L'Impact de l'Éducation en Éthique pour la Science du Laboratoire Médical

The Impact of Ethics Education in Medical Laboratory Science

par

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THE IMPACT OF ETHICS EDUCATION IN MEDICAL LABORATORY SCIENCE

SUMMARY

The goal of the study was to evaluate the impact of ethics education on the increase or decline of moral maturation, based on Lawrence Kohlberg's model of moral development, during training in Medical Laboratory Technology (MLT) and amongst technologists working in the field Canada wide. It was loosely modeled after a University of Sherbrooke study conducted in 2003, wherein the moral development of medical students was the focus. A bilingual quantitative survey, based on the Defining Issues Test (DIT), the Problem Identification Test (PIT) and Kohlberg's Moral Judgment Interview (MM), was created and distributed to students and 2 year post graduates. A questionnaire designed to determine the types of ethics education offered in MLT programs was designed for teachers and distributed to those who were interested in participating. Results of the study were based on responses from 100 1st year students, from 84 end of program students, 40 two year post graduates and 14 teachers.

The research project had as its goal to answer the following research questions:

1) Do Canadian Medical Laboratory Technology (MLT) students receive compulsory instruction in ethics?
2) What types of ethics education do MLT students receive? That is, is their instruction delivered in general ethics courses, specific "biomedical ethics" courses or as ethics topics integrated into the core laboratory courses?
3) What, if any, is the impact of ethics education in the practice of biomedical laboratory technology?

 Teachers and students were asked what ethics education is offered in their program. The survey of the teachers regarding ethics education revealed some differences between English and French schools. It was found that French schools
favoured ethics courses taught by philosophers while English schools favoured ethics courses taught by health care providers. Furthermore, case studies were reported to be used more often in English schools and more often in assignments. However, regardless of the differences, 87% of teachers agreed that ethics training is a high priority and most teachers thought that ethics training in their programs was adequate. At the same time, students were asked to answer some questions that involved ethical dilemmas wherein some moral decisions would have to be made. Their responses revealed their level of moral development, based on Kohlberg's theory of moral development. The impact of ethics courses in the curriculum on moral development was correlated taking into account what ethics education students actually received with what year-of-study they were in (1st year, end of program or two years post graduation).

Students were presented scenarios about falsifying records, communication, student dishonesty and preanalytical impact on patient care. These are authentic issues that technologists face on a daily basis. In reply to multiple-choice questions, respondents chose, in order of personal preference, the three best answers out of six offered to complete a statement regarding ethics. Statistical analysis was performed using SPSS (Statistical Package for Social Studies), employing crosstabulations and One way ANOVA. Factors including respondents age range, mother tongue, gender, and years of schooling were considered.

It was demonstrated that ethics education across Canada is fragmented. Regardless of ethics courses offered, no significant increase or decrease in moral development was observed regarding age range, mother tongue, gender, and years of schooling. It was interesting to note that in Scenario 3, the one regarding student dishonesty, all respondents 2nd choices revealed a lower stage of moral development than in the other 3 scenarios. In conclusion, ethics education, as it now stands, does not have any significant impact on the ethical practice of laboratory medicine, either
positive or negative. Because the CSMLS competency profile applies to all MLT programs across Canada, there is a need to create a unified national syllabus for ethics education.

No research was found that related directly to the teaching of ethics in MLS programs. Professionalism is a competency that is very much in the foreground now given Category 11 in the "Competencies Expected of an Entry-level MLT" that will be in effect for the June 2010 examinations. The very last competency (Number, 11.11) is devoted specifically to ethical issues but ethics are integral to every competency and sub-competency. This research project is, therefore, very relevant to the present state of education in medical technology. Although this project is a cross-sectional study, it has been adapted to become a longitudinal study, continuing to encompass the effect of the new competencies in the workplace.
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RÉSUMÉ

Le but de cette étude était d'évaluer l'impact de l'éducation éthique sur l'augmentation ou le déclin de l'évolution morale, basé sur le modèle du développement moral de Lawrence Kohlberg, durant la formation en «Medical Laboratory Technology» (MLT) ainsi que parmi des technologistes médicales travaillant dans vaste territoire Canadien. Cette étude fut inspiré de celle faite à l’Université de Sherbrooke en 2003, où le focus était axé sur le développement moral des étudiants en médecine. Un sondage quantitatif bilingue, base sur le « Defining Issues Test » (DIT), le « Problem Identification Test » (PIT) et le « Moral Judgment Interview » (MJI) de Kohlberg, fût créé et distribué aux étudiants et aux post-gradués de 2 ans. Un questionnaire, visant à établir quel type d’éducation éthique était offert dans les programmes du MLT, à été développé pour les enseignants et distribué à ceux qui étaient intéressés à participer. Les résultats de l’étude furent basés sur les réponses de 100 étudiants de première année, 84 étudiants en fin de programme, 40 étudiants post-gradués de 2 ans et 14 enseignants.

Le projet de recherche avait comme but de répondre aux questions de recherche suivantes :

1) Est-ce que les étudiants du « Medical Laboratory Technology » (MLT) reçoivent un enseignement éthique obligatoire ?

2) Quel type d’éducation éthique les étudiants du MLT reçoivent ? Y a-t-il une méthode enseigné dans les cours d’éthique générale, les cours spécifiques d’« éthiques biomédicales » ou est-ce que les sujets d’éthique sont intégrés dans les cours de laboratoire ?

3) Si existant, quel est l’impact de l’éducation éthique dans la pratique de la médecine biomédicale en laboratoire?

Les enseignants et les étudiants se sont fait demander quelle éducation éthique était offerte dans leur programme. Le sondage auprès des enseignants portant sur l’éducation éthique a révélé une différence entre les écoles francophones et anglophones. Il a été établi que les centres d’enseignement francophone favorisaient les cours d’éthique enseignés par des philosophes tandis que les établissements anglophones préféraient les cours d’éthique enseignés par des personnels de la santé. De plus, il a été démontré que les études de cas ont été plus fréquemment utilisées dans les travaux et les cours des établissements anglophones. Par contre, malgré ces
différences, 87% des enseignants étaient d'avis que la formation éthique est d'une grande priorité et la plupart des enseignants ont affirmé que leur formation éthique était adéquate pour leur programme. Au même moment, nous avons demandé aux étudiants de répondre à certaines questions qui impliquaient des dilemmes éthiques où des décisions morales devaient être prises. Leurs réponses démontraient leurs niveaux de développement moral, basé sur la théorie du développement moral de Kohlberg. L'impact des cours d'éthique dans le curriculum du développement moral corrélait en tenant compte que les étudiants en éthique recevaient actuellement ce dans quel niveau d'étude ils étaient (première année, fin de programme ou post-gradué de 2 ans).

Les étudiants se sont fait présenter des scénarios impliquant de la falsification de dossiers, de la communication, de la malhonnêteté et l'impact pré-analytique du soin au patient. Ce sont de réels problèmes que les technologues doivent faire face quotidiennement. En réponse à un questionnaire à choix multiples, les répondants ont choisi, selon leurs références personnelles, les trois meilleures réponses sur six pour compléter une déclaration sur l'éthique. Une analyse statistique a été faite utilisant SPSS (Statistical Package for Social Studies), employant des tabulations croisées ainsi qu'une analyse Anova unidirectionnelle. Les facteurs incluant le registre d'âge des répondants, la langue maternelle, le sexe et la scolarité ont été considérés.

