward and study mental illness more in depth and are able to provide physical reasons, it will be helpful to veterans.

I have a few specific questions about the drug. First of all, I wanted to know whether there other drugs that may not be prescribed for malaria that have a similar impact as mefloquine. Is there any other drug that we can draw a parallel to that we see having these neurological impacts?

Dr. Remington Nevin: I'll speak briefly, and then I think I'll defer to my colleagues in psychiatry, who are perhaps much more familiar with other classes of drug.

I mentioned earlier that it's this entire class of synthetic quinoline drugs, including mefloquine, I suspect chloroquine, certainly atebrin or mepacrine during World War II, and possibly even quinine—which we all have enjoyed at some point in our tonic water—that may have this propensity because of a class effect.

I have written in a few manuscripts that the effects of mefloquine intoxication or encephalopathy do resemble that seen in extreme cases with certain other drugs, including some recreational drugs. One thing I will point out is that the particular combination of symptoms and neurological injury caused by this class of drug, I do feel, is unique. The quinolines were discovered in World War II to cause this absolutely fascinating pattern of microscopic, cell-specific injury to various centres in the brain stem and deep brain, in the limbic system—extraordinary, as described by the authors of that time. To my knowledge, this finding really hasn't been replicated in any other class of drug.

So while some of the effects—I think the psychosis, the memory loss, the changes in behaviour—are certainly shared by a number of other intoxicants, the combination of psychiatric and neurological effects, I do think, is unique to this class.

● (1640)

Mrs. Alaina Lockhart: This may seem completely off, but I know there are a few drugs that help people to stop smoking, for example, and I've heard anecdotal stories about their having a long-term impact.

Would that be similar at all?

Dr. Remington Nevin: I'll defer to my colleagues in psychiatry for that question.

The Chair: Go ahead, Dr. Ritchie.

Dr. Elspeth Ritchie: The medication that you're referring to, Chantix, has been associated with a lot of neuropsychiatric side effects; another one, Zyban, or Wellbutrin, much less so. I don't prescribe Chantix to my psychiatric patients because they're coming to me because they have suicidal thoughts and ideation.

Going back to your other question, are there other medications that have this many side effects, if you look at the medications that are the top 10 in side effects, and neuropsychiatric side effects, just about all of them are psychotropic drugs, they are antipsychotic medications or antidepressant medications or medications for bipolar disorder or seizures, which are often the same. So mefloquine is up there. I think if we had any other medication that caused this many side effects, it would have been pulled from the market a long time ago.

One historical piece that we did not mention is that mefloquine, which was developed by the Army and Hoffmann-Laroche, did not have post-marketing surveillance, by that I mean after it was put on the market nobody was gathering the side effects, unlike other medications that were done in a more conventional way. That is part of the problem here, and Dr. Nevin can elaborate on that.

One other piece I wanted to mention that I think is very important is we've briefly said this drug causes toxicity in the brain stem and in the limbic system. We see that when we look at rats and chop off their heads and look at their slices. They have vacuoles, places where the mefloquine has poisoned the brain stem, and the brain stem is what causes your balance. The problem with it is the dizziness, the nystagmus. Dr. Nevin mentioned the limbic system. The limbic system is where our emotions are, that lead to the amygdala, which is affected by post-traumatic stress disorder. The hypothesis—again, not proven—is that these changes to the limbic system are what leads to this intense aggressiveness and anger, and that's what I think makes this medication so dangerous.

Why do some people react to it and some not? It could be genetics. A theory of mine is that in Somalia it was very hard to get hydrated, to get enough water. That was a very primitive environment. I remember the truckloads of water that we'd all be scrounging for. It was hot and people didn't drink enough. I think the damage to the veterans in Somalia was greater than, say, to those in Iraq or Afghanistan, where there was a mature theatre and people got more water. Again, that's a hypothesis. Another piece is that some people have changes in the blood-brain barrier. They metabolize agents more. It is clear that while some people are severely affected, others are not affected at all, and that's led to some of the questions of, this is just an hysterical reaction on the part of the journalist, because I took mefloquine and I was okay. I did take mefloquine and I was okay, but I was also in a medical unit, so could get water. I'd be curious about Claude's experience, whether he was able to stay hydrated. Similarly with the Canadian Airborne Regiment, I believe they were in primitive conditions.

Finally, what I often see with mefloquine is it's the straw that breaks the camel's back. You're in nasty, difficult circumstances, you are irritable, the food sucks, the water sucks, there's not a place that you can go, excuse my language, and take a dump so you're irritated about that, your wife is going to leave you. But then you have this pill on top of that that just revs up your rage, and you hear it over and over again, and you have these crazy bad dreams, these vivid dreams, nightmares, and you just snap.

