Shaping the Future of Health Innovation Research in Canada:

Report on the Montreal Invitational Workshop
Held on September 27-29, 2006

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REPORT ON THE MONTREAL INVITATIONAL WORKSHOP HELD ON SEPTEMBER 27-29, 2006


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ACKNOWLEDGEMENTS

The workshop was organized through Pascale Lehoux’s Canada Research Chair on Innovation in Health. It brought together approximately twenty experts from the United Kingdom, Wales, Finland and Canada, including health services researchers, social scientists, industry representatives and decision-makers. Please see the appendix for a list of the participants and guest speakers. We are grateful to all participants for actively contributing to the discussions and sharing their expertise.

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About the authors

Stéphanie Tailliez (PhD) has been involved in a large study on the production and use of health technology assessment in Canada. She is currently examining medical specialists’ perspectives on social and scientific controversies. Dr. Tailliez is an expert in qualitative research methods and an anthropologist by training.

Pascale Lehoux (PhD) heads a research program that examines health technology assessment from a fresh perspective. Instead of looking mainly “downstream” —the traditional approach— Dr. Lehoux shifts the focus and examines “upstream” processes such as design decisions. Such factors have a significant impact on the costs of technology, the types of settings where they are used, and the skill level required to use them appropriately (www.medsp.umontreal.ca/CRCinnovations).

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SUMMARY

This report summarizes key discussions that took place during the Montreal Invitational Workshop on Innovations in Health Care held on September 27–29, 2006. The overall aim of the two-day workshop was to bring together different perspectives on health innovation. It included both Canadian and European participants. Twenty “researchers” (social scientists and health services researchers), “designers” (university-based engineers and representatives of the medical device industry) and “users” (clinicians, R&D administrators and funding agencies) shared key observations arising from their work on innovations and then discussed the implications.

The specific objectives of the workshop were to: 1) initiate dialogue between participants with diverse perspectives; 2) discuss any tensions currently perceived as obstacles to a well thought-out integration of health technology in the Canadian health care system; 3) brainstorm around potential research projects; and 4) identify ways to integrate durable knowledge-sharing practices.

During the workshop, a moderator facilitated the discussion and an observer took extensive notes. Thirteen participants gave brief presentations. The two-day agenda was structured around the following topics: 1) What makes an innovation desirable? For whom? And why? 2) What issues are encountered during the R&D process and at the adoption stage? 3) What research projects could help us better understand the issues? 4) Why should certain innovations receive more support than others?

This report briefly describes the content of the discussions and suggests a few key avenues for future health innovation policy and research initiatives. The main points to emerge were:

- Innovation processes are driven by multiple agendas that converge to varying degrees, including those of scientists, private and public R&D units, and government.
- Innovation development is shaped by market dynamics that are not always aligned with health care priorities (for example, lack of R&D for orphan conditions).
- Innovation designers need to understand the social context surrounding the diffusion and adoption of their innovations, as well as the ways in which this context could compromise innovation use (e.g., some useful technologies might not be used).
- User involvement is necessary for the design of devices to be well informed, and their design should combine simplicity and user-friendliness.
- Evaluation of innovation must evolve: it cannot be achieved solely in-house by the designers themselves.
- Social scientists should be more involved in the process of innovation design.
BRINGING TOGETHER RESEARCHERS, DESIGNERS AND USERS OF INNOVATIONS

Background

Although a few recent initiatives at the Canadian national and provincial levels (e.g., in biotechnology and nanotechnology) have emphasized the need to reconcile health care-policymaking objectives with the constraints of innovative and often risky biomedical industries, very little is known about how such reconciliation could happen and what its impact on health care would be.

This workshop was not meant to provide answers to these daunting questions, but rather to establish a trusting climate in which to explore, in depth, how innovative research could bring fresh insights to a longstanding—from the perspective of both industry and the public health care system—policy problem. On the one hand, the adoption of innovations is constrained by the need to rationalize and prioritize limited resources. On the other hand, some innovation designers feel that decision-makers do not focus enough on technologies that could benefit patients and reduce the use of other costly services. On balance, there is a lack of knowledge about what types of innovation should receive more support than others. Such knowledge would enable optimal innovation to proceed even within the context of budget constraints.