Il a été démontré que l'éducation éthique à travers le Canada est fragmentée. Malgré les cours d'éthique qui ont été offerts, aucune augmentation ou diminution significative du développement moral a été observé regardant le registre d'âge, la langue maternelle, le sexe and la scolarité. Il a été intéressant de noter que, dans le scénario 3, celui impliquant la malhonnêteté étudiante, tous les 2e choix des répondants ont révélé un niveau de développement moral plus bas que dans les 3 autres scénarios. En conclusion, l'éducation éthique, comme il a été démontré, n'a pas d'impact significative sur la pratique de l'éthique en médecine de laboratoire, que ce soit positif ou négatif. Puisque le profile de compétence du CSMLS s'applique à tous les programmes Canadien du MLT, il existe un besoin de créer un syllabus national pour l'éducation éthique.

Aucune recherche relatant directement l'enseignement en éthique dans les programmes du MLS n'ont été trouvées. Le professionnalisme est une compétence qui est énormément en premier plan étant donné la catégorie 11 du « Competencies Expected of an Entry-level MLT » qui sera en application lors des examens de Juin 2010. La toute dernière compétence (Numéro, 11.11) est dévouée spécifiquement aux problèmes éthiques mais l'éthique se retrouve dans toutes les compétences et sous-compétences. Donc, ce projet de recherche est très lié au programme d'éducation en technologie médicale en cours. Bien que ce projet soit une étude multidirectionnelle, il a été adapté pour devenir une étude longitudinale, permettant de comprendre l'effet des nouvelles compétences dans un lieu de travail.
ACKNOWLEDGEMENTS

There are many people, too numerous to mention, whose support has been crucial in carrying me through the process of completing this thesis.

Mom and Dad, Chris and Ian, thank you for giving me the courage to persevere. You have been there, showing faith in me through the good times and bad times. I will always be grateful for your love and support.

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All of my MTP colleagues and teachers in the program have contributed greatly to this endeavor. Thank you to my adviser, Carollyn Dellah, for the many hours that she spent reviewing, discussing and helping me to reorganize my thoughts and my research data. Special thanks to Ann Logan for volunteering her precious time to help me put together my data in SPSS, to Remi Cardinal and Linda Peletier for translations into French and to Moira Grant and Kurt Davis for lending their invaluable support from the Canadian Society for Medical Laboratory Science (CSMLS).

And last, but far from least, I would like to acknowledge my friend and study partner, Toni Taylor, who has always found time since the first class to encourage me and discuss whatever was on my mind throughout this great adventure.
INTRODUCTION

Interested biomedical laboratory technologists working in the Central Laboratory at the Royal Victoria Hospital apply for reassignment as clinical instructors to teach stage (internship) students in their 6th semester of the Biomedical Laboratory Program of Dawson College. Technologists occasionally also have the opportunity to teach courses or segments of courses in the program. Because last years’ graduates become the clinical instructors’ coworkers they want to be assured that their new coworkers behave ethically. Hospital employees liaise with other health care workers on a daily basis and a lack of ethical behaviour from many levels of professionals has been noted. Technologists and instructors have also encountered many instances of students behaving in an unethical and unprofessional manner, including such practices as discussion of patient cases in the cafeteria or not calling the appropriate person when they are absent from their scheduled work time. Ethics encompass moral standards that regulate right and wrong behaviour. Professionalism encompasses a set of values including attitudes and behaviours based on an ethical code. Since biomedical ethics and professionalism unite to deliver quality patient care, it is therefore very important to establish and implement values and practices that improve these behaviours in the workplace.

Are medical ethics being taught? Is there any consistent training and assessment of medical ethics and if so, how successful is it? Can one relate the teaching of medical ethics to medical laboratory science? A review of relevant articles reveals that guidelines for successful programs in medical ethics are unmistakably deficient. In an effort to provide training in ethics and to present authentic case studies, the researcher has authored and teaches a continuing education course for students in medical laboratory technology entitled “An Introduction to Ethics and Professionalism for Medical Technologists”. This course was designed specifically for the Canadian Society for Medical Laboratory Science (CSMLS), the national
professional association for medical technologists. It is possible that for biomedical technologists a compulsory course such as this one might be part of the solution? Witnessing unethical behaviour in the workplace and being involved in designing the course for the CSMLS motivated the author to pursue this line of investigation further. To this end the author designed a research study to determine what types of ethics courses are taught and the impact of ethics education on biomedical laboratory medicine.

There is no literature referring directly to how ethics education impacts Biomedical Laboratory Technology students. The literature that is available refers primarily to ethical training for student physicians and nurses. As in the medical school ethics training cited below, ethics are taught in MLT but there are no documented consistent pedagogical approaches taken to accomplish that goal. The researcher has used case studies and scenarios as teaching tools but with varied instructional strategies and assessments.

The author undertook a cross-sectional study to determine the prevalence of ethics training and its effect on students and working technologists 2 years post graduation. A survey based on the Defining Issues Test (DIT), the Problem Identification Test (PIT) and Kohlberg’s Moral Judgment Interview (MJI) was developed by the researcher and used in this study. A conceptual definition of impact of ethics education in this study refers to how learning ethics influences ethical beliefs and practices. Eventually, one group of students from this study will become part of a longitudinal research project conducted by the author to identify ethical issues in the laboratory.
CHAPTER ONE

STATEMENT OF PROBLEM

"MLS (Medical Laboratory Science) education in Canada has been badly fragmented: institutions do their own thing based on local needs, on local policy directives, and on the availability and experience of staff and necessary resources. Of course, they teach to the competency profile, but there is no national uniformity of programs and there is little sharing of information. This means that it is very difficult to create a national picture of MLS education." (personal communication with Moira Grant, 2003)

No research was found that related directly to the teaching of ethics in MLS programs. Professionalism is a competency that is very much in the foreground now given Category 11 in the "Competencies Expected of an Entry-level MLT" that will be effective for the June 2010 examination. The very last competency Number, 11.11, is devoted to ethical issues but ethics are integral to every competency and sub-competency. This research project is, therefore, very relevant to the present state of education in medical technology. It is a cross-sectional study that has been adapted to become a longitudinal study, continuing to encompass the effect of the new competencies in the workplace (2012). Although a small step forward, this study indeed gives a national picture of MLS ethics education.
CHAPTER TWO
LITERATURE REVIEW

Physicians are trained as healers but that is not enough. They are also professionals and must follow a code of ethics in which patients (their clients) and society are their priority. Physicians come from varied socio-economic backgrounds and therefore have different value structures, making the need for the explicit teaching of professionalism essential. Researchers agree that the medical profession is concerned with providing ethics education (Cruess and Cruess (1997), Obanoglu and Kayhan (2006), Weaver (2007) and Mattick & Bligh (2006)). In an effort to accomplish this Cruess and Cruess (1997) stress that “medical schools, teaching hospitals, and those responsible for continuing medical education should teach professionalism as a subject formally identified in the curriculum” (Cruess and Cruess, 1997, p.1676). Weaver (2007) asserts that ethical sensitivity is a growing concept that is a part of decision making in medical practice, however, its meaning is still inconclusive and unclear, limiting understanding and communication among disciplines. Obanoglu and Kayhan (2006) state that, in Turkey, agreement on ethics education is lacking including how it should be taught and how it should be integrated into the curriculum. Their study of physicians who were university professors in Turkey concluded that ethics education is essential and suggest that it must have an important place in clinical and research instruction.