● (1645)

The Chair: Thank you.

Mr. Rioux.

[*Translation*]

Mr. Jean Rioux (Saint-Jean, Lib.): Thank you, Mr. Chair.

I want to thank the witnesses for participating in this committee meeting.

Apparently mefloquine, marketed by the F. Hoffmann-La Roche AG pharmaceutical company under the name Lariam, stopped being available in Canada in 2013. However, the generic drug is still available.

First, can you explain why the brand name drug was withdrawn and not the generic drug?

Second, were comparative studies of mefloquine carried out with civilians?

I'll leave the question open. I think Mr. Nevin has some answers.

[*English*]

Dr. Remington Nevin: Yes, thank you.

I can address that question, as it relates to Canada as well as to some other jurisdictions. To my knowledge, Roche stopped manufacturing, or distributing, or marketing its brand, Lariam, some time in the past few years. It was this decade, anyway. This is coincident with a trend of Lariam being discontinued in a number of other markets. Roche discontinued the sale of Lariam in the United States, I believe, in 2009. It recently discontinued the sale of the drug in Ireland and in a number of other European countries.

It is decidedly unusual for a drug company to discontinue the sale of a drug that has such good name recognition. The marketing value of the brand name typically means that the drug will remain profitable, even up against possibly lower-priced generics. There's widespread speculation that the decision by Roche to cease the marketing of Lariam in the United States, Canada, and other jurisdictions was arrived at for legal reasons, for concerns of legal exposure due to a potential for lawsuits related to the drug's use.

The company claims that it was a commercial decision based on declining sales. That's certainly the case. In the United States, generic mefloquine remains available—and it is available for sale independently of concerns about legal liability. By a Supreme Court decision, generic drug manufacturers in the United States cannot be sued for deficits in the product labelling or for a failure to warn. I don't know enough about the legal systems in other jurisdictions, including Canada, to know if similar motivation informs the continued sale of mefloquine here.

I hope that addresses your question.

Mr. Jean Rioux: Yes.

[*Translation*]

Were there similar cases in the civilian world? We know that civilians experienced adverse effects after taking mefloquine.

[*English*]

Dr. Remington Nevin: Yes, I can address the question of whether civilians have also been affected by mefloquine. I should point out that I believe this issue attracts a lot of attention. The issue of adverse health effects among veterans attracts the most attention because this is a large group of persons, a large population that is given the drug at one time, and so perhaps problems with the drug will be more apparent within groups of military veterans. For example, in the United States we have been using mefloquine for quite some time on our Peace Corps volunteers, who are civilians. This is increasingly an area of concern and controversy. It's the subject of significant media attention at the moment in the United States. Of course, we would expect civilians to be as susceptible as military personnel to these adverse effects.

One thing I will say—and I think it's important to understanding why our veterans may have been more affected than other persons—is to keep in mind the product insert. The manufacturer's directions explicitly state that you must discontinue the drug at the onset of certain symptoms: anxiety, depression, restlessness, or confusion. This has been the advice given to Canadians, I believe, since the drug was first marketed. Today that advice is even more strict: if you experience any psychiatric symptom, you must immediately discontinue the drug. This is recommended in order to avoid these more serious effects.

Travellers on vacation would certainly abide by that advice if it were given to them, but soldiers often don't have that luxury. Soldiers may have been experiencing all of those symptoms and more, and may have been told to continue taking the drug. That is why I think we've seen many more serious side effects in military populations than among civilian travellers, because they were in essence ordered to take the drug, contrary to the product insert guidance.

I hope that addresses the question. Civilians may simply stop taking the drug, but military personnel are in many cases ordered to, and that increases the risk of these more serious effects.

● (1650)

Dr. Elspeth Ritchie: If I may briefly add to that, another population that has taken the medication is journalists, because they have often gone and followed the military. We don't have a good study there, but many journalists I talked to said they took it the first time but would never take it again. They didn't have to take it, or they went to a travel medicine clinic that told them to stay away from it, or they could afford the more expensive Malarone.

One challenge is that if you're at a small pharmacy, for example at Fort Polk, and you have 1,200 soldiers who are deploying, and you have a choice between Malarone, which costs $3 a pill, and mefloquine, which costs 30¢ or so for a week, and you're giving six months' supply to those 1,200 soldiers, choosing Malarone would add a significant cost to your budget.

The Chair: Thank you.

