



**NATIONAL ARTS CENTRE  
CENTRE NATIONAL DES ARTS**

**ROUNDTABLE ON  
MUSIC AND MEDICINE**

**OCTOBER 1, 2005  
NATIONAL ARTS CENTRE  
OTTAWA**

***ROUNDTABLE ORGANIZER:***

**NATIONAL ARTS CENTRE  
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**NATIONAL ARTS CENTRE  
CENTRE NATIONAL DES ARTS**

Dear Reader:

One of the things that struck us about this year's National Arts Centre Roundtable on Music and Medicine was, in a room full of leaders from the worlds of science and business, how much the participants felt connected to music in their own lives.

As the discussion dove deeper into the subject at hand—the relationship between music and health—the participants related to the subject in a very personal way. Dr. Christopher Paige, Vice-President of Research for the University of Toronto's University Health Network, said that humming eased his anxiety. Leslie Bissett, a Calgary philanthropist, noted that her dying mother became less agitated when she listened to Arthur Rubinstein playing Chopin. It was becoming clear that people understood first-hand what CanWest Global Foundation President Gail Asper meant when she quoted the composer George Frideric Handel: "Art thou troubled? Music will calm thee."

Perhaps it was fitting, this blending of science and art, the factual with the personal. After all, as Canadian Institutes of Health Research President Alan Bernstein observed, both a scientific equation and an orchestra concerto are rooted in precise systems, but both can also be understood no matter what language you speak.

The scientific evidence about how music affects human beings was compelling, as you will read. One by one, presenting participants from various specialties revealed that music does indeed affect our bodies, our brains and our health.

The participants also advocated for more investment in research to explore those links further. That is why we are so pleased to have hosted this first roundtable and why we eagerly await our next two roundtables on health and the arts in 2006 and 2007.

The National Arts Centre and National Arts Centre Foundation roundtables provide a forum for community leaders to discuss how their work relates to the world of the performing arts. As the scientists and doctors have shown us this year, that world may have value in more ways than we currently understand. We encourage individuals, businesses and government to support these leaders in their quest for knowledge in this very exciting new area.

Yours truly,

Peter A. Herrndorf  
President and CEO  
National Arts Centre

Darrell Louise Gregersen  
Chief Executive Officer  
National Arts Centre Foundation

# REPORT ON THE NATIONAL ARTS CENTRE ROUNDTABLE ON MUSIC AND MEDICINE

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**Proud Sponsor of the 2005 Roundtable on Music and Medicine**

**Introduction**

This report summarizes the discussion at the *National Arts Centre Roundtable on Music and Medicine*, convened on October 1, 2005. This first in a series of three yearly roundtables on the subject of health and the arts examined the links between music and medicine. How music helps us understand the brain and improves learning, can be used to treat stroke and help people with cancer—these were just some of the areas participants discussed in the three and a half hour session.

The roundtable was designed specifically so that the subject could be approached from different angles. Opening addresses by Louise T. Blouin MacBain, Chairman of the Louise T. Blouin Foundation, and Dr. Alan Bernstein, President of the Canadian Institutes of Health Research, spoke on music and medicine from a funding perspective.

Each of the subsequent presentations offered a more specific look at the relationship between music and medicine as scientists and doctors from various disciplines took the podium. Dr. Robert Zatorre, professor and cognitive neuroscientist at the Montreal Neurological Institute of McGill University, and Dr. Isabelle Peretz, professor of psychology at the University of Montreal and co-director of the International Laboratory for Brain, Music and Sound Research, gave brief presentations from their research that illustrated how music can broaden our understanding of brain function.

Dr. Antoine Hakim, professor and university chair of neurology at the University of Ottawa and CEO and Scientific Director of the Canadian Stroke Network spoke about how music can help people who have suffered from a stroke.

Dalia Gottlieb-Tanaka, M. Arch, PhD candidate, Institute of Health Promotion Research at the University of British Columbia, discussed how people with dementia relate to music and the arts, while Dr. Glenn Schellenberg, professor of psychology at the University of Toronto, shared his findings on the effect of music lessons on Grade 1 students. Finally, Dr. Christopher Paige, Vice President of Research at the University Health Network at the University of Toronto, discussed the role music could play in treating cancer.

Don Newman, Senior Parliamentary Editor at CBC Television, chaired the discussion.