Objectives of the workshop

The workshop was hosted by the Canada Research Chair on Innovation in Health, which aims to provide interdisciplinary, empirically grounded knowledge that can deepen our understanding of both the opportunities and constraints shaping R&D (upstream processes) and the technical, clinical and organizational characteristics of technologies when they are introduced into the market (downstream processes).

The specific objectives of the workshop were to: 1) initiate a fruitful dialogue and sharing of perspectives between designers, users and innovation researchers; 2) discuss the interdependencies and tensions that are currently perceived as obstacles to a well thought-out integration of health technology in the Canadian health care system; 3) brainstorm around potential research projects focusing on the upstream challenges for innovation; and 4) identify durable knowledge-sharing practices adapted to each key group.
**Participants**

We assembled a small group of people selected on the basis of their expertise and research interests. A format was used that allowed for successive, focused discussions to take place over a two-day period. Relaxed social events (cocktail and dinner) were also organized. The goal was to foster informal discussion and avoid overly-structured interactions.

The participants (see the appendix) were drawn from the authors’ contacts and from a Web-based search of users and designers operating in Canada (British Columbia, Ontario, Quebec, Nova Scotia) and Europe (Wales, United Kingdom, Finland). The countries represented all share a commitment to publicly funded healthcare and knowledge-based economies. We invited a roughly equal number of participants in each of the three groups (users, designers, researchers). Special care was also taken to invite individuals at different career stages (recently established and mid-career investigators, Master’s and PhD candidates, senior researchers and experts).

In total, 21 individuals attended the workshop, representing three key perspectives that can be broadly categorized as: healthcare researchers (social scientists, health technology assessment producers and health services researchers), users of innovations (clinicians, R&D administrators and funding agencies) and designers of innovations (university-based engineers and representatives of the medical device industry).

**The structure of the workshop**

We created a two-day agenda by asking a number of participants to give formal presentations on specific innovations that would generate collective discussion involving all perspectives. The agenda covered four broad topics: 1) What makes an innovation valuable? For whom? And why?; 2) What issues are encountered during the R&D process and at the adoption stage?; 3) What research projects could help in understanding the issues? 4) Why should certain innovations receive more support than others? The summary of our discussions is presented according to these four topics.

Speakers’ presentations addressed a wide range of innovations: tissue engineering, medical devices, nanotechnology, rehabilitation technology, surgical innovations, telemedicine, telehomecare, genetic health services and innovative dialysis units. Key transversal issues were also examined: human factors, national innovation systems (Canada and the UK), industry challenges, and R&D policies and strategies. At the workshop, we gave participants copies of slides and briefing notes to serve as background material. A professional moderator facilitated the discussions throughout the two days, and an observer took notes during the workshop.
A SUMMARY OF THE PRESENTATIONS AND DISCUSSIONS

What makes an innovation desirable? For whom? And why?

For this first topic, four participants presented short papers: “Tissue Engineering” (Alex Faulkner), “Human Factors and the Design of Safer Medical Devices” (Tony Easty), “Nanotechnology” (Bryn Williams-Jones), and “Rehabilitation Technology” (Alex Mihailidis).

In the first presentation, Alex Faulkner explained that tissue engineering is still emerging and that few products are currently being used in the health care system. It is a new field, a new science, and a combination of new technologies. While there are many small and medium-sized enterprises (SMEs), there is a lack of stable business models. Furthermore, the development of these new technologies has raised the issue of cost-effectiveness, not to mention the ethical implications: for example, the informed consent of patients and what information about the products themselves will be provided to health professionals. Furthermore, there is not yet any regulation of tissue engineering in Europe. Thus, new forms of evidence are required.

