**Applying transdisciplinarity to the complexity of work disability prevention**

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## Introduction

As work is a survival need for most human beings and a highly ranked value in many societies, work disability is a tragedy that has been generally misinterpreted for centuries. Those who were not able to work were formerly dependant of family support or public charity whose modern expression in many countries is government welfare. The modern trend to help work disabled people has been financial compensation of wages, at a level that may considerably vary from a country or state to another, but this financial compensation does not compensate for the loss of feeling of being useful and the social role of being a worker. The Québec poet Félix Leclerc has written that "the best way to kill a man is to pay him for doing nothing". Work disability is not only an individual problem, it is also an economic burden and modern societies spill an important part of their resources to pay for the consequences of this problem. As an example, Van Tulder et al have shown that, in The Netherlands, the costs of back pain correspond to 1.7% of the gross national product of the country and that as much as 93% of these costs are linked to disability from back pain (van Tulder, Koes and Bouter, 1995). Although the burden of work disability is substantial, a large part is preventable and could be avoided through management changes that bring together the various multiple actors involved in the work disability process; there stay the need for transdisciplinary (TD) action.

## Modern facts on work disability prevention

Until recently, when someone declared that he/she was unable to work due to a disease or an accident, it was thought that by directly addressing and curing the disorder the disability would disappear and normal work might be resumed. The cases of failure of this approach were considered or very severe and leading to definitive work disability or symptom amplification or even malingering. Recent research has shown a very different picture. In fact, epidemiological studies have shown that the largest part of the disability was explained by determinants not related to the original medical disorder (Turner, Franklin and Turk, 2000; Waddell, Burton and Main, 2003). Instead, they were related to psychosocial and environmental factors such as fears of the condition, difficulties encountered in the workplace or failure of the stakeholders in the work disability problem to have a common attitude towards the management of the disability episode (Frank et al., 1998). This means that the classical biomedical model explaining a disease becomes ineffective to explain the disability process. This has led to the development of biopsychosocial models (Waddell, 1992) and even person-environment models (Loisel et al., 2001). These models bring a new approach and allow to consider the evolution of the

disability process in a similar way for various disorders (musculoskeletal, mental health, etc.) and to look for the causes and solutions not only close to the person but also to his/her environment (workplace, healthcare, compensation system).

This means that we are facing a new paradigm explaining the work disability problem, not directly linked to a disease, but becoming by itself a kind of new disease with personal, social and environmental determinants. As the causes of the disability are diverse and linked to different social structures or organisations, they have to be addressed in such diversity. We have developed a conceptual model in the fig 1, showing that the disability may come from determinants existing at different levels of the personal (individual) system of the disabled person and/or the workplace system, the insurance system and the healthcare system itself.