Mr. Brassard.

Mr. John Brassard (Barrie—Innisfil, CPC): Thank you, Mr. Chair.

I do have a specific question for all three of you, but I want to pick up on something that Dr. Nevin just said, and it's to you, Dr. Passey. We all know that the job of a soldier is to follow orders, and if the orders are to take this pill, they would follow that order. What were the consequences to the soldiers, in your experience, who didn't take the pill as ordered?

Dr. Donald Passey: We follow orders, you know? The mission comes before life and limb. It's very simple. That's what we're trained to do. In a deployment, the idea of not following orders is basically unthinkable and chargeable.

I believe there was—and I don't remember this gentleman's name—a military member who refused to have his vaccination before deploying, and he was court-martialled. I don't know the outcome of that. But if you're in a combat zone, it's not optional.

Mr. John Brassard: So these soldiers had no choice?

Dr. Donald Passey: As far as I'm aware, no.

Particularly, a lot of the units—you have to realize—get down to platoon size, etc. You may not necessarily have any medical staff there at all, or the medics may not necessarily be aware of all the potential consequences of this type of medication. As I mentioned, I was a senior medical officer when I was deployed to Rwanda, and I didn't know. They told us about the dreams, that was it. We had no other information. Take the pill. Friday, take your pill.

Mr. John Brassard: It has been a fascinating discussion today.

I'm going to ask all three of you to weigh in on this. I know we don't have much time, but in terms of recommending to the Canadian government or Veterans Affairs how to deal with this, Dr. Nevin, what would be your suggestion? I know, Dr. Ritchie, you touched on this briefly.

I would also ask this as well. We're dealing with this as the veterans affairs committee. Is this the kind of issue, for example, that Health Canada should be looking into, given the fact that there are some civilians who are still dealing with this? And, of course, there's the impact that it has had on the military.

I'll open it up to any one of the three of you.

Dr. Remington Nevin: I will address that question, Mr. Chair.

I recently published an analysis of drug safety labelling in six countries, including Canada, the United States, some European nations, New Zealand, and Australia. What's very clear from that analysis is that, of these developed western nations, the drug label for mefloquine here in Canada is far behind. It's quite out of date. I do believe, as we discussed in the manuscript, that Canadian travellers are being put at some risk for not receiving the same up-to-date directions that travellers from other countries received.

I don't know the reasons for the delay in updating the Canadian mefloquine drug label to reflect our new knowledge of the permanent effects of these drugs and also to reflect the stronger guidance that the drug be immediately discontinued at the onset of any neuropsychiatric symptom. Most drug regulators will reluctantly concede that most drug labels are actually out of date, but I think that our experience with mefloquine should reinforce the need to pay close attention to the accuracy and completeness of the information on that label.

The fact that the Canadian mefloquine drug label is somewhat out of date might explain the Department of National Defence's continued use or support of the drug. Perhaps if the drug label was updated to reflect our current understanding, Canadian policies for use of the drug would begin to reflect those of other western nations. I would certainly recommend that Health Canada examine —independently, of course—the evidence base.

● (1655)

The Chair: Dr. Ritchie.

Dr. Elspeth Ritchie: This is my recommendation; stop mefloquine use completely. I disagree with Dr. Nevin. I don't think it should be used as a drug of last resort. I don't think it should be used at all. If somebody can't tolerate mefloquine, don't send them to a malarious area, send them to Antarctica. You have lots of cold weather up in Canada, I hear, where there are no bugs. Don't send them to that area.

Secondly, screen for mefloquine exposure. This should be done by civilians. You don't have the same Veterans Health Administration as we do in the U.S., so a lot of civilians are treating veterans. This should be part of a national discussion. Again, it's easy to do once a week versus once a day.

And then finally, the treatment part is harder, but we do need to get there. Just briefly to touch on the question of female service members' pregnancy and mefloquine, we probably need to do a better job of ensuring that female service members are on long-acting contraception before they deploy—for all kinds of reasons—because we don't know the effect of mefloquine on the developing fetus. Even if sex is banned in a combat zone, it happens, whether consensual or non-consensual, so we need to make sure that people are not pregnant on mefloquine.

Mr. John Brassard: I've been doing VA claims now for 23 years, and you ask a very good question. An individual's been deployed, they're on mefloquine, and if they develop symptoms during the use of the mefloquine, then you can at least have some sort of a trail. The difficulty is, what happens if the individual is not necessarily even aware of that or doesn't pay attention? They suck it up, with the macho sort of attitude and stuff, and then 20 years later, they come in and say, “I was on mefloquine, and I have all these symptoms.” Do they have a valid claim?