In his presentation, Tony Easty explained that Human Factor Evaluation is needed for every innovation in order to eliminate the misuse, even unsafe use, of new technologies. He noted that the formative evaluation of medical devices is very important as designers need feedback to improve the next generation of devices. Human factor evaluation can also improve the adoption of technology as efficient designs decrease the training requirements for health professionals. To be more efficient and safer, devices need to be simpler.

Participants opened the discussion about device design and evaluation by highlighting the problems encountered by health professionals in adopting new devices—for example, devices with too many features. Participants weighed the pros and cons of typical “in-house” testing. On balance, this was deemed inappropriate, as the designers of devices are usually not the end-users. The participants underlined the fact that feedback from the end-users of health devices is rarely sought during the design process. The adoption of innovation would be improved if designers recognized the need to seek users’ feedback and then acted on this information. Still, more than just the actions of individual innovators is needed to smooth the adoption of innovation. The participants highlighted the challenge presented by the existing diversity in medical device developers and the need to harmonize practices among major users like hospitals. Finally, participants pointed out that regulatory bodies, industry and users all bring their own agendas to the task of fostering innovation development and uptake.

Bryn Williams-Jones talked about nanotechnologies. He argued that the general public is not very interested in the subject, a challenge exacerbated by the highly variable public understanding of science. In addition, nanotechnology is a “boundary-crossing” technology—it is not one “thing”, or even limited to one sector. This non-specificity creates enormous challenges for evaluation and regulation: How do we evaluate nanotechnologies? Who should regulate them (i.e., which governmental department—health,
industry or agriculture)? This requires a more complex analysis of technology than would at first be envisioned. Further, regulatory processes face considerable uncertainty regarding the future of nanotechnologies.

In his presentation on rehabilitation technologies, Alex Mihailidis provided a definition of rehabilitation and assistive technologies (AT), arguing that there are many different technologies on the market (organizers, voice reminders, wheelchairs, etc.). He highlighted some of the problems with AT. First, AT design does not generally consider the user's individual context or specific environmental factors. For instance, users complain that AT devices are too difficult to learn to operate and thus too frustrating to use. Second, AT devices do not perform the precise function the person desires. Finally, AT devices involve stigma: they are typically ugly and their use signifies a disabled, less empowered state of being that is widely under-valued. These challenges may become even more pressing now that artificial intelligence is being combined with AT to produce devices that can more actively impose themselves on users. Given what we already know about the non-responsiveness of AT devices to users' desires, the addition of intelligence to these designs raises challenging ethical and social questions. Where and when might this technology be appropriate? How can we educate potential users about these systems?

In light of these two talks, participants discussed the fact that innovation is driven by, and sometimes limited by, the market. Some devices do not change much because people do not need them to change and will not pay for such change, even though many improvements are possible (wheelchairs, for example). The question of stigma is very important. If people do not want to be labelled as “disabled,” this will further reduce the uptake of AT devices and limit the innovation potential in needed areas. Ultimately, some innovations need a champion to promote them.

Regarding nanotechnologies, participants discussed the “hype” factor and its role in driving or impeding innovation. The media disseminate the news about innovation, and technologies may create overly high public expectations. With all of the hype and hope generated, how can innovators translate innovation into real-world results? How can over-promotion and unfulfilled promises be avoided?

What issues are encountered during the R&D process and at the adoption stage?

Four presentations addressed the second general topic: “Shaping the UK System of Innovation” (Chris Henshall), “The Canadian Medical Device Industry’s Challenges” (Stephen Dibert), “How do Surgeons Innovate?” (David Urbach), and “The Ontario HTx Initiative to Support R&D” (Jennifer Woods).

In his presentation, Chris Henshall gave a portrait of R&D in the European Union and the United Kingdom. He described how the United Kingdom has recently started to focus more on health technology and the device industry. It has defined its objectives as developing collaboration between business and the science base, and as promoting innovation in businesses directly (HM Treasury, 2004). A successful innovation is one that delivers something customers value. The health professional is often seen as the customer, and cost-effectiveness is often perceived as the enemy. And “if the customer is seen as the
health care system, there are many exciting opportunities to apply new technologies, and new combinations of technologies, to deliver desired outcomes in efficient and patient-friendly ways."