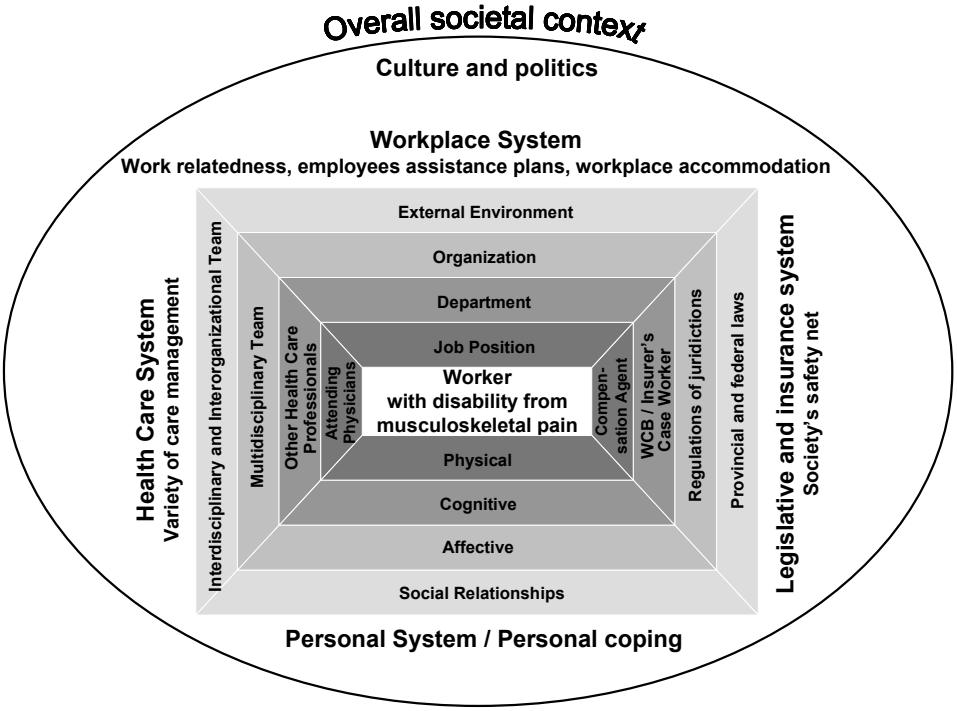


**Figure 1: The arena in work disability prevention**
(figure adapted from Loisel et al (2001))

From this new paradigm perspective, TD naturally emerges as a necessary medium to find solutions. Referring to Nicolescu's description of levels of reality (Nicolescu, 2002), we may observe that in the social world of work disability we also encounter different organizational worlds that are ruled by different laws, regulations, interests, culture. For these reasons, they obey to different logics leading to decisions that are often contradictory and play a large part in maintaining and even enhancing the disability process. This appears to represent different levels of reality, acting in different worlds and applying their different logic to the same person who is as well a worker and a patient. For example, the following logics apply after a work accident:

Logic A: From the healthcare provider perspective (HCP), the disability is caused by a medical problem (e.g.: back pain) and good practice may appear as exploring in depth the possible causes of back pain (even if they do not really explain the resulting disability). For these reasons, the attending physician may prescribe sophisticated tests and consultations to specialists, with the result of inducing fear of a severe disease in the worker's mind (a cause for prolonged disability).

Logic B: From the workplace perspective, the disability has for result productivity loss, job disorganisation and supplementary costs. For these reasons, the logic of the workplace is to maintain productivity in order to maintain the profits. Workplace management will take action in this way (may be appeal of the case, firing the "problematic" worker, etc.) and not for the best of the return to work and health resumption.

Logic C: From the insurer perspective, work absence is a damage to be addressed at minimal cost in order to close the file as soon as possible. For these reasons, the insurer's logic is to look at the simplest solution in order to strictly respond to their insurance contract and to applying laws and regulations (may be contesting the diagnosis, give a lump sum, etc.) and not for the best of the return to work and health resumption.

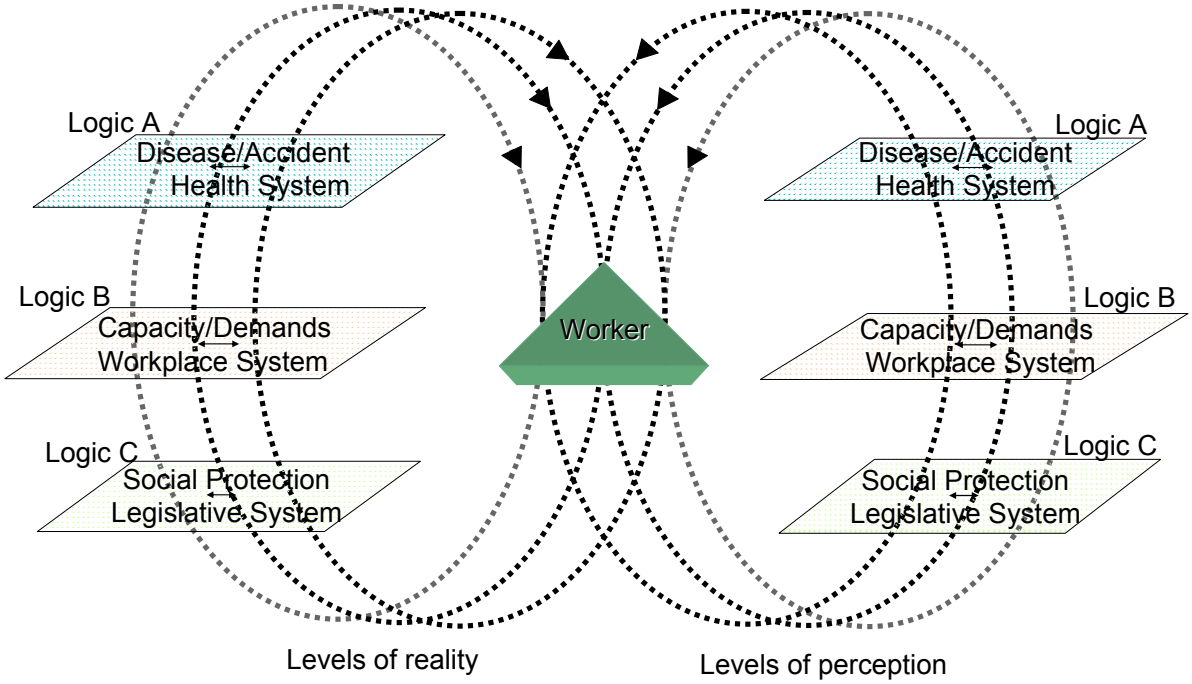


**Figure 2: Levels of reality involved in work disability**
(figure Adapted from Nicolescu and translated from Loisel et al (2005b))

There are also other logics. Often, when a case of disability does not correspond to a very visible lesion (e.g. amputation), but to a less visible disorder, (e.g. back pain, burn out), suspicion arise from the stakeholders and even from the co-workers, family or relatives. The usual logic of confidence towards the worker may be opposed to a logic of suspicion

that may result to a supplementary isolation of the worker and prolongs the disability (St-Arnaud, Saint-Jean and Damasse, 2004). Modern research on persistent pain has shown that negative attitudes and feelings have a biological influence in the nervous system that enhances the pain experience (Vlaeyen, Kole-Snijders, Boeren and van Eek, 1995).