Dr. Donald Passey: That is a tough question, and that is something that needs to be very carefully considered by Veterans Affairs. Generally speaking, with our medical records within the Canadian military, if you're on medication, we should have a record of that, but records get lost.

The Chair: Mr. Fraser.

Mr. Colin Fraser (West Nova, Lib.): Thank you very much, Mr. Chair. Thank you to each of you for being here and for giving us some very interesting information.

I want to start with you, Dr. Nevin. With regard to just picking up on one of my friend's last questions, you had indicated that you would be okay with using this drug if it was a drug of last resort and you couldn't use the other malarials. Can you explain why? It's a little different from what Dr. Ritchie said. I'm curious to know. I assume it's because if you have no other option because of side effects of other drugs or for whatever reason, then it's better than being exposed to malaria. What would be your comment on that?

Dr. Remington Nevin: My position on this has developed somewhat over the years, and it's a complex and nuanced issue that also acknowledges the complex politics of this issue.

In the U.K., very recently, after our testimony and after a thorough parliamentary investigation, the Ministry of Defence essentially adopted a policy that mefloquine would be the drug of last resort. They didn't seemingly want to acknowledge it as such, but the policy is very clear. Mefloquine is to be used only when a soldier cannot tolerate any of the other safer and equally effective drugs.

If it takes allowing MOD to declare it a drug of last resort for the public health threat to be mostly mitigated, then that's fine. Perfect is the enemy of the good. I would prefer not to see any mefloquine used in military settings, because I believe it's virtually impossible for service members to abide by the product insert directions. How is it possible for a prescriber to counsel a patient who's going to a combat zone where they're going to be experiencing insomnia, where they're going to be experiencing anxiety, and where they may be experiencing nightmares as a result of what they're facing? How can a prescriber tell such a patient, “Here's a drug and to use it safely in accordance with the manufacturer's directions, you must discontinue it if you develop nightmares, insomnia, anxiety”? It would be malpractice for any civilian doctor to do that. I don't believe it's possible for us to use it safely in military settings.

That being said, I will concede there are some people who have good experiences with this drug and who have used it many times previously, For them, if they want to continue using it, I suppose that's okay, but for new soldiers who have no experience with the drug, I think it's a risk that's too great. I do believe that we will eventually be unanimous in our agreement that the drug has no place, but until then, I'm interested in reducing the use.

● (1700)

Mr. Colin Fraser: Do you have a comment on how many people would not be able to take the other types of drugs?

Dr. Remington Nevin: Yes. We discussed this in a number of papers. There are two safer daily alternative drugs in most areas of the world where there's chloroquine resistance, and one is Malarone, which is extremely well tolerated, and true contraindications or intolerance to Malarone are exceedingly rare, with maybe 1%. For the 1% who can't tolerate Malarone, there's doxycycline. The use of doxycycline is maybe discontinued by 20% or more. Far fewer than 1% of people would need to take mefloquine through strict adherence to a policy of use as a drug of last resort.

I don't think it's plausible to imagine a scenario where large groups of soldiers would not be able to deploy were such a policy enacted, and the potential benefits of doing so could be profound.

Mr. Colin Fraser: Are any of you aware of any lawsuits? Dr. Nevin, you touched on it, but are any of you aware of any lawsuits in any jurisdiction where this drug has been tested in civil court to determine whether or not liability was found in order to make a claim on this?

Dr. Remington Nevin: Yes, I am aware of multiple suits, either completed or pending. I've been involved as a consultant or expert in a number of successful cases in the United States. I've been involved in the same capacity in a number of cases overseas, and I do expect in the coming years that the number of claims against prescribers, against the governments that oversaw the prescribing of this drug, are going to face significant financial consequence.

In the United States, our military is protected from claims of liability due to something called the Feres Doctrine. Before the meeting, I was discussing this issue with my colleagues. My understanding is that Canada has no such immunity from torts, so I do think it's important for governments to examine their exposure on this issue.

Mr. Colin Fraser: Thank you.

Go ahead, Dr. Ritchie.

Dr. Elspeth Ritchie: If I may add, I agree with everything Dr. Nevin just said. The analogy in the United States is Agent Orange, the defoliant that was used in Vietnam. Really, mefloquine is one of a number of toxic exposures but it's the one we're focused on today. The Agent Orange analogy was, “Oh, that was nothing, it's all in your head.” Now I see Vietnam-era patients all the time. They've been exposed to Agent Orange. It's part of what is in their disability. It's part of what the VA compensates. And I would not be at all surprised if 30 years from now, or sooner, we will see mefloquine as the Agent Orange for this generation of Somali and Afghan veterans.