Stephen Dibert talked about MEDEC, a national association created by the Canadian medical device industry. In Canada, this industry represents approximately 120 companies, a majority of which are SMEs, and 35,000 employees. In terms of market share, however, Canada represents only 2% of the global market for devices. Thus, the return on investment is low here, and domestic sales are not significant, which curtails Canada’s influence in the marketplace and reduces its ability to attract business from around the world. He said that Canada is lagging behind in terms of innovation adoption because of many factors: the funding model, reimbursement decisions, the HTA sector (different agencies with different processes in Canada), the product-standardization process, a lack of action, and societal indifference (willing to wait / prefer less expensive generics).

David Urbach then explained how there is no linear pathway to innovation and no formal adoption process for surgical innovations. He observes a lack of regulation in general: a lack of evidence of safety and effectiveness, a lack of sufficient informed consent, a lack of standardization for the introduction of new techniques, and a lack of evidence-based adoption.

Jennifer Woods presented HTX and its initiative to support R&D in Canada. HTX is a government-funded program that aims to accelerate the development of medical devices and AT. Through R&D programs and information exchange, it assists SMEs through the whole continuum—applied research, product evaluation, commercialization and company creation.

Several questions emerged from the above discussions. First, "who is the customer?" This question was asked repeatedly, yet never completely answered. Traditionally, the physician has been the customer, but now patients and relatives are often targeted. Should R&D spending go to the areas of greatest therapeutic need, in terms of numbers? Perhaps research grants should be tied in with identified needs in the health care system. How can the health care procurement system motivate innovation in healthcare?

Some participants raised the issue of R&D funding, noting that finding money for research is difficult. Innovation in Canada is not very interesting financially: tax breaks are short-lived and unpredictable. Companies sometimes move operations from one country to another in a bid to raise profits. Investors in Canada need to be committed and the investment needs to be long term. The market is highly competitive, and the buyers of technology base their decisions on cost, not quality. Finally, this is a field dominated by SMEs and some trust issues could potentially develop.

What research projects could help us understand the issues?

Three presentations addressed this third question: "How Much Does Evidence Matter: HTA and Telemedicine in the UK" (Carl May), "Research in Pediatric Rehabilitation Engineering" (Jorge Silva), and "Studying Genetic Health Services ‘upstream’" (Fiona Miller).
Carl May described the collision that occurs between the promises of new technologies and actual service delivery. He raised the issue of the role of evidence, which in medicine is usually randomized controlled trials (RCTs). These often take six to nine years, while telemedicine applications become obsolete in two and a half years. The question is: How can the stumbling block of evidence-based science be removed to enable the development of telemedicine? How can evidence-based medicine move from long, complicated trials to the needs of a patient population with complex problems.

Jorge Silva explained that the Canadian government gives a global funding envelope for medical research but does not identify any priorities. Innovation is what is publishable, and government, universities and researchers have different agendas. There is a problem in the allocation and use of resources. Community members are not taking part in the generation or development of innovations. Some technologies remain unchanged over time; for example, the arm prosthesis design has changed very little since 1965 although other possibilities would be technically feasible.

Fiona Miller argued that health innovations such as genetic technologies have complex effects on policy, practice and experience that diminish the utility of service implementation research for policy analysis. Upstream (i.e., design) or midstream (i.e., research-service interface) research can remediate some of the challenges, but core policy analytic problems remain (e.g., need for timeliness, context insight, limited role of evidence in policy development).

During the discussions, the participants stressed that more attention should be given to context. Innovations can encounter consumer resistance. For example, the cochlear implant encountered clear resistance within the deaf community and some (deaf) parents did not want it for their children. All stakeholders in the community need to be involved in the process of adjusting the technology. Technology must be interactive and adaptive, and innovators need to understand why a technology is or is not adopted. Some technologies are adopted more rapidly than others. For example, cataract surgery was adopted quickly because it is minimally invasive and profitable for physicians.