Respondents were:

Mrs. Gail Asper, Corporate Secretary, CanWest Global Communications and President, CanWest Global Foundation;

Dr. Judy Beamish, Vice-President and Chief Medical Director, Sun Life Financial;

Mrs. Leslie Bissett, community philanthropist, Calgary;

Mr. Jean-Pierre Blais, Assistant Deputy Minister, Cultural Affairs, Department of Canadian Heritage;

Dr. Arthur Carty, National Science Advisor, Privy Council Office;

Dr. Richard Goldbloom, Chancellor and Professor of Pediatrics, Dalhousie University;

Mr. Leonard Lee, President, Canica Design, Chairman, Lee Valley Tools and Veritas Tools;

Ms. Elise Orenstein, past chair, Board of Directors, Artists' Health Centre Foundation;

Mr. Ian Shugart, Senior Assistant Deputy Minister, Health Canada;

Dr. Martin L. Silbiger, Chairman Elect, Tampa Bay Performing Arts Centre, Professor and Chairman, Department of Radiology, USF College of Medicine and H. Lee Moffitt Cancer Center and Research Institute;

Honourable Jim Watson, Minister of Health Promotion, Government of Ontario;

Dr. John Wright, Gastroenterologist, Vice President, University Health Network, Associate Professor of Medicine, University of Toronto;

Ms. Janet Yale, Executive Vice-president, Corporate Affairs, TELUS Communications.

The National Arts Centre's three previous roundtables addressed issues relating to corporate sponsorship and individual philanthropy in the performing arts, as well as public and private sector partnerships. The roundtables have featured a wide range of Canadian and international participants, including: keynote speakers James Wolfensohn, president of the World Bank and chairman emeritus of the John F. Kennedy Center for the Performing Arts; Richard Bradshaw, general director of the Canadian Opera Company; and former Federal finance minister John Manley.

This year's roundtable leadership discussion was sponsored by Sun Life Financial.

## **Welcoming Remarks**

NAC President and CEO Peter Herrndorf welcomed guests and thanked NAC Foundation CEO, Darrell Gregersen, for bringing the subject of music and medicine to “an important public forum.”

Mr. Herrndorf said the idea for the forum was partly inspired from witnessing the success of the NAC’s music education programs, which touch thousands of young people across the country every year.

“That led to the NAC posing the question, ‘Who else might benefit from such an extensive exposure to the performing arts?’”

The NAC has already begun exploring the possibilities that may exist surrounding the intersection of music and medicine. In the spring of 2005, the NAC partnered with the Ottawa Regional Cancer Centre by donating NAC Orchestra CDs to the cancer centre’s chemotherapy program. The NAC also hosted a benefit on behalf of the cancer centre that featured singer Holly Cole.

“We’re here today to find out what more can be done,” Mr. Herrndorf said.

Mrs. Gregersen said she became fascinated with the interplay between the arts and health during her previous career as a fundraiser for health care. Whether in seeing a young boy with a traumatic brain injury use music to learn how to express himself, or in watching an expert neurosurgeon at The Hospital for Sick Children compose himself for surgery through the piano, it seemed the links were there, she said. She also said NAC Music Director Pinchas Zukerman embraced the idea of exploring the subject for an NAC roundtable.

## Opening Addresses

The morning began with an address from Louise T. Blouin MacBain, who offered her perspective as a prominent funder of creativity research. Ms. MacBain chairs the Louise T. Blouin Foundation, an organization whose mandate is to promote creativity and support research about creativity and its potential to help solve global problems. In her remarks, Ms. MacBain said studies have shown that music can improve people's health in many powerful ways.

"Music can help stroke victims to walk, terminal patients to relax, mothers to give birth, troubled teens to learn social skills, students to study, Alzheimer's patients to remember, and even unborn children to respond to the environment around them."

The larger question, Ms. MacBain said, is discovering what role music, art, culture and creativity play in changing the world for the better. She noted that some businesses and organizations have already caught on to the power of creativity. For example, the London Business School has established an artist-in-residence program, and UniLever has hired painters, poets and comic-book creators to inspire its staff to be more creative, she said.

Nations of the world must embrace creativity, not only to improve their economies, but to improve health, the environment, education, poverty and conflict resolution. Ms. MacBain said she wants to work with scientists to help people see "how music heals, how creativity works, and how we can use the power of art, culture and creativity to create a better world."

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Dr. Alan Bernstein gave the morning's second address. Dr. Bernstein heads Canada's premier health research funding agency, the Canadian Institutes of Health Research, which funds over 8,500 researchers in universities, teaching hospitals, and research institutes across Canada. Its 2004-05 budget was \$662 million. According to its Web site, the CIHR mandate is "to excel, according to internationally accepted standards of scientific excellence, in the creation of new knowledge and its translation into improved health for Canadians, more effective health services and products and a strengthened Canadian health care system."

Dr. Bernstein told participants the roundtable might well have been called "Music and Health" because it seems clear that music can improve well-being. As an example, he pointed to the fact that many people are taking up musical instruments later in life, including Health Canada senior assistant deputy minister (and NAC Roundtable participant) Ian Shugart. Doing so promotes health because it encourages lifelong learning, exercises the brain and helps people stay engaged with life, all of which are important for an aging society, Dr. Bernstein said. In a similar vein, he said it is likely no accident that conductors tend to live long lives, but rather a consequence that their jobs as conductors require them to be active physically, mentally and socially.