Mr. Colin Fraser: Thank you.

Perhaps I can ask Mr. Passey a quick question. You talked about nightmare Fridays. Dr. Ritchie mentioned nightmare Mondays, or something akin to that. I'm sorry if this is a dumb question, but is that simply because if you're taking the drug once a week, it's on the day you take it that you have really bad nightmares? Is it only on that day, or are there other effects throughout the week too?

● (1705)

Dr. Donald Passey: Certainly you can have effects throughout the week, but the highest concentration, the highest frequency, is on the day you actually take the medication. It's simply the way the medication is absorbed etc. Pretty much most people are guaranteed vivid if not full-out nightmares on that day. When I was overseas it was Fridays. It could have been Mondays for somebody else, but definitely it was on that particular day.

Mr. Colin Fraser: Thank you, Doctor.

The Chair: Thank you.

Mr. Kitchen.

Mr. Robert Kitchen (Souris—Moose Mountain, CPC): Thank you all for coming today.

I have a whole bunch of questions. I've not taken as many notes in a long time. I'll try to get in as many as I can in this short period of time.

Dr. Nevin, can you comment on what trials might have been done prior to this drug being put on the market? From an understanding that someone doesn't simply come up with the idea, then here it is, there is research done before it's put out there and is used. From your research, can you comment on that?

Dr. Remington Nevin: It's important to understand mefloquine's development in context. This is just the latest in a series of quinoline drugs that the U.S. military, which developed mefloquine, had quite a bit of experience with. I have always thought it would be reasonable for the U.S. military to have expected that mefloquine would have many of the same side effects that it had seen previously with other synthetic quinoline drugs, including atebrin, used in World War II.

In fact, I found a paper from the World War II era that described atebrin causing symptoms of anxiety, depression, restlessness, and confusion and these symptoms predicting the development of a more serious psychosis or what I refer to as an encephalopathy. It's that very language that seems to have been echoed in the product insert when Roche finally marketed the drug. I do believe that during marketing of the drug, there was knowledge of these effects.

Certainly looking back on some of the studies that were done, it's remarkable that they didn't see as much of this as we see today in studies. It was either tremendous luck on the part of the investigators to not have observed these effects, or it was something else.

One important point I think we should emphasize is that Canada's first experience with this drug was part of a safety study that was conducted in the early 1990s and through which the Department of National Defence gained access to large quantities of mefloquine for use during the early months of the Somalia mission. It was not a licensed drug in 1992 and into the first weeks of 1993 when many service members started taking the drug and deployed to Somalia.

The Department of National Defence's access to that drug was contingent on participating in a safety study that should have informed the licensing of the drug, should have informed the content of the product label, should have informed physicians of the side effects that would be experienced with regular use of that drug.

You ask what studies were done. The study that should have been done on military personnel was not done, and the drug was licensed without the benefit of what, in retrospect, probably was very important information.

Mr. Robert Kitchen: We're aware that the gold standard, an RCT, is difficult to do in such situations, but the situation is as you mentioned. We know that soldiers follow orders, and when they're told, they do; and their families follow orders.

My father served and was in Gagetown and was subjected, as Dr. Ritchie mentioned, to the issue of Agent Orange in testing that was done in Canada. Likewise, we lived in Pakistan and we were told we'd take malaria medication and this was the medication we would take, end of story.

Just to go on more of a scientific bent, we're always looking for concrete data to try to say how it is, and it's very tough to come up with concrete data when we're dealing with neuropsychiatric disorders. We're talking about liver toxicity, brain stem toxicity, limbic toxicity.

Dr. Passey, you mentioned blood tests. I'm wondering if you could explain some more about that and just enlighten the committee on some of those tests that may be evident, if they are or not, and how experimental they are.

● (1710)

Dr. Donald Passey: Dr. Mark Gordon has been working on this area for about 19 years in the U.S. He's been working with U.S. veterans including Green Berets, Navy Seals, Army Rangers, etc. He was looking at traumatic brain injuries particularly, but he's also found that with post-traumatic stress disorder there are certain metabolic pathways when individuals have got brain trauma. I think of PTSD very differently. It's actually trauma to the brain. It's secondary to extreme stress or cumulative stress, but it actually causes dysfunction in the brain. I don't like the whole mental health thing.