There are good and bad reasons to adopt/not adopt a new technology. It is a matter of what is desirable. So we can ask: What would be desirable? Development of innovation is shaped by the market. Questions regarding orphan conditions and innovation were raised: Should the government support the development of orphan technologies? Also, why do some technologies change every two years while other ones do not? Should innovation be designed for people with disabilities or for people in general (i.e., universal design)?

Why should certain innovations receive more support than others?

Two presentations were made in the fourth and final session: “Tele-Homecare in Finland” (Samps Hyysalo) and “Comparing Satellite and Mobile Dialysis Units” (Pascale Lehoux).

Samps Hyysalo explained that in the literature, the emphasis is on the interaction between design and use and on learning. The innovation process is very long and involves social learning,
including partial rejection, re-design and adapting to users. User involvement is necessary in design. Innovation often happens by mixing other devices, processes and innovations together. However, some innovations are not “hyped” enough: they do not involve nanotechnology or genetics. The problem is to connect downstream and upstream. “Innovations are not born, they are made.”

Pascale Lehoux summarized a study that assessed the benefits and limitations of two health care delivery models for dialysis services. The views of health professionals and patients were collected through interviews and observations. She examined the claims made by professionals about the innovativeness of the models. Within the satellite unit: 1) “localness” was valued; 2) local nurses had a “mother-to-child” relationship with the nephrologists at the regional hospital; and 3) nurses were not asked to outperform. Within the mobile unit: 1) the procedure was said to be for the patient's good; 2) only the “best” (i.e., autonomous) nurses were recruited; and 3) a highly regulated and formalized practice was valued. In both projects, patients were satisfied with the care and they did not feel the need to be physically close to nephrologists. Both models strongly relied on a re-division of clinical tasks. Professional micro-struggles were pervasive, with the satellite units remaining a doctor-driven project and the mobile unit a nurse-driven one.

In the discussion, some participants suggested that we focus too much on technological innovation. They pointed out that soft components (knowledge, processes, skills) are key components that need to be looked at more, and that innovation can be social innovation, which is as important as technological innovation. There is also too much emphasis on economic issues. In Canada, every province is different and there are a large number of administrative bodies because of how the system is structured. For some, the administrative complexity stifles innovation.

Although competition drives innovation, it can also be harmful and slow down innovation. In certain areas improving innovation management is a complex task: you have to stimulate competition and force collaboration. Innovation depends on people who want to do things in a different way. How do we create a culture where people look for new ways of doing things when they come to work? Finding ways to encourage people to think creatively is a challenge. Furthermore, researchers tend to be attracted by “hot” topics that bring in the grant money. There is no system for controlled clinical trials to evaluate new device technology. We also need to develop alternate forms of evidence (i.e. qualitative) of safety and effectiveness. The impact of drugs and/or technologies would be different depending on the context, country, the health care system.

At what point does innovation become useless and simply replicate inefficient applications? Innovation calls for technological innovations. It is laudable if part of the budget is devoted to developing innovation within the system. But there are no incentives to reinvent the health care system. Some participants believed that the patenting system needs to be reinvented, and that we need to have incentives for companies to create new drugs for the global population, not just for people in developed countries.
The limits of the cost-effectiveness approach were also discussed. Market laws do not apply fully in health contexts, and the social dimension is equally important. Cost-effectiveness is not always the best evidence to use when assessing the value of an innovation. Better tools could be developed and they are greatly needed.

We need to expand the concept of evidence. Some participants felt that social sciences such as sociology have a role to play. Social scientists should be more involved in facilitating the introduction of health innovation: they could help innovation designers better understand the real-life context. Qualitative research may bring new evidence—evidence that is not only about costs and efficacy.

**DISCUSSION:**

**KEY CHALLENGES IN HEALTH INNOVATION RESEARCH AND POLICY**

The discussions and presentations that took place during the workshop allowed participants from various fields to express their views on health innovations and to give a more accurate portrait of their fields. Emerging from these discussions were three general issues that we believe can help pave the way for future policy and research initiatives.