From all these logics, it is easy to perceive that the worker will face, for his/her same disability problem, several explanations, attitudes and actions that will confuse him/her. One important disability determinant is precisely the lack of communication and coherence of actions between the stakeholders in the disability problem. Some cases, looking desperate, have been solved by very simple solutions, when all the stakeholders have been brought on side. You can see an example from a real case that has been summarized in a cartoon (Annex A) and will be discussed below.

## TD action in work disability prevention (WDP)

As soon as we had grasped the complexity of work disability, we understood that a single discipline could not be able to bring alone the appropriate answers. This explains why we have gathered a TD research, clinical and training team in order to further research, address and teach the work disability problem following a TD way.

### 1- Researching work disability in a TD way

Our first step was to build in 1990 a large project for the management of back pain. This study was implemented in 31 workplaces in the Sherbrooke (Québec, Canada) area (Loisel et al., 1997). For the first time, we compared an ergonomic intervention to a clinical intervention in a randomized controlled trial. The ergonomic intervention was effective on earlier return to work and better quality of life and the clinical intervention was not. Costs savings for the insurer were considerable after a follow-up of six years (Loisel et al., 2002). In order to design and run the study, we gathered a first interdisciplinary team: orthopaedic surgeon occupational physician, ergonomist, occupational therapist, kinesiologist, psychologist, epidemiologist and statistician. Moreover, the study was supervised by a board joining to the researchers, employers', unions´ and insurer's representatives.

Following this study, we built a TD research team that has been funded by the Fonds de recherche en santé du Québec (FRSQ), the Québec funding agency for health research. By now, this team includes 14 members, issued from 5 universities, addressing the work disability problem following a TD perspective. These researchers are issued from many different disciplines: anthropology, biomechanics, ergonomics, ethics, industrial engineering, kinesiology, law, medicine, neuropsychology, occupational therapy and psychology.

In 2001, we published a position paper defining the new paradigm of WDP (Loisel et al., 2001). We meet every six weeks and share our experiences, projects and perspectives. All research projects include several researchers, as required to answer the proposed research

question. We are really amazed to see the connexions that usually arise from our discussions leading to fruitful associations between researchers that you would not have expected even ever meeting together. Most of these researchers assiduously attend the meetings, showing their sustained interest and bring their graduate students who are trained with this TD perspective. However, we have observed that conditions are required in order to have successful research actions in such a TD research team. First, new members have to be accepted by the whole team after they have at least made a presentation of their work, followed by interactions with the team members. In my view, two major conditions are required before inviting someone to be part of the team: high competence in the discipline with major interest in WDP and ability to pursue team work. This corresponds to the qualities required from someone engaging in TD work and named in the TD charter: rigor, openness and tolerance. The following excerpt is a free translation of an article published in the journal PISTE (Durand, 2002).

> However, gathering all the experts does not create transdisciplinarity, i.e. a close collaboration in the integrated analysis of a same object. According to Mercier-Gouin (1981), transdisciplinarity is above all an individual practice which cannot be learned nor taught, but which is lived. So, in order for our team to live transdisciplinarity, it was necessary at first to establish a common vision of handicap prevention situations in the workplace and to agree on the same frame of reference where each discipline could fit-in and create interfaces with the others. At first, each member of the group arrived with an extremely specific but split vision of the problem. We decided to meet to discuss Fougeyrollas's (1996) conceptual frame of handicap production. Fougeyrollas illustrates the handicap situation as an achievement or not of a life habit, i.e. a current activity or a social role that insures a person's survival and fulfillment in society throughout his/her existence. Achievement of a life habit is a direct result of the interaction between an individual's disorder and disability level on the one hand, and environmental factors on the other hand. The work related handicap situation is thus defined as the result of an unfavourable interaction between a musculoskeletal deficiency which involves a loss of capacity to carry out certain tasks, and environmental obstacles including the work environment, the administrative compensation system and even sometimes the health system. This negative interaction may prevent the worker from returning to normal life habits, which in this context is work. Consequently, returning to life's daily routine is possible only if there is improvement in the abilities and reduction of the environmental obstacles. Thus, the simplified medical vision is rejected when considering the environmental factors such as legislation, work requirements and professional relationships. This common vision was attained after several meetings and exchanges where each researcher presented part of his/her work.
>
> The challenge was to make disciplinary works intelligible to an interdisciplinary public and to welcome other researchers' viewpoints. This exposure was an occasion to create a link as well as interfaces between the various disciplines and develop research projects in a more coherent manner that would correspond to a common representation of the work disability situation.