“There are some lessons there for healthy aging,” he said.

Dr. Bernstein noted that society is becoming interested in the link between music and health, particularly as more and more people embrace holistic medicine. He noted that Aboriginal communities have long used music in healing.

“Perhaps we have a lot to learn, or a lot we have lost, in moving into twenty-first century medicine, that we need to regain as a Western-based society.”



## **Music and Brain Imaging**

As he closed his address, Dr. Alan Bernstein led into the morning's first presentations on music, the brain and learning, by observing that there is much to learn, particularly because of how little Western medicine actually knows about how the organ actually works.

"We know it's made of lots of neurons, and other kinds of cells. We know that those cells make connections with each other, and they send electrical and chemical messages to each other. But what that means in terms of a higher order is completely a black box."

Dr. Robert Zatorre and Dr. Isabelle Peretz are two of Canada's leading researchers into the complex and fascinating relationship between music and the brain, and have been studying this area for over 20 years. Dr. Zatorre, a professor and cognitive neuroscientist at McGill University's Montreal Neurological Institute, and Dr. Peretz, a psychology professor at the University of Montreal, have been pursuing research with eight other colleagues at BRAMS—a consortium launched in 2004 that studies the brain, music and sound. Some of the questions BRAMS seeks to answer include: Why is the brain musical? How does the structure and function of the nervous system allow us to listen to, remember, play, and respond to music? How are these functions related to others such as understanding speech? How do these processes change during development, and how do they break down in disease? Dr. Peretz specializes in the cognitive processes underlying music, while Dr. Zatorre has focused on the structure and function of the auditory cortex.

Part of the reason to study the relationship between music and the brain is that it helps improve our understanding of how the brain works.

In presenting some examples of his research, Dr. Zatorre said that part of the reason to study the relationship between music and the brain is that it helps improve our understanding of how the brain works. For example, he has found that brain scans of people who are simply imagining a piece of music actually show activity in the part of the brain that is normally responsive to sound.

"This is just one way that we can probe what's going on internally in your mind when you're thinking," he said.

He and his colleagues also found that people with absolute or "perfect" pitch show brain patterns different from those of equally well-trained musicians who do not have this gift.

"It's illustrating the way that probably different genetic and environmental influences shape brain function, such that, by the time you get to be an adult, you have different types of brain responses to the same sound. That's a general paradigm, I would argue, for understanding a lot of important features of how our brains work."

Music is also linked to emotion, Dr. Zatorre said. When some of his colleagues asked McGill students to rate things that gave them pleasure, music outranked good grades, food, money, sports and art. He studied this further by scanning people while they listened to music that gave them “the chills,” or shivers down the spine. The result was a very complex set of brain responses, accompanied by physiological responses such as increases in heart rate and muscle tension. In fact, the region of the brain that lit up with the chill-inducing music was the same one activated when exposed to strong stimuli, such as food and sex. But unlike food and sex, music is not necessary for survival or procreation. The fact that music can ignite that same region in the brain is remarkable, and suggests that the need for music is actually hard-wired into us.

“If you’re hungry, you need to eat to survive, so that’s why the food tastes so good. And if we didn’t mate, the species would die out. But music doesn’t give you any specific direct benefit. You won’t starve without music and the species will continue.”

Dr. Zatorre concluded his presentation by saying that more research is needed to be able to understand the relationship between music and the brain. He thanked the Canadian Institutes of Health Research, which funds about 80 per cent of his research.

In her presentation, Dr. Peretz illustrated various parts of her research, mainly concerning how music relates to brain-damaged subjects or those with congenital anomalies. She projected video-images of her subjects, including:

- An Alzheimer’s patient who can sing the tune of *Frère Jacques* but with unintelligible words, showing that the music is not helping him remember the lyrics.
- A brain-injured musician with absolute pitch who sings a simple tune completely off-key without being aware of it.
- An autistic woman plays on the piano a complex piece she has heard only once, and improvises on the melody.
- A case of congenital amusia, or “tone deafness,” in which a man can recognize *La Marseillaise* when the lyrics are read to him, but is unable to recognize it when the piece is played on the piano.

### ***Respondent Reactions***

NAC Music Director Pinchas Zukerman recounted how a Hungarian student could not draw his violin bow across the strings while counting 1,2,3 in English, but had no trouble when he did the same in Hungarian.

Gastroenterologist Dr. John Wright, Vice President of the University Health Network and Associate Professor of medicine at the University of Toronto, said anesthetists are observing that patients under conscious sedation who listen to music on their iPods require fewer anesthetics than those patients who undergo the procedure without music. Patients who listened to music also required less intervention with agents to control blood pressure and heart rate, he said.

Dr. Peretz said her colleagues have also observed that music can help pain or stress recovery, and noted that certain pieces of music seemed to work for everyone.