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**Design processes: the way context and various agendas drive the development of health innovations**

Significant players in R&D are researchers and industry in both the private and public sectors. Some workshop participants described how various agendas drive health innovation and R&D. First, researchers need funding to keep their work going. And what attracts funds? The new “hot” technologies: nanotechnology, genetics, genomics, stem cells and information access via PDAs (personal digital assistants). Researchers working on these technologies are more likely to obtain funding (Caulfield 2004). These technologies also receive more media coverage, which brings more attention to the research institutions. Researchers also attach importance to publications in peer-reviewed journals so another criteria for choosing research topics is publishability. According to some researchers, some important issues end up being sidelined.

Do R&D niches match health care system needs? Industry will develop innovations for which there is a market. Some participants at the workshop also noted that some technologies change every two years while others remain the same for decades. Again, the explanation given was market dynamics. Why would a company invest in R&D when the product they manufacture is in demand and sales are good? The example given was wheelchairs. Their shape and functionality has not changed, perhaps because people will always need them even though their design remains questionable.

Competition also shapes design improvement. For some, competition is the key to innovation, and stimulating innovation in-house can be a difficult task. Competition can also be harmful, leading to multiple devices with the same purpose and contributing to the over-diversification and replication of products. For
example, the multiplication of resuscitation devices means more training for health professionals so they can master the use of the many different devices. Furthermore, switching from one device to another can be confusing and lead to errors.

With industry driving the research agenda, it is users that have to adapt to the new technologies. As stressed by Morgan, “instead of the software adjusting to the needs of the customer, the customer is forced to change his practices to adapt to the software” (Morgan 2006:199). A common sales strategy of industry is to produce a device for a large market—a universal device with a range of features. However, such a device may compromise patient safety. Trying to meet the needs of a diversity of health care professionals with one device can be problematic: operating the device can be difficult and stressful, and even endanger patients. Some existing devices or procedures need to be rethought, and more standardization is required (Buckle et al 2006). When creating a device or a tool, designers need to better understand the factors that affect its use and the context in which it will be used.

To make the orphan conditions attractive to innovators and industry, some patient associations have resorted to using a “champion” to head their attack in the R&D battle. The aim is to increase visibility and improve the chances of receiving research funding. An example often given is Christopher Reeve, who was an advocate for spinal cord injury research and stem cell research.

What is the government’s role in setting R&D priorities? Who decides what is the next “big thing”? If greater importance is given to “hot” topics and/or studies, others will be left out (i.e., orphan diseases and/or conditions).

Who is the client? What role can users play in the innovation process?

With innovation comes the “client question”: For whom are innovations designed? The answer to this question varies with the technology. The client can be the health care professional, the patient (the public) or the health care system. However, the main customer has usually been the health care professional. The feedback of users is often sought, but not at all stages of the process and not from a large range of users. They could be more involved during the design and deployment phases. Involving users in research can be beneficial for both organizations and industry: “[they] can encourage research questions to include social and emotional aspects of health [that are] frequently missing from professionally led research” (Boote et al 2002:220).

The whole area of technology design needs to be carefully examined. Some denounce the fact that technologies are designed by engineers who do not need or use them. Consequently, there is a gap between the solutions devised by industry and the needs of end-users. Workshop participants gave the examples of technical aids and cochlear implants. Technical aids design does not change because users are captive—they need them and will buy what is available. Also, designers do not use them and may not think about useful new features. Regarding the cochlear implant for deaf persons, the designers failed to
take into account the “deaf culture.” Indeed, part of the deaf community refuses to use the cochlear implant.