Thus, during the first two years, the team met approximately once every six weeks and each member presented a research project under development or that he/she was currently working on. Also, graduate students matched to team members and research professionals were invited to present or take part in the discussion. To expose oneself to others requires what Gadamer (1996) described as a *docta ignorantia*, which means that it is necessary to initially recognize your own ignorance in order to be able to properly listen to others.

This type of interaction between individuals is only possible if a true dialogue is established. This requires that interlocutors share a certain number of common definitions in order to establish a basis for their interactions (Gadamer, 1996). It is also necessary that each individual listen to one another, i.e. to hear the other's point of view with respect to it being different from yours, and answer him/her by taking into consideration the opinion expressed (Giri, 2002). This is considered being attentive and vigilant towards others.

During the first two years of the team's existence, its energies and activities were concentrated on building towards this common vision. This was possible because members accepted to share power, demonstrated curiosity and were not led into individual or disciplinary takeover nor in aggressiveness. Preserving this attitude was a challenge at each meeting but it created a solid basis for relational dynamics which must continuously be encouraged. According to Giri (2002), this type of work requires perfecting the art of distancing oneself and having the courage to abandon the comfort of his/her own discipline in order to be open and explore a more universal vision of the research object.
This openness towards the comprehension of others' vision proved sometimes hard and exhausting for certain members. Indeed, doing it proved that it does take time. Also, the majority of the team's researchers had to answer to high level productivity requirements from their respective university or research institute that were conflicting with the time consuming task of developing a common conceptual framework and establishing a common vision. At present, the organizations accept traditional research products such as scientific writings, but grant little or no importance to the work of pioneers who, in the short run, cannot bring forth an integrated activity.

Thus, the work of our team oscillated between "*cross",* "inter" and "trans"disciplinarity depending on the members' participation and their constraints. Progressively, after several exchanges and meetings, the group seemed to tend towards transdisciplinarity. However, over the years, certain participants have questioned this direction and are leaning back to "intra"disciplinarity as it seemed more efficient and coherent with the short-term visions of their organizations. This oscillation between "intra", *cross*, "inter" and transdisciplinarity can also correspond to an alliance's life cycle.

This cycle of innovation and change, described by Jacob (2001), is comprised of three important stages: getting used and engaged to team work, being disappointed but able to adapt and, finally, consolidation. The team went through the three stages with questionings and organisational paradoxes, but also with the satisfaction of sensing an opening towards complexity and of bridging towards other disciplines. Gradually, this task of sharing and building towards a common vision definitely modified our comprehension of the problem; it is now impossible for us to ignore the contributions of other disciplines any longer.

One less obvious repercussion from this activity is that each team participant becomes an agent of change in his own milieu and thus contributes to propagate a more complex vision and, particularly in our field, a more systemic vision of work disability. Whereas funding agencies lean towards the development of interdisciplinarity in research by requiring it as a criteria for project proposals, our experience enables us to express certain reservations on the true effectiveness of this strategy.

Indeed, although researchers combine their efforts to obtain funds and consequently to increase the number of exchanges, in the short run, this alliance will not necessarily result in the development of a common and integrated vision of a research object. As mentioned previously, it is the nature of the research object as well as the researchers' choice that dictate the meaning of common work and this may lead to interdisciplinarity instead of true transdisciplinarity. Alliances between individuals rest on the basis of mutual exchanges where each partner should gain something. In the present research context, it seems that interdisciplinarity is more often encouraged than transdisciplinarity, even if the conceptual leap brought by transdisciplinarity is much more promising.

## 2- Addressing work disability in a TD way

Addressing work disability directly (instead of addressing it though a disease) is very far from common practice. Healthcare providers (HCPs) have disciplinary knowledge and keep on addressing directly the disease and consequently miss most of the determinants of the disability problem. One illustration is the story described in the attached cartoon (Annex A): when giving a severe diagnosis, the physician has accentuated the worker's fears, as the medical system is the most trusted level of reality for a patient anxious to fix his health problem. Then, the inability of the medical system to solve the problem perceived by the patient (pain in the foot) has led him to be in despair of his condition (reinforcing the pain experience through biological mechanisms (Vlaeyen et al., 1995)) leading him to inactivity, social withdrawal and fear of losing his job. Also, the employer was unaware that the worker's real problem was fear of disability and consecutive lack of job for a "handicapped" worker. As a result, the patient / worker faces the level of reality of the workplace not competent to solve medical problems and the level of reality of the medical system not equipped to recognize and solve psycho-social problems. Facing this double level of reality and logic of action reinforces the worker's fears and perception of