2.1 PEDAGOGICAL APPROACHES

Bioethics is being taught in medical schools in Canada as a requirement of accreditation. However, exactly how students should receive education in ethics is contentious. McKneally and Singer (2001) believe that the use of a more interactive, hands-on approach led by physicians who bring relevant paradigms to the bedside, is preferable for training medical students. For example, how to ask for informed consent is something that doctors in training must learn. Other evaluations
incorporate authentic cases and scenarios. These include In Training Evaluation Reports (ITERs), which record student involvement in case discussions and review how the student has charted orders, and Objective Structured Clinical Examinations (OSCEs), which consist of simulated doctor/patient interviews in which case histories are presented to the student and volunteers act as their patients.

Akabayashi et al. (2004, p.2) suggest that appropriate programs can positively influence moral reasoning. This was demonstrated by Robb, Etchells, Cusimano, Cohen, Singer, & McNeally, (2004), who carried out a study to compare two methods of teaching how to obtain informed consent prior to surgery. One method was the use of a traditional seminar where surgical residents took part in a one hour tutorial and discussion group and using a case study. The other method used a standardized patient (SP) based seminar in which an actor portrayed the patient. The same surgeon, experienced in bioethics, conducted both seminars. One questionnaire evaluated knowledge using a 20 question short answer written examination given after the seminar and again after three weeks. Robb et al. (2004) determined that: SP based seminars may be more useful for teaching communication and interpersonal performance, whereas traditional seminars may be better for content. Because effective communication and interpersonal skills are essential in the informed consent process, observing an expert SP interview conducted by a local role model might have more impact on improving resident performance in this domain. (Robb et al., 2004, p.456)

classroom, students offer, present and justify guidelines on their topic in class discussion. Finally, Harwood states that “One way to foster the development of critical reasoning skills in the undergraduate setting is to provide groups of students with the opportunity to research, analyze, discuss and propose policy on emerging topics in bioethics.” (Harwood, 2004-2005, p.2)

Singer (2003) suggests that the administration of the Moral Judgment Interview (testing moral reasoning but not moral beliefs) at the time of student admission into medical school might be apropos. Lowe, Kerridge, Bore, Munro & Powis (2001) concur but caution that since studies have proven that courses in medical ethics can increase moral reasoning it might be more appropriate to test for personality disorders. Singer (2003) and Lowe, Kerridge, Bore, Munro & Powis (2001) argue that there is no proof that preadmission testing would result in producing more ethical clinicians. However, another method Singer suggests is to “create an ethical learning climate”. (Singer, 2003, p.854.) Singer (2003) cites a study in which students claim that they have observed or are involved in unethical behaviour in the clinical setting. Nearly half felt coerced into doing so. Singer (2003) asserts that the solution to this problem requires positive role modeling by physicians and guidelines for ethics in medical teaching. For example, the University of Toronto developed guidelines for medical students which cover the commitment of the healthcare network to such topics as clear communication, ethical concerns, appropriate supervision and confidentiality. (University of Toronto, 2003)

Kalu and Chowdhury (2005) identify a need for ethics and law training in obstetrics and gynecology as part of a postgraduate curriculum. These courses would not be designed to create moral character but rather to facilitate its use in moral dilemmas. In this way, teaching strategies would foster deeper learning as students would learn how to achieve rational analysis. Kalu and Chowdhury (2005) suggest an interactive group approach using a physician or clinical ethicist as the professor and
utilizing a problem-based learning style. Case studies are suggested with the members motivating each other and sharing their expertise. This type of learning would be student driven and the teacher would act as a facilitator.

Assessments are not conducted when using this type of problem-based teaching format. Kalu and Chowdhury (2005) explain that summative assessments may be detrimental to motivation, but that formative assessments are useful in the learning process, allowing the students “to make mistakes in the safe environment of guided learning”. (Kalu and Chowdhury, 2005, p.48)

Mattick & Bligh (2006), in a qualitative study, further expressed a problem with teaching ethics in the UK. They concluded that weaknesses in the curriculum included insufficiently trained staff, the need to integrate ethics into other courses and a need for more small group activities. Suggestions for improvements included e-learning and information technology, integration and staff training.

The literature reveals that there are many and varied methods of teaching ethics to medical students. Although critical thinking skills and interactive learning are emphasized, there is little consensus on the most effective methods for teaching or assessing medical ethics. Singer (2003) asserts that there is an immediate need to research bioethics in education and carry out the findings worldwide.

2.2 STUDIES ON MORAL DEVELOPMENT OF MEDICAL STUDENTS

In *Theories of Development*, Crain (1985) discusses the research of Lawrence Kohlberg, a scholar whose life-long work focused on moral development. He was influenced by Jean Piaget’s research consisting of a two-stage theory which described the moral development of children which Piaget believed developed in response to interactions to their surroundings. Kohlberg expanded on Piaget’s theory. His doctoral
dissertation in 1958 at the University of Chicago contained the first version of Kohlberg’s six stage theory. (See Table 1) Kohlberg believed that there was a

Table 1
Kohlberg’s Stages of Moral Development

<table>
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<tr>
<th>Preconventional morality</th>
<th>Conventional morality</th>
<th>Postconventional morality</th>
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<tbody>
<tr>
<td>Stage 1</td>
<td>Stage 2</td>
<td>Stage 3</td>
</tr>
<tr>
<td>Avoidance of physical punishment and deference to authority figures (e.g., parents, teachers): The physical consequences of an act wholly determine the goodness or badness of that act.</td>
<td>Instrumental exchange: Right actions are those that instrumentally satisfy one’s own needs. People are valued in terms of their utility.</td>
<td>Interpersonal conformity: Right actions are those that conform to the behavioural expectations of one’s society or peers, for the purpose of gaining the approval of others.</td>
</tr>
<tr>
<td>Stage 4</td>
<td>Stage 5</td>
<td>Stage 6</td>
</tr>
<tr>
<td>Law and order: Right actions consist of doing one’s duty, showing respect for authority and maintaining the given social and institutional order for its own sake. Deviation from rules will lead to social chaos.</td>
<td>Social contract: Behaviour is guided by a sense of obligation because of a social contract to make and abide by laws for the welfare of all and for the protection of all people’s rights. There is a feeling of contractual commitment, freely entered upon, to family relationships, friendships and work obligations. Laws and duties should be based on a rational calculation of overall utility: “The greatest good for the greatest number.”</td>
<td>Universal ethical principles: Right actions are defined in terms of universal moral principles (justice, equality of human rights and respect for the dignity of human beings as individuals) and a sense of personal commitment to them.</td>
</tr>
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Hierarchic integration of the stages, meaning that people moved through stages from one to six and that regression does not occur. As one moves from one stage to another they incorporate ideologies learned from the earlier stages. However, it is possible for one to be in transition between stages. It is noted that Kohlberg believed that his
theory holds true across cultures because it is measuring types of reasoning and not beliefs.