Dr. Richard Goldbloom, chancellor and professor of pediatrics at Dalhousie University, said research has shown that babies that were exposed to a piece of music in utero had a different response to the music after being born than those babies who were not exposed to the music during pregnancy.

Elise Orenstein, past chairman of the board of the Artists' Health Centre Foundation in Toronto, asked Dr. Peretz how rhythm affected the brain. Dr. Peretz said the research is unclear, but that some work is being done with metronomes to help people recover speech and avoid stuttering, as well as in helping people with movement disorders, such as Parkinson's disease.

**It was obvious the way in which music really promoted their emotional well-being.**

“People have demonstrated that a rhythmic stimulus will help them entrain their movements. And that's probably the same mechanism that makes all of us want to move or tap when we hear music. I think what we don't know is exactly how does the motor system interconnect with the auditory system. Why is there this close connectivity?”

Janet Yale, Executive Vice-president of Corporate Affairs of TELUS Communications, commented on how music can affect overall well-being, after having watched a group of employees perform in a band during a stressful employee strike.

“They had really come together and shared their passion for music. It was obvious the way in which music really promoted their emotional well-being.”

## **Music, Stroke and Dementia**

The next two presentations explored how music is being used to help people who have suffered strokes, as well as people with dementia.

Dr. Antoine Hakim, professor and university chair of the University of Ottawa's neurology department, was the first presenter. Dr. Hakim is also the Director of Neuroscience Research at the Ottawa Health Research Institute, the CEO and Scientific Director of the Canadian Stroke Network, and the Senior Director of the Heart and Stroke Foundation of Ontario Centre for Stroke Recovery.

In his presentation, Dr. Hakim said music may be a key ingredient in helping the brains of stroke patients to repair themselves, citing evidence from Colorado State University researchers who found that stroke victims and people with Parkinson's Disease walked more steadily and with more speed if they practiced with a metronome or piece of music with strong, even rhythm. Music seems to have a powerful effect on motor skills, he said.

Dr. Hakim explained that when someone has a stroke, part of the brain is damaged, as is its accompanying function. Soon, however, neighbouring cells begin to make new connections in order to repair the brain and recover the function. That is where music may play a role, he said. For example, music therapy that uses activities such as singing, playing rhythm instruments and participating in movement, has been shown to help stroke victims recover language, although more research is needed to understand why, he said.

"You desperately want to believe what you read," he said. "There's something intrinsically musical about the brain's neurological functions. The right song can distract us from pain, boost our mood, revive old memories and even prompt the body to match its rhythms."

Music may be a key ingredient in helping the brains of stroke patients to repair themselves.

In her presentation, Dalia Gottlieb-Tanaka talked about how the arts can help people with dementia. Ms. Gottlieb-Tanaka has a Master's degree in Architecture and is a doctoral candidate at the University of British Columbia in the Interdisciplinary Studies Program at the Institute of Health Promotion Research. She is currently training caregivers in dementia care in the Creative Expression Activities Program she conceived and developed to improve the quality of life of seniors with dementia.

Ms. Gottlieb-Tanaka said the arts can boost the mood of people with dementia and allow them to "turn disabilities into opportunities." She also said she believes that the desire to be creative does not diminish as people age, even when they suffer from dementia. Not only do many of her clients enjoy working on creative arts such as painting, some will show artistic talent, she said.

She also suggested that music has a calming effect on people with dementia. She told the story of Mildred, a client of hers who would often be distracted and agitated, except when she would talk about music.

“Every two minutes she would get up and say, ‘The bus is coming to pick me up, the bus is coming to pick me up.’ But when we talked about music, she was sitting very still and was listening very carefully to everything.”

“Art is a healing in itself, and music is included.”

## **Music and Learning**

After a short break, Dr. Glenn Schellenberg, professor of psychology at the University of Toronto, began his presentation on cognitive development in children. Dr. Schellenberg's research focuses on reciprocal influences between music and cognition: how listeners perceive and remember music, how our cognitive abilities constrain the forms music takes, and how exposure to music affects the way listeners think, reason, and feel. He has received funding from the Natural Sciences and Engineering Research Council of Canada, the Social Sciences and Humanities Research Council of Canada, the Canadian Institutes of Health Research, and the International Foundation for Music Research. In 2002, he received the Premier's Research Excellence Award from the province of Ontario.

In his presentation, Dr. Schellenberg said he has found that music lessons have a small but general, positive effect on intellectual functioning. In a study in which six-year-olds were given lessons in either keyboard, voice, drama or no lessons at all, children who took music had larger increases in IQ (although all children had slight increases as a consequence of attending school). Schellenberg noted that the findings were true regardless of family income or parents' education level.

The IQ increase seen in the subjects who took music lessons might be explained because music requires many skills, and allows children to express themselves, he said.

"Music is so rich and multi-dimensional in a cognitive sense, so that you learn how to express yourself emotionally, you learn how to focus your attention, to concentrate, you improve your fine motor skills. So it could be that constellation of abilities that's driving the effect."