mistrust and prolongs the disability. In most countries, little information flows between these levels of reality for many reasons, practical, financial and even ethical. Some of them are: busy practice of doctors allowing little time for patient's reassurance and communication with employers; different values of these stakeholders (healing vs. maintaining productivity); protection of patient information limiting transit of information from treating physicians to occupational physicians; payment for medical and not for occupational interventions. The successful intervention of the rehabilitation team was due to its TD nature allowing recognizing the discrepancy between the two levels of reality (workplace and medical system) and establishing the communication by allowing circulation of information. Bringing together in a same team a physician, an occupational therapist, an ergonomist, a kinesiologist and a psychologist, sharing the same common disability paradigm, vision of safe and sustainable RTW and work rehabilitation values (Loisel et al., 2005c) has allowed to bridge the levels of reality, to explain the reality of the situation to the worker, the employer and the physician in their own language. This has led to worker's reassurance, return to fitness and appropriate recognition by his employer with the consequence of immediate return to work and resumption of his worker's role. The solution was in fact very simple, but required a TD approach of the problem.

Through the described example, one may see again that the problem of work disability by itself calls for TD. We are aware of multiple similar cases becoming definitely "chronic", losing employment, divorcing, requiring welfare, because they "fall" between two levels of reality and they are crushed by a system that is inappropriate for their case (Baril, Martin, Massicotte and Lapointe, 1994). The problem is that, even if this is more and more recognized at a scientific level, solutions are very difficult to implement, due to the structure of the social system and resistances to bring accommodations for the work disability problem (Loisel et al., accepted). An example is the story of the Réseau en réadaptation au travail du Québec (RRTQ) (Loisel and Labelle, accepted). The RRTQ, developed in 1999, was a consortium between public rehabilitation centres in the province of Québec, in order to disseminate such TD teams for WDP and rehabilitation. This project was first accepted and funded by the Board of Governors of the Quebec public insurer for work disability (CSST). At the beginning of the network, a large educational effort had been undertaken close to the clinicians and administrators of the centres to bring them the latest evidence in WDP as well as principles and practice of working in a TD way with the stakeholders from the other levels of reality. A tool previously developed and tested by the initial rehabilitation team (WoDDI) was explained and given to the other teams (Durand, Loisel, Hong and Charpentier, 2002). After some initial difficulties and role clarification, this part of the implementation inside the centres was a success with common commitment, sense of belonging and similarity of practice, especially for using the WoDDI. Also, the community physicians, initially reluctant towards a non medical approach were then generally convinced by the positive results obtained by their patients. However, after two years of a pilot study in four centers located in fours different areas of the province, the CSST ended its support to the project. This was mainly due to a limited referral to the program by the CSST caseworkers, leading the CSST decision makers think that they were paying too much for this service. However, this limited number of referrals was due to a lack of appropriation of this

project by the caseworkers. They were complaining losing their decision power in referrals, being submitted to a larger workload due to collaboration and perceiving a role conflict that might lead to their own dismissal by the CSST. In our view, this demonstrates that TD action needs the participation of a large number of social actors and may not be implemented without a large effort of not only training but mainly inclusion of all the participants in the TD space. If it is to be successful, existing social rules, professional roles and values, laws and regulations and conflicting interests must be recognized and addressed appropriately, preparing an appropriate TD space before TD action is implemented in the community.

## 3- Teaching work disability in a TD way

As recommended by its promoters, teaching TD is necessary in order to allow that the complex problems we are facing be solved in the future (Morin, 1997; Nicolescu, 2002). We have tried to apply this to rehabilitation practice and WDP through three advanced programs developed since 2000 at the Université de Sherbrooke.

### 3.1 Masters in rehabilitation practice

The Masters in rehabilitation practice is a professional degree (delivered in French language) whose objective is to bring interdisciplinary knowledge skills and attitudes to rehabilitation professionals practicing for at least two years. It is aimed at improving clinical practice. Diverse professionals are working in the large field of rehabilitation (e.g. physiotherapists, occupational therapists, occupational health nurses, social workers, speech therapists, etc.). These professions are issued from the needs of patients having disabling conditions and were developed before a large effort of conceptualization of the field of rehabilitation was undertaken. Consequently, many rehabilitation professionals do not have all the necessary skills to work together in interdisciplinarity and transdisciplinarity, i.e. sharing the same conceptual models and avoiding role conflict. This was the rationale for developing this Masters degree (http://www.usherbrooke.ca/programmes/maitrise/pratiq-re.html). It is competency-based, meaning that instead of objectives teachers and students are aware of the knowledge, skills and attitudes they have to transmit or acquire. Among these competencies, are: To see himself as a professional inside the current trends in rehabilitation; to intervene in a rehabilitation team in the context of problem solving; analyse ethical questions related to professional practice; take a professional role in the context of an interdisciplinary team. Situated in the "healthcare level of reality", it brings awareness of the other levels of reality to HCPs. Teaching methods rely on cooperative (sharing between peers) and experiential (based on acquired experience) learning. Main topics are methods in professional action, program evaluation, interdisciplinarity, community, ethics, all linked to the field of rehabilitation. TD is effective at the teachers' level as they are issued from diverse disciplines and at the students' level as many different professionals are registered in the courses. Since 2000, more than one hundred students have been or are being trained in this program, and we hope that in the coming years, this will influence a more TD vision and action in the practice of rehabilitation in Québec. Some courses are now partly or fully web-based and we are really interested in

sharing this experience with other universities in order to adapt this course to the various realities of other settings.