Kohlberg’s research sample was seventy-two boys from Chicago, ages 10, 13 and 16. Kohlberg presented moral dilemmas and then interviewed the children to discover not necessarily their responses as to what is right or wrong but the reasoning behind their responses. Kohlberg contends that moral development does not take place due to maturation or socialization but as a product of reflection on moral issues. This is facilitated through interaction and open discussion about problems, resulting in construction of principles. Kohlberg’s longitudinal studies demonstrated that Stage 4 development was reached by the age of 16 and that Stage 5 development only emerges by the mid twenties but is not predominant. Gilligan (Crain, 1985) contends that Kohlberg’s research only includes males who focus more on rights and rules, often scoring at stages 4 and 5. Since females focus more on interpersonal relationships they score at a lower stage than males. Crain (1985) also postulates that Kohlberg’s scale relates to moral reasoning and this does not necessarily result in moral behaviour. However, Kohlberg suggests that moral action becomes more inevitable as one reaches higher stages of moral development. This theory has been backed by many studies but the conclusions are still not well defined. (Crain, 1985)

The literature discloses that moral development does not take place during medical school. Studies have been undertaken to measure moral development in medical students. Although varied approaches to instructional strategies and assessments are implemented in medical training, evidence suggests that moral judgment amongst medical students decreases with age and years of study. (Patenaude, Niyonsenga and Fafard, 2003, Akabayashi, Slingsby, Kai, Nishimura, and Yamagishi, 2004 and Slovackova and Slovacek, 2007) Patenaude, Niyonsenga and Fafard, (2003) carried out a longitudinal study at the University of Sherbrooke to test the moral judgment of medical students in response to moral dilemmas. They
administered the tests at the start of the first year and at the end of the third year of medical school. Kohlberg’s Moral Judgment Interview (MJI), based on Kohlberg’s stages of moral development was used. Kohlberg’s MJI has been validated in many cultures and socioeconomic conditions worldwide. (Patenaude, Niyonsenga and Fafard, 2003) Concurring with previous studies, there was no significant overall change after three years of medical school. The expected moral development was not demonstrated.

Patenaude, Niyonsenga and Fafard, (2003) also carried out a parallel study at the University of Sherbrooke using the same subjects, to track the evolution of their moral reasoning. This study also used the MJI based on Kohlberg’s stages of moral development as shown in Table 1. These range from lower reasoning, Stage 1 to higher reasoning, Stage 6. The stages are: Preconventional (Stage 1: obedience/ Stage 2: self-interest), Conventional (Stage 3: conformity/ Stage 4: law-and-order), and Postconventional (Stage 5: human rights/ Stage 6: universal human ethics). The study concluded that there was an absence of moral development after three years of medical school. The first pattern was that after three years of medical school students chose self-interest (stage 2) lower reasoning instead of a predominance of law and order (stage 4)/social contract (stage 5), as was expected. The second pattern was that students change how they deal with ethical questions. It is possible that the need to act during clinical training changes the emphasis from moral obligation to simply satisfying the behavioural expectations of their colleagues. Patenaude, Niyonsenga & Fafard (2003, p.843) concluded that “the challenge will be to develop a curriculum that will enable medical students to at least maintain their stage of moral development if not increase it through the medical education experience.” Jang (2003) disagrees with the conclusions of the study. He contends that the data is inconclusive in terms of Kohlberg’s stages of moral development. He states that one must progress from one stage to the next and cannot regress as the University of Sherbrooke study suggests. Jang questions if it is even reasonable to expect medical programs to
provide a conceptual ethics framework training as long as students learn to “do the right thing” (Jang, 2003, p.57).

Ethics courses are mandatory in medical schools but there are no definitive methods of assessing whether or not students are developing moral reasoning. Akabayashi, Slingsby, Kai, Nishimura, and Yamagishi (2004) carried out a cross-sectional study at the University of Tokyo in order to develop a method for evaluating moral sensitivity and reasoning in medical students. They used two questionnaire surveys. The first, the Defining Issues Test (DIT), is based on Kohlberg’s Theory and a model created by Rest (1986). Neither of these tests is specific for medical ethics. The DIT is a reliable and valid method for measuring moral development. (Akabayashi, Slingsby, Kai, Nishimura, and Yamagishi, 2004) The second, the Problem Identification Test (PIT), is designed to measure moral sensitivity and reasoning, specific to medical ethics. It was tested for the first time as a measurement of medical school ethics instruction at the University of Tokyo in Japan. Akabayashi, Slingsby, Kai, Nishimura, and Yamagishi (2004) utilizing the PIT found an increase in students moral reasoning in third and fourth years when students begin seeing patients and a decrease in sixth year students and residents. These findings are consistent with previous studies. They also found, using the DIT, an increase in justice reasoning over time. The conclusions are similar in the MJI, the DIT and the PIT. Moral development does not increase, in fact it decreases, from the beginning to the end of medical schooling.

At Charles University in Prague, Czech Republic, Slovackova and Slovacek (2007) used Lind’s Moral Judgment Test to evaluate Czech, Slovak and foreign medical students’ moral judgment competencies (defined as level of ethical decision making) and moral attitudes (defined as personal ethical values). It was discovered that Czech and Slovak moral judgment competencies decreased with age and the length of their studies but moral attitudes remained the same. The medical faculty
dealt with the problem by introducing “intensive teaching of medical ethics, medical psychology and patient psychology. Special emphasis is put on sufficient practical teaching on wards”. (Slovackova and Slovacek, 2007, p.327)

Satterwhite, Satterwhite & Enarson’s (2000) surveyed medical students at the Wake Forest University School of Medicine in North Carolina, USA, regarding “derogatory comments”. A cross-sectional study was carried out to determine the moral development of medical students over four years of medical school. One school was surveyed. The survey was pre-tested twice. A questionnaire was utilized to survey whether medical students heard “derogatory comments” in the presence or absence of patients, how often the behaviour was observed, if the students participated in this behaviour and if there was a difference between years in medical school and acceptance of conduct. The findings showed that 3rd and 4th year students were more accepting of derogatory comments than 1st and 2nd year students but they believed that it did not affect their personal code of ethics. Satterwhite, Satterwhite III & Enarson (2000) say that the “goal as educators must be to alter the educational environment so that acceptance of such behaviour is not considered part of becoming a physician” (p.464). A four-year follow up study has been undertaken to clarify the ethical inconsistencies described in these findings.

Medical programs have employed many instructional strategies and assessments to identify and address the need for effective ethics training. Studies have shown a decrease in moral reasoning during medical school in spite of the fact that ethics are taught. Therefore, ethical training required may vary based on the types of competencies that are being taught, for instance, group activities for communication skill instruction verses lecturing to teach strictly medical content.

Studies have not been confined to medical education for physicians. Many studies have also been conducted in the field of nursing. For example, Kim, Park &
Han (2007) believe that nursing students must learn decision-making skills. A study was undertaken in Korea comparing nursing students with experienced nurses. Data regarding their philosophical inclinations toward idealism versus realism was collected. An idealistic attitude was defined as a high moral or intellectual value which may be impractical and a realistic attitude was defined as a pragmatic or true to life, moral judgment. It was found that although both groups scored higher on idealistic moral judgment, more experienced nurses scored higher for both idealistic and realistic moral judgment than nursing students.