He has basically established that there are these metabolic pathways, and I'm in the process of doing all the reading and trying to get up to speed to pass this exam, so I can actually start doing this in Canada. When you correct those, it's not by using drugs. It's actually by using precursors and compounds that are normally found within the body. When you correct those pathways, then it corrects the symptoms.

Very quickly, there's a thing called cortisol steal. Under a lot of stress, people have to produce cortisol. When they do that, the other pathway is to testosterone. That ends up not being produced. A lack of testosterone in the brain will cause things such as anxiety, insomnia, irritability, and concentration problems. So when he treated those pathway disorders in an individual, Andrew Marr, who he actually treated, his symptoms all settled and he got off all his psychiatric medication. That's the direction I think we need to start going.

The Chair: Thank you.

Ms. Jolibois, you have three minutes, and then we are going to do one quick round of three minutes each, and that will take us to the conclusion.

Ms. Georgina Jolibois: Thank you.

Dr. Ritchie, I know what your answer is in terms of the use of mefloquine.

In the Canadian system currently, can you describe more, so that I have a better understanding, if we cease to use this or continue to use this?

Dr. Remington Nevin: I'm sorry, could you restate the question? I'm not sure I understood.

Ms. Georgina Jolibois: In our Canadian system my understanding is that it's still being used, so how can we ensure that we have further discussion to continue using versus not to continue using?

Dr. Remington Nevin: If I may, Mr. Chair, the policy changes that we've seen in other country's militaries—in the United States, in the United Kingdom—they have generally followed or have reflected regulatory re-evaluation of the drug.

In the United States, around the time that the U.S. military formally declared it a drug of last resort, the FDA was adding the boxed warning to the medication. Similarly, in the U.K., some years ago a similar warning was added across Europe and now the Ministry of Defence has declared it a drug of last resort.

I do think that any substantive policy re-evaluation here in Canada should be informed by an updated mefloquine product label. The Canadian product label for mefloquine does not state that the drug can cause permanent effects. The Canadian drug label does not state, as it does in other countries, that you should immediately stop taking the drug at the onset of nightmares or abnormal dreams.

I would argue that an update to the label should probably precede a policy re-evaluation. That being said, if the Department of National Defence and others feel there is sufficient information, even in the absence of that update, to warrant action, then of course adopting a policy that reflects that seen in other countries would, in my opinion, be entirely reasonable.

Dr. Elspeth Ritchie: Perhaps I could add to it. I think both Dr. Nevin and I would be happy to advise or consult with a group, if you pulled one together to look at this issue, and that's often where it starts, with a review of the science.

There is sometimes bias. In some cases people do feel, again, that this is a hysterical reaction. In part of the work we're doing at the VA, the neurologist told us outright that he didn't believe in mefloquine toxicity, and he had told that to a patient and his wife, who became very upset. You need to have some people who are academic, independent.

In the U.S. we have, for example, the Institute of Medicine, as a body that can pull together thinkers. And I would recommend some kind of pulling together, and that's going to be epidemiologists, people who do research on malaria.

I'll go back to the other question about testing. One important thing to think about is that neuropsychological testing can be very helpful, and as part of that it's just to get to know what tests are useful.

● (1715)

The Chair: Thank you.

We'll start the next round with three minutes each, and we're going to go with Ms. Wagantall first.

Mrs. Cathay Wagantall: I appreciate what I just heard about the offer to be part of dealing with this issue in Canada, and lending your expertise and being part of that dynamic.

Clearly, then, we would have the people prepared to come and do the studies. What we need is the people to be studied. Would you see an outreach program to our veterans being a significant part of that whole process so that we get the clarity that we need here in Canada? These are the people we are concerned about on this issue.

Dr. Nevin.

Dr. Remington Nevin: If I may, that's the idea of a specific outreach to veterans who may have been affected. This is a consistent request by veterans groups internationally. We've seen this request articulated in Ireland, in the United Kingdom, in the United States, and in Australia.

I think the implementation of that kind of outreach program is very helpful. It would demonstrate acknowledgement of the problem by the government, either by the military or by the Department of Veterans Affairs. This is critical. It has been critical in the United States where for many years mefloquine was sort of like a Lord Voldemort, it was that-which-shall-not-be-named. One could not ascribe ill effects to the drug. Now clinicians, who for many years have suspected their patient may have been injured by the drug, feel more comfortable coming forward now that there are tangible steps being taken to sponsor studies.

I think a formal outreach program has the benefit of clearly articulating to the military, to veterans workers, and to clinicians that the government takes this seriously, that the government will support you when you propose that an individual soldier may have been injured by the drug. Also, it has the practical benefit of giving veterans and soldiers information they may not have heard. Social media and regular media go only so far. I think many more veterans could be reached through such a program.