### 3.2 Diploma in work disability prevention (WDP)

The diploma in WDP is a recently developed professional degree (delivered in French language) whose objective is to bring interdisciplinary knowledge skills and attitudes to disability managers from workplaces and insurance companies (public or private) having at least two years of professional experience (http://www.usherbrooke.ca/handicap/fr/formation/dipl_pri.html). This is the counterpart for disability managers of the previous Masters for clinicians. This program, issued from researchers from the above-mentioned research team, is delivered jointly by Université de Sherbrooke and Université du Québec à Montréal (UQÀM). Situated in the "insurance and workplace levels of reality", it brings awareness of the other levels of reality to disability managers. Here again, among the aimed competencies, are: to develop effective human relationships with the various actors working in work disability prevention, and to develop an ethical practice. Teaching methods rely also on cooperative and experiential learning. Also, the TD vision is brought by the team of teachers coming from different disciplines (health, law and management related) and by the students who come from different professions and work in different contexts (employer, insurer, union). This program will be mainly web-based in the near future, in order to be available to the many remote settings of the province of Québec. Here again, we intend to share this expertise with other universities from different countries.

It might have looked as "ideal" to bring together clinicians and managers from the different levels of reality in the same training program. However, this would have been difficult for the following reasons. Basic education level is generally higher in health professions and previous knowledge is very different. Also, institutional values are often quite different. We have preferred to avoid potential conflicts and learning difficulties in the present social state and make these actors aware of the other levels of reality in a different course. We hope that, in the following years, more integrated bridges may be built between these programs in order to improve the TD experience.

### 3.3- The Work Disability Prevention CIHR Strategic Training Program

The training of TD for researchers in WDP was made possible at a more advanced educational stage, through the Work Disability Prevention CIHR Strategic Training Program (Loisel et al., 2005a, http://www.usherbrooke.ca/handicap/eng/index.html). The Canadian Institutes for Health Research (CIHR) have launched in 2001 a call for proposals named: "Health Researchers for the 21st Century" (http://www.cihr-irsc.gc.ca/e/4173.html). Among the objectives of this funding program were: "to build a culture of creativity, innovation and TD research within the next generation of health researchers; encourage and enable highly motivated individuals from Canada and abroad to undertake training in health research in Canada; support the development of innovative, effective, and competitive TD training programs in health research in Canada". Also, CIHR wanted to encourage "contributions of diverse research disciplines

and methodological approaches to resolution of major health issues and scientific challenges, training in the ethical conduct of research and discussion of ethical issues related to the research focus of the training program, development of essential professional and personal elements such as communication, teamwork, and leadership, training in effective research translation". A team of 24 researchers, from nine Canadian universities has applied to this call for proposal and was awarded a large grant, making them able to develop this advanced training for researchers and offering it for free to ten trainees from Canada and other countries every year (ref JOR).

As above underlined, the context of WDP and a fortiori of WDP research is characterized by complexity. But, the field of WDP is young and only few researchers dedicate their efforts to that field. Moreover, most researchers entering this field come from a specific discipline without usual links to work and health. It follows that they often have a relatively narrow perspective and are not well prepared to address the complexity of WDP. In particular, they are not trained to design and conduct field studies involving multiple stakeholders who have different perspectives (e.g.: employers, unions, workers' compensation boards (WCBs)). The task of developing and implementing research projects may be difficult and may discourage some of them from remaining in the field. This in turn impairs knowledge transfer to users. Also, narrow disciplinary view of the problem is at risk of giving invalid results by overlooking and not understanding the influence of all the factors involved in work disability. Unfortunately, opportunities for training are scarce and available in only a handful of dispersed research centres. Moreover, advanced research training programs attracting high-quality WDP applicants and giving appropriate TD training are lacking.

The key elements of the training program are the following:
1- To provide a TD perspective at the beginning of the research training experience: given the complementary disciplinary expertise of the mentors proposing this training program and their extensive experience in collaborating with researchers from other disciplines and stakeholders in the research settings, it was postulated that their experience would be invaluable to young trainees. Also, the fact of bringing trainees from various disciplines together in the same WDP course would allow for a fruitful exchange of TD experiences. In this way, TD would not be only a subject of study, but also a living experience shared by trainees and mentors from different disciplines.

2- To change attitudes: Most of the program's educational activities would allow trainees to develop rigor, openness and tolerance (http://nicol.club.fr/ciret/english/charten.htm) through discussions with the program mentors in the context of various teaching activities and discussions between trainees from very different disciplines.