Another possibility is that learning music is like learning a second language, which is known to result in "cognitive advantages," he said.

The researchers selected the subjects by placing an ad in the paper and randomly assigning the children, who were about to begin Grade 1. The children were tested before they began Grade 1, and again in the summer before Grade 2.

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On a broader note, Dr. Schellenberg said that while many people have claimed that music helps students improve in math, in fact, improvement is actually reflected in several areas of learning, such as verbal comprehension, perceptual organization, freedom from distractibility and processing speed.

"The effect extends across all four," he said. "It's not specific to math, it's not specific to verbal reasoning, it's not specific to special abilities."

***Respondent Reactions***

Prime Minister Paul Martin's Science Advisor Dr. Arthur Carty remarked that Schellenberg's results could have real implications for early childhood education. He suggested that arts organizations should advocate for the teaching of music in schools at an early age.

NAC Foundation CEO Darrell Gregersen replied that the NAC is doing just that, and held up a copy of an op-ed piece by NAC music director Pinchas Zukerman advocating more music education that had appeared in the *Ottawa Citizen* that day (it later appeared in the *Vancouver Sun* and the *Edmonton Journal*).

Dr. Martin Silbiger, chairman elect of the Tampa Bay Performing Arts Center, said that when he was dean of medicine at USF College of Medicine, he began encouraging the students to see theatre. He also sent them to play music in hospices and homes of dying patients.

"It has a very, very strong emotional impact," he said. "It's interesting. When we have music at our grand rounds we get a better turnout than we normally do....so we have found that music and plays and other of the artistic areas have been very valuable."

## Music and Cancer

The morning's final presentation was on whether music can be used to help people with cancer.

The presenter was Dr. Christopher Paige, Vice President of Research at the University Health Network at the University of Toronto. Dr. Paige is an internationally recognized leader in the area of lymphocyte development and antibody formation. He is the Principal Investigator in a Terry Fox Program Project on blood cell development. He also holds grants from the Medical Research Council and the National Cancer Institute. His original research is published in leading scientific journals including *Nature*, *Science*, *Cell* and the *Journal of Experimental Medicine*. He has served on the Research Advisory Boards of both the National Cancer Institute and the Arthritis Society of Canada.

Dr. Paige told participants that some studies have shown that music may have a positive effect on cancer patients. One likely place to see that effect is in the relationship between music, state of mind, and health. It is generally believed that a person's mind can influence the body, in certain cases, he said. For example, people with strong support networks have lower general mortality when it comes to most diseases. One study found that general mortality was lower in

“A negative state of mind has been thought to lower immunity and increase illness,” Dr. Paige said. But it is not yet known whether a decrease in immune response can lead to cancer.

the days leading up to Passover, indicating that people looking forward to major family events were less likely to die. Other studies have shown that the rate of death in husbands that lose their wives goes up dramatically in the eighteen months following the loss of a spouse.

“A negative state of mind has been thought to lower immunity and increase illness,” Dr. Paige said. But it is not yet known whether a decrease in immune response can lead to cancer. In some cases it may, he said. For example, the incidence of cancer increases in organ recipients who go on chronic immuno-suppression (although in many cases the immuno-suppression can be relieved and the cancer disappears).

In Dr. Paige's own lab, cancers grow in test tubes from the knee tissue of transplant patients, but only after a certain immune system cell disappears.

So, Dr. Paige asked, if stress can weaken the immune system and a weakened immune system can cause cancer, could music—which we know can have a calming effect—help reduce stress, thereby keeping the immune system strong enough to ward off cancer?

One study involved playing calming music to tumor-injected rats that had earlier been exposed to fire alarms at night. After eight days of the stress of the fire alarms, followed by the calming music, the rats showed many biological effects of increased immunity.



Could the same effect be seen in humans?

One study with breast cancer patients found that those with a higher state of “helplessness and hopelessness” had a lower survival rate (five years disease-free) than those who showed a willingness to fight. Dr. Paige noted there are many factors that affect “hopelessness and helplessness” and the study was not replicated.

Another study of breast cancer patients found that supportive, expressive environment intervention led to an 18-month survival advantage. Again, the study was not replicated when it was recently attempted at Mount Sinai Hospital in Toronto, but the patients did show very strong increases in mood, quality of life and a decrease in the perception of pain.

“It showed that the mind was affecting the body because of the intervention,” Dr. Paige said.

Chance of survival did not increase, but music’s benefits to patients should not be underestimated, he said. Music can help improve quality of life, which is part of what Toronto’s Princess Margaret Hospital means when it says its mission is to conquer cancer, he said.

**Chance of survival did not increase, but music’s benefits to patients should not be underestimated, he said. Music can help improve quality of life, which is part of what Toronto’s Princess Margaret Hospital means when it says its mission is to conquer cancer.**

“Some people interpret that to mean to cure cancer. But that’s not what it means. To conquer cancer is to live with it well until you die.”