Dr. Elspeth Ritchie: And quickly, if I could add, it would reach the family members. It's often the family members who are very concerned, very affected, and likely would be very interested in such an outreach.

The Chair: You have 30 seconds.

Mrs. Cathay Wagantall: Can you talk briefly to the fact that they may be treated for PTSD at the same time? How does that complicate whatever medications they're taking for that treatment when it may not be PTSD?

Sorry, that's not a 30-second question.

The Chair: Okay, where do we want to send it? One person, then.

Mrs. Cathay Wagantall: Who would like to take that? Dr. Passey?

Dr. Donald Passey: Let's be clear. At the present time I don't necessarily treat PTSD. What I treat are the symptoms the person is struggling with.

Mrs. Cathay Wagantall: Good enough.

Dr. Donald Passey: Whether it's due to a traumatic brain injury, PTSD, major depression, or mefloquine, right now we're limited in what we can look at and actually analyze. So what do I do? I use my current medication regime and my talking regimes to treat the symptoms they're struggling with.

Mrs. Cathay Wagantall: Okay.

The Chair: Thank you.

That was 30 seconds exactly.

Mr. Bratina.

Mr. Bob Bratina (Hamilton East—Stoney Creek, Lib.): Thank you.

This has been a brilliant but disturbing session, I have to tell you, particularly for me, because I have a motion and a private member's bill coming forward that have to do with toxic encephalopathy with regard to lead pipes and lead in developing children. We know that lead attacks the prefrontal cortex and results in irreparable damage to the brains and, therefore, the behaviours and potential of these young people.

You mentioned imaging of the brain with regard to soldiers having used mefloquine. Is it a clear indicator, the brain imaging?

● (1720)

Dr. Remington Nevin: If I may rephrase, is there an objective testing modality? Is there an imaging modality? Is there some sort of test we can give to veterans to determine whether they may be suffering these chronic effects?

Unfortunately, the answer is no. There is no imaging modality yet that I am aware of that can reliably, validly, distinguish between people who are affected from those who aren't.

I do feel—and perhaps the others will add to this—that there are some imaging modalities that may hold promise in conjunction with some other tests. But for the moment, the diagnosis, if you will—and we should recognize there is yet no accepted medical diagnosis of mefloquine toxicity syndrome. Perhaps one day there will be. The identification of someone who may be suffering from these effects is mostly clinical. It's based on history, when the symptoms developed, and the combination of signs and symptoms they have.

Mr. Bob Bratina: Dr. Passey, do the service records show the use of mefloquine, or is it just assumed that, if you were in Afghanistan or Somalia, you likely used it?

Dr. Donald Passey: That's a good question. Typically the records should show vaccinations and a use of medication. Do the records actually show that? That's a good question. That's something that should be put to the military. When I go home I'm going to check my own medical file to see whether that's actually noted.

Mr. Bob Bratina: Finally, regarding the supervision of these drugs and medicines, you say you have to take these things, but they are probably not taken in front of a medical provider. Where would the mefloquine actually be ingested by the soldier in the field?

Dr. Donald Passey: I think that's dependent on the unit itself. Typically, in the deployment I was at, it was handed out on Fridays from basically the pharmacy.

Mr. Bob Bratina: My questions are going to take a lot longer, so I'll pass.

The Chair: Ms. Jolibois.

Ms. Georgina Jolibois: I'm curious. Dr. Ritchie, you mentioned Dr. Matchee. How can I get information on Dr. Matchee? He's in my riding. His family is in my riding. His family has come forward to get assistance on that. Would I be able to get that from someone?

Dr. Remington Nevin: Mr. Chair, if I may, I'm not sure whether Dr. Ritchie has spoken with the family. I have spoken with Clayton Matchee's wife. I have also spoken with a number of his units and members. I feel very confident that I can render an opinion as to whether his behaviour during that time may have been in some way affected by the drug.

I do have a very strong opinion of that. I don't know if this is necessarily the right forum in which to share that information. Perhaps more important is that with the information we have available today, with the literature, with the science, with the recent acknowledgements by drug regulators of this drug's effects, I think many of the points of confusion that dominated this discussion in previous decades no longer apply, and we could come to a much more solid mutual conclusion about the events of that day, including the role of the drug in his particular case.

The Chair: Mr. Eyolfson.

Mr. Doug Eyolfson: Thank you.

I guess I'll throw this question open to everyone on the panel. It has come to my attention that some U.S. veterans have been compensated for conditions caused by mefloquine.