3- To be a complementary program: the program is offered to trainees already registered in a graduate-level research training program and is superimposed onto the in-depth knowledge acquired in a precise disciplinary field. The WDP training program allows trainees to broaden their disciplinary vision in order for them to grasp a global view of all the components involved in of the WDP field.

4- A competency-based approach allows the development of complex abilities designed to facilitate appropriate reflection and action in the researcher's professional life. These competencies are: 1. To analyze a research problem from a TD and contextual perspective in order to maximize research relevance and impact; 2. To integrate relevant ethical and legal issues into the design and implementation of WDP research; 3. To effectively communicate information on a specific research project or methods to all other researchers involved in disciplines in the WDP field; 4. To incorporate the elements needed to develop a research approach that factors in the participation of relevant stakeholders; 5. To participate in activities promoting knowledge exchange such as scientific presentations, presentations to stakeholders or publications.

5- Collaborative learning between the students from different disciplines and bringing their own knowledge and experience to others.

This TD training program is offered to applicants registered for a PhD degree or post-doctoral studies in a university from any country or to young researchers having a research project in the field of WDP. Admission is based on excellence and mix of different disciplines. It is a part time program, extended upon three years. The core activity is a two week June session, prepared by e-learning activities. Each activity is accompanied by a minimum of two "mentors" from different disciplines, teachers registered in the program. Training activities in the June session are: presentation and discussion by a teacher or an invited lecturer, academic or stakeholder in the WDP field (e.g.: employer, union representative, insurer representative); TD case study (discussion of a complex case), seminars on the trainees' project, workplace visit. Each year, one of three topics alternatively dominates the session: methodological, socio-political or ethical challenges in WDP. At the beginning of the session, a full day is dedicated to TD. The first year of the program, we were honoured by the visit of Basarab Nicolescu who presented to the students the principles of TD. This view, issued from theoretical physics, a topic far from WDP, has really fascinated the students. In 2005, Glenn Albrecht from Newcastle University, Australia, spoke about TD applied to complex population health problems in industrial or native populations in Australia. Lessons from TD theory are applied to the WDP problem. Other topics are studied from different perspectives inside the TD space. For example, a topic was "pain in the workplace". The pain experience was presented from a biological, medical, psychological, legal and unionist point of view. Another one addressed the differences of work disability management between countries or provinces. Distributed in small teams, the trainees had to read on regulations in their own country and to interview someone from the insurance system, prior to the session. During the session, they presented their work before their peers and the mentors and were exposed to the considerable differences among systems. Various research methods from different disciplines are also presented in order to allow the students to be aware of the methods of the other disciplines.

Added to the June session, are optional activities that may be writing an article, making a knowledge transfer activity to scientific or non scientific audiences or visiting a recognised WDP centre. All these activities must be supervised by a program mentor.

In summary, this program brings together mentors and students from various disciplines and countries. The diversity in disciplinary and cultural backgrounds might have led to major difficulties since conceptual frameworks and jargon differ from one discipline to the other. Instead, the program is conceptualized as high-level TD training. Scientific rigor, openness, and tolerance guide the students' training. Bringing together mentors and trainees in an innovative coherent training program allows for a fruitful exchange of TD experiences.

From its start in 2003, the program has attracted 27 high quality students from multiple disciplines (ergonomics, medicine, social sciences, anthropology, psychology, kinesiology, occupational therapy, physiotherapy), registered in Canadian, European, American and Australian Universities. Various cultural origins from all continents are also represented. This, added to a large diversity of mentors' disciplines and location, brings a considerable richness in discussions and TD experience. Rigor, openness and tolerance are an essential rule, repeated by the mentors and largely applied by students who learn to maintain rigor in avoiding disciplinary jargon and enrich their research projects from other disciplines experience and methods. Between sessions, students communicate frequently by e-mail and an international research network of promising young researchers in WDP is being developed. All this training (including travel expenses) is entirely free for the registered students, due to the CIHR grant. As the grant will end in 2008, we are looking for other support in order to maintain the high quality and international availability of the program. Similarly, we will rapidly extend our staff of mentors to foreign colleagues in the field, sharing the same TD values and having presented at a session. Also, selected graduate students will be invited to participate as future collaborators to the program.

**Conclusion**

We are not TD theorists and have come to TD by the necessity of the disability paradigm. We were facing problem complexity, person-environment models, multiple levels of social reality having their own logic, ignoring other levels and neglecting the fate of a single person facing work disability and failure of a single discipline to bring appropriate solutions. All these elements, requiring a TD perspective for appropriate action, were brought together. We were able to gather large TD teams for research, intervention and education, from several universities and research centres in Canada and now from diverse countries. We thank the Université de Sherbrooke and its school of medicine to have welcome and supported this development. Now, building on the development of its Aging Institute, our Work Disability Prevention Research and Training Centre, the Research Chair in work rehabilitation (Bombardier et Pratt & Whitney Canada) and the above-mentioned research and training programs, our school of medicine, a WHO collaborating centre, will open next year a department of rehabilitation. It will be the first TD department of the Université de Sherbrooke. Appointment will not be related to a disciplinary belonging but to an expertise in disability issues. Training will be open to a large range of disciplinary applicants and I hope that this department will make TD teaching well alive and an example for all others that have to deal with complexity in their own field.