Woods (2005) talks about a theory-practice gap in nursing, emphasizing that moral development occurs in response to ethical role models and experiential learning, in the clinical setting as much as in the classroom. To be effective ethics education in nursing schools needs to use less theoretical learning and more teaching in a clinical setting where they experience real ethical dilemmas. This is confirmed by the fact that recent graduate nurses often find it difficult to do the right thing when faced with uncertainty due to moral conflict or when overruled by physicians.

Nursing students and nurse practitioners both appear to be idealistic. However, the more experience nurses acquire the more pragmatic they become. It stands to reason, therefore, that moral development would be enhanced by more hands-on learning in the clinical setting.

The literature suggests that ethics are not being taken seriously enough. It is clear that instructional strategies and assessments could be improved. None of the methodologies designed to facilitate experiential higher order learning for teaching or assessments appear to have achieved heightened ethical awareness or behaviours. For example, a practitioner reading the literature would not find it surprising that medical students may be intimidated and accept the use of “derogatory comments” regarding patients on medical wards, for this is something that occurs regularly. To avoid this
occurrence positive role models are of utmost importance in the moral education of medical students. Mattick & Bligh (2006, p.181)

Mattick & Bligh (2006) found that 15 out of 22 professors in medical schools in the UK passed students who failed ethics courses. They stated that “this study raises the worrying finding that it is often possible for students to fail ethics and still graduate…” (p.184). It is, therefore, essential for medical schools to have a policy that includes making passing ethics courses mandatory.

Medical laboratory technologists function as an integral part of the multidisciplinary medical team. They have direct patient contact when they work as phlebotomists, procuring patient samples, or assist at such procedures as bone marrow aspirations. They also process patient samples in the laboratory. It is reasonable to presume that medical laboratory technologists in training must also receive education in ethics and that the outcomes that are prevalent in training other medical professionals might also hold true for medical laboratory technologists.
CHAPTER THREE

METHODOLOGY

3.1 RESEARCH QUESTIONS

Ethics encompass moral standards that regulate right and wrong behaviour. Professionalism encompasses a set of values including attitudes and behaviours based on an ethical code. Since biomedical ethics and professionalism unite to deliver quality patient care, it is therefore very important to establish and implement values and practices that improve these behaviours in the workplace.

Are medical ethics being taught to students going into the field of healthcare? Is there any consistent training and assessment of what medical ethics are being taught, and if so, how successful is it? Can one relate the teaching of medical ethics to medical laboratory science? The assessment of relevant articles reveals that guidelines for successful programs in medical ethics are unmistakably deficient. The main goal of this research effort is to determine if the present level of ethics education has any impact on the practice of medical laboratory technology.

The researcher designed a research study in which the following research questions are addressed:

1) Do Canadian Medical Laboratory Technology (MLT) students receive compulsory instruction in ethics?

2) What types of ethics education do MLT students receive? That is, is their instruction delivered in general ethics courses, specific “biomedical ethics” courses or as ethics topics integrated into the core laboratory courses?

3) What, if any, is the impact of ethics education in the practice of biomedical laboratory technology?
3.2 METHODOLOGY

This research project is an exploratory study using a correlation-based analysis. The goal is to evaluate the increase or decline of moral development during training in Medical Laboratory Technology and amongst technologists working in the field two years post MLT training. The survey was based on studies that used Kohlberg's model of moral development. However, because Kohlberg did not include females in his research and MLT is a female dominated field, comparisons were undertaken to see if there is a difference between male and female respondents. Also, in Canada, because the English/French distribution of MLTs is roughly 75:25, comparisons were made to evaluate the differences between English and French respondents.

3.2.1 Participants

A bilingual questionnaire (see Appendix 1) was sent to students and recent graduates of the twenty-five Biomedical Laboratory Technology Programs across Canada, nine of which are francophone Collège d'Enseignement Général et Professionnel (CEGEP) and accounted for 26% of 2006 graduates. The sample consisted of volunteers from the schools surveyed. Questionnaires were distributed by mail to the 25 MLT programs across Canada, including a total of 25 questionnaires (see Appendix 2) for teachers, and 400 surveys for students. Attempts were made to give equal amounts to first year students and third year/end of program students. A further 200 surveys were mailed to CSMLS in Hamilton where they were labeled and posted to randomly selected technologists who were 2 years post graduate. The packages sent to the post graduates contained consent forms (see Appendix 3), instructions and the questionnaires. All information included was in English or French depending on which school was being surveyed. All packages included self-addressed, stamped envelopes for the return of the surveys to the researcher. The envelopes were separated; 75% in English and 25% in French, according to the ratio
of English:French MLT students in Canada and sent to CSMLS in a single mailing. CSMLS printed labels in a random manner from their listing of 2 year post graduates. Surveys were sent by mail to 150 English and 50 French graduate technologists.

3.2.2 Instruments

A questionnaire was developed by the researcher to be given to the teachers in MLT. (See Appendix 2) The survey was administered to educators in all Biomedical Laboratory Technology Programs across Canada to determine if all Canadian biomedical laboratory technology students receive compulsory instruction in ethics, and of so, what types of ethics instruction must be taken to fulfill the requirements of the Biomedical Laboratory Technology program. They were asked to indicate the type their program required: general ethics courses, specific “biomedical ethics” courses or ethics topics that are built into the core laboratory courses of study.

Questionnaires were developed by the researcher to be administered to students and graduates. (See Appendix 1) The design was modeled after two studies, one at the University of Sherbrooke (Patenaude, Niyonsenga and Fafard, 2003) and the other at the University of Tokyo in Japan (Akabayashi, Slingsby, Kai, Nishimura, and Yamagishi, 2004). The questionnaires used in these studies were:

1) Kohlberg’s Moral Judgment Interview (MJI) to test the moral judgment of medical students in response to moral dilemmas.
2) the Defining Issues Test (DIT) based on Kohlberg’s Theory and a model created by Rest (1986)
3) the Problem Identification test (PIT) which is designed to measure moral sensitivity and reasoning, specific to medical ethics.

The MJI which used an open-ended survey and the DIT and the PIT questionnaires, which used closed-ended questions, together served as models for the MLT student survey designed by the researcher. For the purpose of this study, the scenarios and
30

questions used in Kohlberg’s MJII were changed to reflect the required elements in medical laboratory technology.

In the student questionnaire, students were asked to state their age, sex and language of their program. Then, scenarios were presented with 6 possible multiple choice answers representing Kohlberg’s 6 stages of moral development. Respondents were asked to choose the best 3 answers according to their 1st, 2nd and 3rd choices. An example was included to demonstrate how to answer the questions. (See Table 2.)

3.2.3 Explanation of the Scenarios

The questionnaire is designed to determine by what moral standards the respondents were motivated to do the right thing. Each scenario represents a different situation that working technologists face on a daily basis. The answers represent why technologists do what they do when they deal with important issues. Responses to the scenarios represent all of Kohlberg’s 6 Stages of Moral Development. The responses are presented in a scrambled manner, not in the order of the lowest to the highest moral stages. To see how the options correspond to Kohlberg’s stages, refer to Table 3. A mean was determined for each choice for each scenario, according to the category of the participant (1st year, end of program and 2 year post-graduate). Results will be presented in the following chapter.