Poor design has a consequence: resistance to adopting a new technology. The implementation of new technologies is a very important step, one that is often given short shrift by organizations. This lack of involvement and interest in the implementation (dissemination) of new technologies/procedures can also lead to resistance. We need to understand how an organization works in order to better implement an innovation. “While industry is focused on market share, profit margins, and competition-driven engineering, quality health-care providers and their knowledge workers are interested in customized solutions, optimized workflows, and “data-driven engineering”. The result of these misaligned priorities is a gap between what the generalized solutions industry is willing to provide and the optimized solutions health-care providers want—a value innovation gap. Those experiencing this gap have a nagging frustration that the end-users are not driving the process” (Morgan et al 2006:197).

Indeed, innovation can spread slowly. Some authors believe that we need to create an environment for change, adoption and reinvention if we want to improve the dissemination of innovation (Berwick 2003). Early adopters of innovation and champions are facilitators for the dissemination of innovation. Others believe that designers need to better understand context and the factors that can contribute to errors (Buckle et al 2006). There needs to be more frequent interaction between designers, industry and users in order to avoid errors, as well as improved knowledge about systems, processes and tasks to design better (safer) technologies.

Social context and ethical issues: deciding what is best, and for whom?

With health innovation comes ethical questions concerning not only publicly controversial topics (such as stem cell research and screening tests), but also more general issues about access to health services and health innovations. Health innovations are often made in developed countries, for developed countries. However, some authors have pointed out that some medications have now become too expensive even for people in developed countries. And access to generic medications can also be difficult in developing countries for certain segments of the population. According to Dentico and Ford (2005), the current patent system stimulates innovation “only where the industry sees the opportunity for increasing sales.” They advocate a new R&D treaty that would foster innovation and international collaboration. Industry generally develops new technologies that will benefit the greatest number of people (those who can afford the technology). But what about developing drugs for countries that cannot afford them?

What should prevail? Cost? Cost-effectiveness? Relief for the greatest number? Relief for the fewest with the greatest disabilities? Who or what should identify priorities in health innovations? It seems that ethical questions are being raised during the implementation period, but not addressed sufficiently at the design stage.
Regarding the social context, one workshop participant pointed out the stigma attached to certain technologies (e.g., oxygen therapy), as well as the label "disabled" attached to certain conditions. Designers should take this aspect into account and try to reduce the stigma. Finally, workshop participants urged innovators to be careful about giving too much hope to the population. They need to strike the right balance between hope and realism.

**CONCLUSION**

The workshop provided a unique and rich forum in which diverse views could be shared collegially. It addressed a topical issue that requires creative thinking, mutually enriching learning processes, and a broad, long-term outlook. Most participants agreed that the time was ripe to organize such an event. They found the workshop somewhat unconventional but definitely fruitful. A scholarly paper that outlines a framework to reconcile the innovation policy and research agendas is in preparation (Lehoux et al., in preparation).

Several questions remain unanswered and could pave the way for further research. Are there risks of collusion between researchers, physicians and industry? How can the public become more involved in innovation processes? Does the public care? In what ways do they care? The regulation of innovation and its impact on creativity is a matter of debate. Is it possible to identify early on the most promising innovations and adjust R&D funding accordingly? Are all therapeutic areas attractive to innovators? Can unconventional technologies (e.g., tissue engineering, nanotechnologies) be assessed by established evaluation processes? What criteria should be used?

In closing, we leave you with the following key points that emerged from our discussions:

- Innovation processes are driven by multiple agendas that converge to varying degrees, including those of scientists, private and public R&D units, and government.
- Innovation development is shaped by market dynamics that are not always aligned with health care priorities. Specific efforts should be made to ensure that innovations serve needs.
- Innovation designers need to understand the social context surrounding the diffusion and adoption of their innovations, as well as the ways in which this context could compromise innovation use (e.g., some useful technologies might not be used).
- User involvement is necessary for the design of devices to be well informed, and design should combine simplicity and user-friendliness.
- The evaluation of innovation must evolve and combine quantitative and qualitative approaches. It cannot be achieved solely in-house by the designers themselves.
- Social scientists should be more involved in the process of innovation design.
APPENDIX: LIST OF PARTICIPANTS AND SPEAKERS

SPEAKERS:
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