**References**


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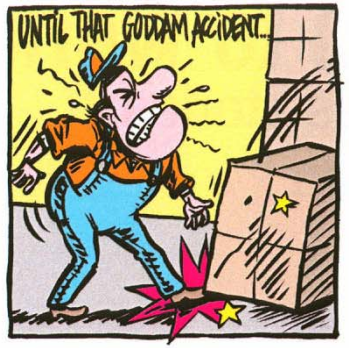
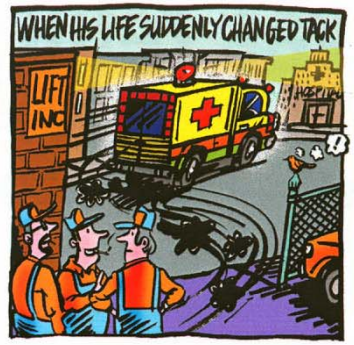
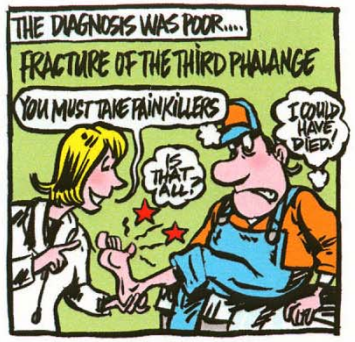
# Annex A

# Maurice's Left Foot

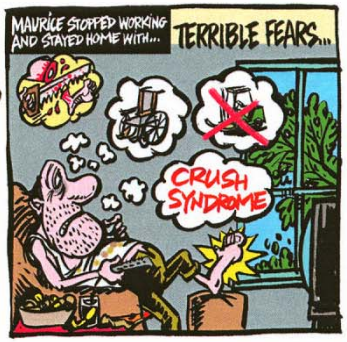
## FROM INJURY TO RECOVERY

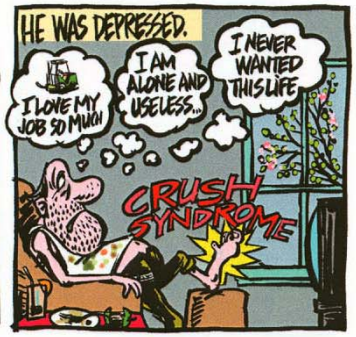



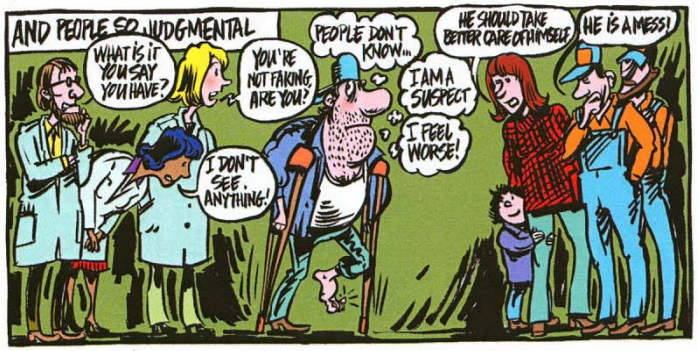




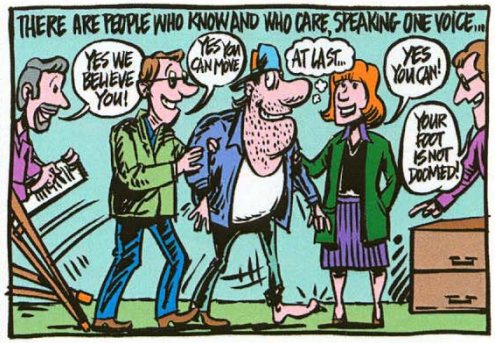


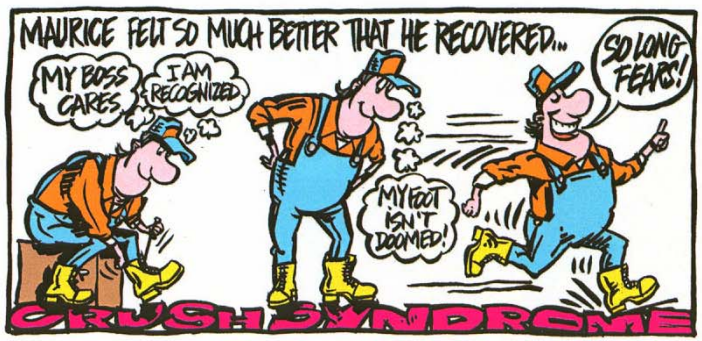












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