Scenario 1, Patient Recall, is a news article reporting a case of a technologist who falsified results. This had potentially serious negative outcomes for patients. Indeed, it was reported that some patients whose results were falsified were deceased, although it was reported that it was not yet determined if the deaths were directly related to the falsified results.
**Table 2**

Survey Scenarios and Response Choices

### Scenarios and responses representing Kohlberg's 6 stages of development

<table>
<thead>
<tr>
<th>Scenarios:</th>
<th>Choose, in order of importance, the 3 statements you believe are most true for each scenario:</th>
</tr>
</thead>
</table>
| **Example: Chocolate.**
There are few foods that people feel as passionate about -- a passion that goes beyond a love for the "sweetness" of most candies or desserts: after all, few people crave caramel, whipped cream, or bubble gum. Chocolate is, well, different. For the true chocoholic, just thinking about chocolate can evoke a pleasurable response. | Choices example: I like chocolate because:
1. it tastes good
2. it is sweet
3. I like the color
4. it gives me energy
5. I can buy it anywhere
6. there are many kinds to choose from |
| **Scenario 1: Patient Recall**
Translated from Radio-Canada news September 13, 2007

Results of laboratory tests falsified: Medical files reopened
The recall of patients at Ste-Anne-de-Beaupré Hospital raises concern. Four of the patients are deceased. So far no link can be made between their deaths and the falsification of diagnostic testing by a medical technologist.

Specialists will study these patient files as soon as next week, says Dr André Roy, director of professional and hospital services of Ste-Anne-de-Beaupré Hospital: « We must know if there is a link between the clinical history and these tests, falsified or not, because we have no proof that they were in fact falsified » he says.

The Ste-Anne-de-Beaupré hospital has recently recalled 384 patients who were tested during the last six months. Twenty-two of these could not be reached.

The hospital found out that an employee falsified many blood and microbiology test results, indicating that they were normal when they were not.

For the moment new assay results were made available for 180 patients. Certain health problems have been noted in 30% of the cases. Dr André Roy says that these patient results show a raise in red blood cells or antibodies, or a decrease in antibodies. Results of 87 blood tests are pending.

The Quebec Provincial Police are investigating to determine if the ex- | I would never falsify patient results because:
1. my peers might be angry with me and will talk about me behind my back.
2. patient care would be compromised.
3. if I get caught I might be arrested.
4. I am committed to providing excellent patient care because it is the ethical thing to do.
5. I might get fired and I need my salary.
6. My employer expects me to do what is right |
employee can be prosecuted for criminal offenses. The provincial order (OPTMQ) is also investigating.

**Scenario 2: Communication**

The technologist has a “panic value” result that she is phoning to the ward, as per laboratory protocol

<table>
<thead>
<tr>
<th>Ward Clerk</th>
<th>4 Medical, Joan speaking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technologist</td>
<td>Hi. This is Sharon from the Central Laboratory. May I speak to Dr. Smith?</td>
</tr>
<tr>
<td>Ward Clerk</td>
<td>I’m sorry. Dr. Smith is on ward rounds. Can I take a message?</td>
</tr>
<tr>
<td>Technologist</td>
<td>I have panic value results on Jane Doe, hospital #9999999.</td>
</tr>
<tr>
<td>Ward Clerk</td>
<td>Go ahead.</td>
</tr>
<tr>
<td>Technologist</td>
<td>PT 98.8</td>
</tr>
<tr>
<td>Ward Clerk</td>
<td>This is my first day here. Can you spell that?</td>
</tr>
<tr>
<td>Technologist</td>
<td>It’s the letters P and T, P as in Peter, T as in Toronto</td>
</tr>
<tr>
<td>Ward Clerk</td>
<td>Could you repeat that?</td>
</tr>
<tr>
<td>Technologist</td>
<td>PT 98.8</td>
</tr>
<tr>
<td>Ward Clerk</td>
<td>Can you spell that?</td>
</tr>
<tr>
<td>Technologist</td>
<td>It’s the letters I N R</td>
</tr>
<tr>
<td>Ward Clerk</td>
<td>Could you repeat that result?</td>
</tr>
<tr>
<td>Technologist</td>
<td>INR 10.25. Is the head nurse available?</td>
</tr>
<tr>
<td>Ward Clerk</td>
<td>No, she’s at a meeting.</td>
</tr>
<tr>
<td>Technologist</td>
<td>Okay, so you’ll give these results to Dr. Smith right away?</td>
</tr>
<tr>
<td>Ward Clerk</td>
<td>Sure.</td>
</tr>
<tr>
<td>Technologist</td>
<td>Thanks. Bye.</td>
</tr>
</tbody>
</table>

The technologist is sure that if even Dr. Smith does get the results in a timely manner, they will certainly not be correct.

| Ward Clerk | The letters P and T; P as in Peter, T as in Toronto |
| Technologist | Could you repeat that result? |
| Ward Clerk | No, she’s at a meeting. |
| Technologist | Okay, so you’ll give these results to Dr. Smith right away? |
| Ward Clerk | Sure. |
| Technologist | Thanks. Bye. |

I would follow up immediately as per laboratory protocol to make sure that Dr. Smith got the correct patient results because:

1. I wouldn’t want anyone to know I didn’t follow the protocols.
2. those are the rules and we have to follow them to keep order in the lab.
3. I want my friends in the lab to know that I am doing a good job.
4. it is important to make sure all patients receive the best possible care.
5. if Dr. Smith complains I could get in trouble if I didn’t follow the protocols
6. I have a moral obligation to provide appropriate care to every patient.

**Scenario 3: MLT Internship**

Third year students were participating in the laboratory placement (stage/internship) portion of their medical laboratory program. Every day of the stage is mandatory. During their rotations they were all required to go to the college one day a week for classes. The hospitals were given a schedule outlining the days that the students would not be present at the hospital. In this scenario, six students were involved, two from each of three hospitals. One of the classes at the school was cancelled after the stage teacher was given the students schedule. As there were changes occasionally, the college teacher just asked the students to pass on the information to the stage teacher. However, the students decided that since they were supposed to be at school and were not expected at the hospital, they would just take the day off.

| Ward Clerk | This is my first day here. Can you spell that? |
| Technologist | It’s the letters P and T, P as in Peter, T as in Toronto |
| Ward Clerk | Could you repeat that result? |
| Technologist | PT 98.8 |
| Ward Clerk | Can you spell that? |
| Technologist | It’s the letters I N R |
| Ward Clerk | Could you repeat that result? |
| Technologist | INR 10.25. Is the head nurse available? |
| Ward Clerk | No, she’s at a meeting. |
| Technologist | Okay, so you’ll give these results to Dr. Smith right away? |
| Ward Clerk | Sure. |
| Technologist | Thanks. Bye. |

As a student I am honest and I follow the rules because:

1. students have a professional responsibility to themselves, their program and their future clients/patients.
2. I want everyone to see that I do the right thing.
3. for the MLT program
Teachers discovered that the students had skipped their stage day and that it involved one whole group of students. The students were confronted and the consensus was that “we’re only students... it’s no big deal”. It was pointed out that there is a “professionalism” portion in their course objectives and that a failure could mean a failure in their internship.

Scenario 4: Preanalytical Phlebotomy Today; October 2007
Tip of the Month: The Last Line of Defense

How many medical mistakes have you prevented because you follow the proper procedure every time without fail? You’ll never know. But when your goal is to prevent mistakes that can threaten the care of your patient, you always play by the rules...you’re a healthcare professional. As such, you refuse to underestimate how your technique can impact test results and the potential it has to change the way the physician manages the patient...