Music therapy, he said, is one intervention that has been shown to be very important in improving quality of life and research has shown that such interventions matter. Though survival rates do not improve, the way a person lives with her disease is tremendously important, he said.

“A hospital like ours takes it seriously. We’ve got a whole psychosocial research division that we just formed and work along these lines will continue to be done. But the word, I would have to say, is still out, whether or not something like music intervention is going to have the kind of effect we’d all like to think it has in rigorous studies that can be reproduced and would become part of standard care.”

## **Music, Medicine and Fundraising**

In the final portion of the roundtable, discussion turned to how arts organizations can work with the health sector and philanthropists around the subject of music and medicine.

It should be noted that the Roundtable was unable to pursue the subject more deeply, nor discuss potential subjects for future NAC Roundtables, because participants were so engaged in discussing the morning's presentations.

Calgary philanthropist Leslie Bissett said fundraisers need to know what the end result of a piece of research will be before they can solicit a donation. Mrs. Bissett has been instrumental in initiating and supporting several projects, such as The Evelyn Burden Fund—a fund named after her mother that provides piano lessons for Durham Region (Ontario) elementary school students who would not otherwise be able to afford the luxury. Mrs. Bissett and her husband David are the lead donors to a new hospice to be built in southern Alberta.

“They need to know what is the expected outcome, and how is that going to change life, how is that going to change people's situations,” Mrs. Bissett said. “They need to be able to sell that to corporations. When you are approaching corporations, or when you are looking for funds to do that, don't forget the relevance. There needs to be some end result explained, and it has to be applicable to the masses.”

**Scientists must share their findings with arts groups in order that they may provide potential donors with strong evidence, particularly those donors who say: 'I only give to health care.'**

But Dr. Robert Zatorre of McGill University said not all scientific exploration is geared to practical applications, and that the search for knowledge must be encouraged for its own sake. He pointed to Galileo, whose discovery of the moons of Jupiter occurred during an outbreak of bubonic plague. Though that discovery did not save those dying from the plague, it was an important contribution to human knowledge, Dr. Zatorre said.

“I think sometimes what we want to do is much more fundamental than solving a specific problem. We want to achieve a greater degree of understanding. And by so doing, having that knowledge is what will actually ultimately allow the people who are doing the applied research to get much further than they would if they don't have that knowledge.”

Philanthropist Gail Asper said scientists must share their findings with arts groups in order that they may provide potential donors with strong evidence, particularly those donors who say: 'I only give to health care.'

She also told Ontario Health Promotion Minister Jim Watson that governments need to take the lead in this area.

“We, as funders to health care, could really start directing this. This would be a very fine and good, noble thing to do, to work on this aspect of health care research.”

Leonard Lee, President of Canica Design and Chairman of Lee Valley Tools and Veritas Tools, said arts groups looking for money need to come to the individual business and suggest something that they could do together, “not go to the business and say, ‘Here’s what I want you to do.’ You should adjust yourselves to their reality.”

Mr. Lee said Lee Valley Tools’ partnership with the NAC was an excellent example of a business and an arts organization working together. Last year Lee Valley Tools raised over \$45,000 for the NAC by selling NAC Orchestra CDs in-store. This year the store is selling the

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NAC Orchestra’s Beethoven CD and promoting it in its Christmas catalogue. In late November, a trio of NACO musicians played at Lee Valley Tools to promote the NAC and CD sales. The NAC benefits from the partnership because the money raised from CD sales goes toward the NAC’s youth and education activities. The partnership also helps Lee Valley Tools attract more customers—and perhaps a different kind of customer—to the store.

Dr. Ian Shugart, Assistant Deputy Minister of Health Canada, said that the day’s presentations made clear that there is both a rational and a distinctly non-rational element to health, science and music—three domains that speak to our humanness, and that are public goods in themselves. Philanthropists, businesses and governments need to understand that, he said.

“So much of what we do in creativity, in science, and much of what we do in health, of course, is not rational. But we do it because it touches our humanness in a variety of ways.”

Jean-Pierre Blais, Assistant Deputy Minister of Cultural Affairs at Canadian Heritage, said making public policy out of music and medicine is exciting but will be challenging as it fits under many umbrellas –health, arts and science.

“We in government have realized that everything gets much, much more complicated every day, that you have multi-disciplinary issues that pop up.”

Dr. Judy Beamish, Vice-President and Chief Medical Director of Sun Life Financial, said that the Roundtable showed how music can no longer be thought of as a frill. Rather, “it is part of our basic human biology,” she said. Arts organizations must take this to heart, particularly as they compete for fundraising dollars with health care organizations.

What we’ve heard today is that music is built into our brains.

“What we’ve heard today is that music is built into our brains.”