Do we have an estimate of how many service members have been given awards for this, and what levels of compensation? I'm interested in the numbers and the level of compensation they would get.

● (1725)

Dr. Remington Nevin: Again, if I may, not speaking to the Canadian experience in particular, but overseas—

Mr. Doug Eyolfson: Sorry. I was thinking mostly about the American experience.

Dr. Remington Nevin: I can address that question.

In the United States, we have a veterans administration that awards disability claims for conditions such as post-traumatic stress disorder and the effects of traumatic brain injury.

It's my experience that a fair number of veterans who have been suffering what are primarily effects from mefloquine are able to be compensated to some degree through awards for these other conditions. It is possible that some veterans have been essentially misdiagnosed with post-traumatic stress disorder. That's an academic subject whether it's a correct diagnosis or not in the presence of mefloquine effects. Others have been mistakenly attributed to traumatic brain injury.

Where veterans face more difficulties, though, is when mefloquine toxicity symptoms manifest, for example, primarily as a psychotic disorder, or primarily as a panic disorder, or what is sometimes called an adjustment disorder. There may be less willingness on the part of the adjudicators to attribute those conditions to combat. Of course, this speaks to the fact that we don't yet have a diagnosis for what is, I believe, a genuine syndrome.

If we ever do have formal diagnostic criteria and formal recognition in the medical community for this syndrome, then, of course, that syndrome would be what is compensated in the United States. I think many more years of research are necessary in order to ensure that we can make that distinction with clarity.

Dr. Elspeth Ritchie: If I may add, the number one disability in the Veterans Health Administration is mental disorders. A lot of that is PTSD, a lot of that is depression, and some is psychosis. In my experience it's relatively easy to get a mental health diagnosis. Of course, the DSM has been changing. In the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, the diagnosis of PTSD in my opinion has made it easier to get that diagnosis. I don't think the actual number of veterans with mental health diagnoses would change much, to say what Dr. Nevin did in another way, but whether the addition of exposure to mefloquine and toxicity would change, for example, the level of the rating, I think there is a very real chance.

In addition, in the past to get a diagnosis of PTSD you had to have exposure to combat and traumatic events and many people on mefloquine were not necessarily exposed to combat or traumatic events and may have not gotten that diagnosis because they weren't actually in a war zone, say, they were in the Horn of Africa or some place like that.

The Chair: Thank you.

That ends the time for today for questioning.

We could give each of the witnesses a minute to wrap up.

We can start with Dr. Passey.

Do you have any concluding remarks?

Dr. Donald Passey: I think in the whole issue around mental health disorders, I don't like the term, these are brain disorders. Whether it's caused by toxic effects of chemicals, the toxic effects of cumulative or traumatic experiences, it impacts the brain in a negative manner and that's what we need to be focused on. The term "the diagnosis" is not near as important as the actual effect and the level of dysfunction that we see in our veterans. We need to be looking at a new directions in regard to being able to diagnose these disorders as well as treatment.

The Chair: Thank you.

Dr. Ritchie, would you like a minute to conclude?

Dr. Elspeth Ritchie: Yes.

First of all, it's really exciting to have this conversation. I've worked with the Canadian Forces many times in many places. I would like to continue the conversation.

What we have seen in the areas of PTSD and suicide is that often the U.S. has been there first with larger forces and has seen the problems first. I think we've seen that with mefloquine, but then we see that Australia, the U.K., and the Canadians, down the road a few more years, are having the same problems that we are having.

I really want to congratulate all of you for being courageous enough to have this conversation.

● (1730)

The Chair: Thank you.

Dr. Nevin.

Dr. Remington Nevin: Thank you very much, Mr. Chair.

I must say, it's a tremendous honour to be invited to speak to the committee today. I am originally from Canada. I was born and raised in Toronto so it's really very satisfying for me to be able to return to my home and native land to be able to assist the committee with this important issue.

I see a few priority areas for action. As I mentioned, Health Canada should be encouraged—amidst all of its other responsibilities, I recognize—to re-examine the labelling for this drug. If further action is necessary from the perspective of Veterans Affairs, research, research, research. Funding is necessary to motivate clinicians, physicians, scientists, to devote the effort necessary to investigate this matter fully.

Thank you, Mr. Chair.

The Chair: Thank you.

I'd like to thank all of the witnesses today on behalf of the committee for your excellent testimony.

Again, if there is any other information you want to get to the committee you can email it to the clerk and the clerk will get it to us.

There is a motion to adjourn by Mr. Bratina.

The meeting is adjourned.

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