1. the patient might hit me.
2. I would not have filled my moral obligation to provide quality care to every patient.
3. patient care could be compromised.
4. if my supervisor discovers that I hurt a patient I could be suspended.
5. my peers might think that I am incompetent or unprofessional.
6. my employer would think that I do not follow protocols in other cases.

If I perform a phlebotomy poorly:

1. I could fail my internship if I do not do what my teachers want me to do.
2. the terms regarding professionalism that are outlined in the course objectives are for the benefit of all students.
3. I want to pass the professionalism portion of my internship requirements.
4. I must all adhere to the rules.

If I perform a phlebotomy poorly:
Table 3

Stages of the Responses for Each Scenario

<table>
<thead>
<tr>
<th>Staged choices for each scenario represent:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pre-Conventional morality: egocentric; goodness of action dependant on consequences</strong></td>
<td></td>
</tr>
<tr>
<td>Stage 1 is pre-conventional; doing the right thing motivated only by consequences</td>
<td></td>
</tr>
<tr>
<td>Scenario: 1</td>
<td>if I get caught I might get arrested</td>
</tr>
<tr>
<td>2</td>
<td>if Dr. Smith complains I could get in trouble if I didn’t follow the protocols</td>
</tr>
<tr>
<td>3</td>
<td>I could fail my internship if I do not do what my teachers tell me to do</td>
</tr>
<tr>
<td>4</td>
<td>the patient might hit me</td>
</tr>
<tr>
<td>Stage 2 is pre-conventional: motivation to do the right thing is based on self interest only</td>
<td></td>
</tr>
<tr>
<td>Scenario: 1</td>
<td>I might get fired and I need my salary</td>
</tr>
<tr>
<td>2</td>
<td>I wouldn’t want anyone to know I didn’t follow the protocols</td>
</tr>
<tr>
<td>3</td>
<td>I want to pass the professionalism portion of my internship requirements</td>
</tr>
<tr>
<td>4</td>
<td>if my supervisor discovers that I hurt a patient I could get suspended</td>
</tr>
<tr>
<td><strong>Conventional morality: actions judged by societal views and expectations</strong></td>
<td></td>
</tr>
<tr>
<td>Stage 3 is conventional thinking: motivated by doing the right thing to gain the approval of others</td>
<td></td>
</tr>
<tr>
<td>Scenario: 1</td>
<td>my peers might be angry with me and will talk about me behind my back</td>
</tr>
<tr>
<td>2</td>
<td>I want my friends in the lab to know that I am doing a good job</td>
</tr>
<tr>
<td>3</td>
<td>I want everyone to see that I do the right thing</td>
</tr>
<tr>
<td>4</td>
<td>my peers might think that I am incompetent or unprofessional</td>
</tr>
<tr>
<td>Stage 4 is conventional thinking: doing one’s duty; maintaining law and order</td>
<td></td>
</tr>
<tr>
<td>Scenario: 1</td>
<td>my employer expects me to do what is right</td>
</tr>
<tr>
<td>2</td>
<td>those are the rules and we have to follow them to keep order in the lab</td>
</tr>
<tr>
<td>3</td>
<td>for the MLT program to function well, we must all adhere to the rules</td>
</tr>
<tr>
<td>4</td>
<td>my employer would think that I do not follow the protocols in other cases</td>
</tr>
<tr>
<td><strong>Post-conventional morality: principles based on personal perspective</strong></td>
<td></td>
</tr>
<tr>
<td>Stage 5 is post-conventional: based on social contract, the greatest good for the greatest numbers</td>
<td></td>
</tr>
<tr>
<td>Scenario: 1</td>
<td>patient care would be compromised</td>
</tr>
<tr>
<td>2</td>
<td>it is important to make sure all patients receive the best possible care</td>
</tr>
<tr>
<td>3</td>
<td>the terms regarding professionalism that are outlined in the course objectives are for the benefit of all students</td>
</tr>
<tr>
<td>4</td>
<td>patient care could be compromised</td>
</tr>
<tr>
<td>Stage 6 is post-conventional: focuses on universal ethical principles &amp; a sense of personal commitment to them</td>
<td></td>
</tr>
<tr>
<td>Scenario: 1</td>
<td>I am committed to providing excellent patient care because it is the ethical thing to do</td>
</tr>
<tr>
<td>2</td>
<td>I have a moral obligation to provide appropriate care to every patient</td>
</tr>
<tr>
<td>3</td>
<td>students have a professional responsibility to themselves, their program and their future clients/patients</td>
</tr>
<tr>
<td>4</td>
<td>I would not have filled my moral obligation to provide quality care to every patient</td>
</tr>
</tbody>
</table>

Scenario 2, **Communication**, is represented by a phone conversation between a technologist and a ward clerk who is transcribing critical results from the laboratory. What does the technologist do when she is certain that the message has been transmitted incorrectly? This situation also has a potentially serious negative outcome for the patient. If the physician does not receive the correct results in a timely manner, treatment may be delayed or the wrong treatment given.
Scenario 3, **MLT Internship**, represents a situation in which several students skip an internship day, not fulfilling program requirements and being dishonest when asked about it. Although there is no direct patient repercussion from this scenario, the performance of the laboratory team may be compromised. Would technologists who may soon be coworkers of these interns, envision them as potentially ethical and professional colleagues? Would they be willing to work beside them as an equal part of the laboratory team?

Scenario 4, **Preanalytical**, is an excerpt from a phlebotomy magazine, outlining the impact of being a healthcare professional. Not being professional can have a serious negative outcome for the patient. If a technologist is not diligent it is easy for an incorrect sample to be procured or mislabeling to occur. The patient would then be treated based on erroneous results as in scenarios 1 and 2. This is particularly important because most of these types of errors are untraceable.

All of these scenarios typify important issues because the possibility is always present to falsify results, communicate poorly, procure an improper patient sample or behave dishonestly, all with potentially disastrous results. These are but a few of the ethical dilemmas that working technologists face on a daily basis. It is reasonable to assume that anyone that scores low on the moral development scale may well do the wrong thing if they don't consider repercussions, as did the technologist in Scenario 1.

### 3.2.4 Pretesting

The researcher pretested the questionnaire designed for teachers (see Appendix 2) at Dawson College using a teacher designated by the Chairperson of the MLT program as a respondent. One minor change was made on the questionnaire.
based on the teacher’s feedback. Updated surveys were printed in English and in French.

The questionnaire for the MLT students was pretested with a whole class of 16 students who volunteered to participate. The teacher’s instructions asked for the students to comment on the clarity of wording and to suggest improvements. The students filled out the surveys and the only feedback that they gave was that they liked the examples. The time required from the students was less than 30 minutes. The survey was not revised because the feedback was positive and the time required to complete the survey seemed reasonable.

3.2.5 Collection of Data

All MLT program students are members of the CSMLS, the professional society for medical laboratory technologists Canada-wide. The researcher contacted the Director of Research of the Canadian Society for Medical Laboratory Science, asking for a letter of support for the project. Her support was granted and as a result the study was approved by the CSMLS Board of Directors. The letter, written by Kurt Davis (see Appendix 4), the Executive Director of CSMLS, was included in all survey packages. The CSMLS gave assistance in the form of mailing surveys to randomly selected 2 year post graduates which was greatly appreciated.