## **Conclusion**

Listening to some of the country's top scientists and doctors discuss their research and observations about how music can influence human health, learning and well-being made for a fascinating morning. Though it is an area that scientists are just beginning to comprehend, little by little and bit by tantalizing bit, the presenters of this year's NAC Roundtable showed us that the possibility for music to help healing and improve lives is real.

At the National Arts Centre, we have watched for years as audiences exit performances refreshed and renewed. Through our education work we have seen countless children and young people whose talent, when nurtured, allows them to grow as musicians and as people. Through music their sense of self and the quality of their lives have improved dramatically because of the way music has run through them.

We chose to examine music and medicine at the 2005 NAC Roundtable because we were excited by the thought that there were perhaps more ways for us to use music to reach more people and help improve even more lives. We at the National Arts Centre are re-invigorated by the Roundtable discussion to keep pursuing innovative avenues for music in the health care arena.

Though the links between music and health exist, each presenter said that much more research is required in order that more advances can be made and more knowledge gained about this compelling subject. We urge that companies, governments, corporations, as well as individuals do their part to support scientific research into this important area.

We at Canada's National Arts Centre support the presenters' quest for knowledge for the benefit of all. In the coming two years, we will eagerly prepare for two more roundtables on the link between arts and health. If this year's Roundtable was any indication, we are in for more stimulating and challenging discussions.

## **Participant List**

### **Hosts:**

Mr. Peter A. Herrndorf, President and CEO, National Arts Centre  
Mrs. Darrell Louise Gregersen, CEO, National Arts Centre Foundation

### **Opening Speakers:**

Ms. Louise T. Blouin MacBain, Chairman, Louise T. Blouin Foundation, London, U.K.  
Dr. Alan Bernstein, President, Canadian Institutes of Health Research, Ottawa, Ontario

### **Moderator:**

Mr. Don Newman, Senior Parliamentary Editor, CBC National Television

### **Special Guest:**

Mr. Pinchas Zukerman, Music Director, National Arts Centre Orchestra

### **Roundtable Sponsor:**

Sun Life Financial

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#### **Ms. Gail Asper**

Corporate Secretary  
*CanWest Global Communications*  
President  
*CanWest Global Foundation*  
Winnipeg, Manitoba

#### **Dr. Judy Beamish**

Vice-President and Chief Medical Director  
*Sun Life Financial*  
Toronto, Ontario

#### **Mrs. Leslie Bissett**

Community Philanthropist  
Calgary, Alberta

#### **Mr. Jean-Pierre Blais**

Assistant Deputy Minister, Cultural Affairs  
*Department of Canadian Heritage*  
Ottawa, Ontario

#### **Dr. Arthur Carty**

National Science Advisor  
*Privy Council Office*  
Ottawa, Ontario

#### **Dr. Richard Goldbloom**

Chancellor and Professor of Pediatrics  
*Dalhousie University*  
Halifax, Nova Scotia

#### **Ms. Dalia Gottlieb-Tanaka, M.Arch, Ph.D (c)**

Institute of Health Promotion Research  
*University of British Columbia*  
Vancouver, British Columbia

#### **Dr. Antoine Hakim**

Professor and University Chair, Neurology  
*University of Ottawa*  
CEO and Scientific Director  
*Canadian Stroke Network*  
Ottawa, Ontario

#### **Mr. Leonard Lee**

President  
*Canica Design Inc.*  
Chairman  
*Lee Valley Tools Inc. and Veritas Tools Ltd.*  
Almonte, Ontario

**Ms. Elise Orenstein**

Past Chair, Board of Directors  
*Artists' Health Centre Foundation*  
Toronto, Ontario

**Dr. Christopher Paige**

Vice President of Research  
*University Health Network,*  
*University of Toronto*  
Toronto, Ontario

**Dr. Isabelle Peretz**

Professor, Department of Psychology  
*University of Montreal*  
Co-Director  
*International Laboratory for Brain,*  
*Music and Sound Research*  
Montreal, Quebec

**Dr. Glenn Schellenberg**

Professor  
Department of Psychology  
*University of Toronto*  
Toronto, Ontario

**Mr. Ian Shugart**

Senior Assistant Deputy Minister  
*Health Canada*  
Ottawa, Ontario

**Dr. Martin Silbiger**

Chairman Elect  
*Tampa Bay Performing Arts Center*  
Professor and Chairman,  
Department of Radiology  
*USF College of Medicine and H. Lee Moffitt*  
*Cancer Center and Research Institute*  
Tampa, Florida

**Honourable Jim Watson**

Minister of Health Promotion  
*Government of Ontario*  
Toronto, Ontario

**Dr. John Wright**

Vice President, Medical Affairs  
*University Health Network*  
Associate Professor of Medicine  
*University of Toronto*  
Toronto, Ontario

**Ms. Janet Yale**

Executive Vice-president, Corporate Affairs  
*TELUS Communications*  
Ottawa, Ontario

**Dr. Robert Zatorre**

Professor and Cognitive Neuroscientist  
Montreal Neurological Institute  
*McGill University*  
Montreal, Quebec

**Agenda**

**National Arts Centre, Le Salon  
October 1, 2005**

- 8:30 a.m. Breakfast in the NAC Foyer
- 9:00 a.m. Welcome and Introductions
- Mr. Peter A. Herrndorf, President and CEO, National Arts Centre*  
*Mrs. Darrell Louise Gregersen, CEO, National Arts Centre Foundation*  
*Participants self-introduce*
- 9:15 a.m. Opening Addresses
- 1. Ms. Louise T. Blouin MacBain, Chairman, Louise T. Blouin Foundation*  
*2. Dr. Alan Bernstein, President, Canadian Institutes of Health Research*
- 9:35 a.m. Brain Imaging and Music
- *Dr. Robert Zatorre, Professor and Cognitive Neuroscientist, Montreal Neurological Institute of McGill University*
  - *Dr. Isabelle Peretz, Professor, Department of Psychology, University of Montreal and Co-Director, International Laboratory for Brain, Music and Sound Research*
- 9:50 a.m. Initial Questions
- 10:00 a.m. Roundtable Leadership Discussion: Four Hypotheses & Examples/Case Studies
- 1. Stroke and Recovery: Dr. Antoine Hakim, Professor and University Chair, Neurology, University of Ottawa; CEO and Scientific Director, Canadian Stroke Network*
  - 2. Creative Expression and Dementia: Ms. Dalia Gottlieb-Tanaka, M.Arch, Ph.D (c), Institute of Health Promotion Research, University of British Columbia*
- 10:15 a.m. Break
- 10:30 a.m. Roundtable Leadership Discussion Continues
- 3. Cognitive Development in Children: Dr. Glenn Schellenberg, Professor, Department of Psychology, University of Toronto*
  - 4. Cancer Treatment: Dr. Christopher Paige, Vice President of Research, University Health Network, University of Toronto*

- 10:45 a.m. Responses from Community Leaders
- a. Personal perspective on why this is important
  - b. How might Canada's arts organizations respond effectively and creatively to a growing understanding of the relationship between health and the arts?
  - c. What specific ideas and suggestions are there about what communities and arts organizations can do to strengthen their own organizational health through this?
- 11:30 a.m. Further Reflections, Questions and Comments From All Participants
- 11:45 a.m. *Dr. Alan Bernstein* wraps discussion from a science and medicine point of view, discusses science and composition
- 11:55 a.m. Closing Remarks: *Mr. Don Newman & Mr. Peter Herrndorf*



**Canada's National Arts Centre**

The National Arts Centre (NAC) raised its curtains for the first time in 1969. Created by the Government of Canada as a Centennial project during the 1960s, the NAC has become Canada's foremost showcase for the performing arts. Today, the NAC works with countless artists, both emerging and established, from across Canada and around the world, and collaborates with scores of other arts organizations across the country. The NAC is strongly committed to being a leader and innovator in each of the performing arts fields in which it works: classical music, English theatre, French theatre, dance, variety, and community programming. It is at the forefront of youth and educational activities, supporting programs for young and emerging artists and for young audiences, and producing resources and study materials for teachers. It is the only multidisciplinary, bilingual performing arts centre in North America, and one of the largest in the world.

**National Arts Centre Foundation**

The National Arts Centre Foundation was established in July 2000, with the mandate to raise significant financial support for artistic and educational programming by the National Arts Centre. The Foundation's mission is to inspire individuals, corporations and foundations to invest in the National Arts Centre's vision of artistic innovation, development of young talent, and creation of new works, to benefit all Canadians.

The NAC Foundation provides a full service development program for Canadians from coast to coast who wish to support the National Arts Centre, including opportunities for annual giving, major and planned gifts, special events and corporate sponsorship. A substantial portion of the Foundation's funds are raised through its National Youth and Education Trust, dedicated to reaching out to Canada's youth, wherever they live, with artistic performances, training and educational resources.

**Sun Life Financial**

Sun Life Financial has been a proud Canadian organization for more than 140 years. Since its early beginnings, Sun Life has evolved to become one of the leading names in the Canadian financial services industry, and has also grown internationally. Today the company operates a network of offices and partnerships in key markets around the world.

Sun Life has a strong focus on health-related initiatives wherever it does business, especially at home in Canada, and is also a long-standing supporter of the arts in all its forms, including musical performance. The company's sponsorship of the National Arts Centre's *Roundtable on Music and Medicine* is an opportune match for these two important commitments

Sun Life Financial is proud to help make possible this unique and unprecedented *Roundtable* – a unique “meeting of the minds” that will see leaders in medical research from all across Canada come together to explore the power and potential of music – not merely as a medium of enjoyment and enrichment, but also as a possible prescription for well-being.