The researcher attempted to contact the schools directly by telephone to ask the Program Directors of the MLT Programs to support this research project. This task proved to be futile because the teachers were impossible to connect with immediately and therefore contact would have required many return long-distance calls. An introductory letter was composed instead, in English for the English institutions and in French for the French CEGEPs in Quebec and one French
institution in New Brunswick. Subsequently the revised questionnaires were distributed by mail.

The researcher contacted the chairpersons of all of the schools initially by email, including a cover letter from Kurt Davis, advocating that teachers and students take part in the study. Teachers were solicited for their support, including their participation in filling out the teacher questionnaire and the administration of the questionnaires to their students. Packages, including introductory letters explaining the study (see Appendix 5), the questionnaires, and consent forms (see Appendix 3 for students consent forms and Appendix 6 for teachers consent forms), were mailed to the schools and directly to technologists 2 years post graduate. See Table 4 for the contents of the survey packages. All were returned to the researcher via Canada Post in pre-addressed, stamped envelopes. Four distinct packages were made, each requiring different wording in the consent forms.

| Table 4 |
| Contents of Survey Packages |

Survey packages distributed to teachers, students and graduates of MLT programs across Canada. March 2008

<table>
<thead>
<tr>
<th>teachers</th>
<th>1st year students</th>
<th>end of program</th>
<th>2 yrs post grad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introductory letter</td>
<td>Introductory letter</td>
<td>Introductory letter</td>
<td>Introductory letter</td>
</tr>
<tr>
<td>Explanatory statement</td>
<td>Explanatory statement</td>
<td>Explanatory statement</td>
<td>Explanatory statement</td>
</tr>
<tr>
<td>Instructions: teachers</td>
<td>Instructions: students</td>
<td>Instructions: students</td>
<td>Instructions: graduates</td>
</tr>
<tr>
<td>Consent form: teachers</td>
<td>Consent form: 1st year</td>
<td>Consent form: 3rd year</td>
<td>Consent form: post grads</td>
</tr>
<tr>
<td>Survey for teachers</td>
<td>Survey: students/graduates</td>
<td>Survey: students/graduates</td>
<td>Survey: students/graduates</td>
</tr>
</tbody>
</table>

To maintain confidentiality, each student was given a number that only the researcher has access to, allowing for the tracking of students moral development. Telephone interactions and the collected raw data remain strictly confidential.

Surveys were distributed to all schools that offer MLT training across Canada, 25 in all, with an equal number of surveys assigned to each school. This represents 10 French schools and 15 English schools. Responses were received from 7 English
programs and 8 French programs. It is noted that the overall response rate from the total number of French schools was 80% and from the total number of English schools was 47%. Overall 119 English and 105 French surveys were received.

Post graduates were chosen randomly from the CSMLS member mailing list and surveys were sent to them by the CSMLS. Because the overall distribution of English to French students across Canada is approximately 3 to 1, 150 English surveys were sent to graduates from English programs and 50 French surveys were sent to graduates from French programs. The response rate for the mailed surveys was representative of the total number of surveys that were sent out. Responses were received from graduates from seventeen schools. See Table 5 for numbers of English and French technologists across Canada.

Table 5

Numbers of English and French Technologists Across Canada

<table>
<thead>
<tr>
<th>Members</th>
<th>English</th>
<th>French</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSMLB</td>
<td>11795</td>
<td>826</td>
<td>12621</td>
</tr>
<tr>
<td>Student</td>
<td>579</td>
<td>104</td>
<td>683</td>
</tr>
<tr>
<td>OPTMQ</td>
<td>165</td>
<td>4119</td>
<td>4284</td>
</tr>
<tr>
<td>Total</td>
<td>12539</td>
<td>5049</td>
<td>17588</td>
</tr>
</tbody>
</table>

Surveys for teachers were sent to 25 educators, one per program. Student surveys were sent to 400 students, 200 in first year and 200 at the end of program, who were surveyed at their respective colleges. Two hundred (200) graduates were surveyed by mail. Institutions offering Medical Laboratory Technology Accredited Training Programs are listed in Appendix 7. All respondents read the purpose of the study and signed the consent form before they proceeded to participate in the study. One teacher per school completed the survey for teachers and administered the
student surveys. Fifteen (15) teachers and 40 post graduates responses were returned via Canada Post in pre-addressed, stamped envelopes.

The return rates of the surveys were as follows: one hundred from 1st year students; eighty-four from the end of program students; forty for post graduates, of which 5 were returned because of incorrect addresses; fifteen from teachers. One school returned student surveys but no teacher survey to accompany it. One school sent 2 teacher surveys because they have 2 MLT programs running.

First year students were asked if they were willing to participate in a longitudinal study necessitating giving their name to CSMLS when they are 2 years post graduate. Having the names of the participants will enable CSMLS to send out the surveys (in 2012). In the proposed longitudinal study the first year students would be tracked and resurveyed at the end of their programs and two years post graduation. This coincides with the upgrade of the CSMLS competencies (see Appendix 8), with an increased emphasis on ethics and professionalism. These will be incorporated into the 2010 examinations.

Confidentiality was assured by giving each student a number that only the researcher has access to and would only be used in the event that this will become a longitudinal study allowing for the tracking of students' moral development. No post-study debriefing was necessary.

3.2.6 Analysis of Data

All data from both the teachers' and the students' surveys were entered into the SPSS (Statistical Package for Social Sciences) program. Tables were created from Crosstabulations, One way Anova and frequency tables of collected data to document
what types of ethics courses were taught, and whether students know what types of ethics education they receive. Students' stages of moral development were calculated for all choices merely as a means to compare survey groups. Figures were added to demonstrate where responses show differences in moral reasoning. Crosstabulations, Pearson's Chi-Square Tests and Oneway Anova were utilized to calculate if there were significant differences between groups of respondents or the scenario choices. Data was presented followed by discussion of the findings.
CHAPTER FOUR
PRESENTATION OF FINDINGS

According to CSMLS statistics on 2008 members, 85% of student members are English and 15% are French. The overall statistics including members and students show that there are 94% English and 6% French CSMLS members across Canada. However, in Quebec, all working technologists are required to be members of the provincial order, OPTMQ (Ordre professionale des techniciens medicaux de Québec) and many of these belong to CSMLS as well. The 2008 members statistics from OPTMQ show that there are 96% French and 4% English members in Québec. Combined figures show that there are a total of 17,588 registered members across Canada, including overlap, of which 72% are English and 28% are French.

Overall the number of males responding to the surveys distributed in this study was 14% and the number of females was 86%. Broken down by year: in the 1st year cohort there were 16% male and 84% female respondents; at the end of program cohort there were 11% male and 89% female respondents; of the 2 year post graduate respondents 18% were male and 82% were female. This is approximately representative of the number of males and females in the profession, based on the statistics compiled by CSMLS and OPTMQ.

4.1 ETHICS EDUCATION

The data from the teachers’ surveys and the statistical data from the students’ surveys regarding the types of ethics education they received were entered into the SPSS (Statistical Package for Social Sciences) program. Fourteen out of twenty-five schools are represented. Table 6 summarizes the data, showing that teachers from three out of fourteen schools say they offer mandatory general ethics courses while all fourteen schools offer mandatory medical ethics courses.
When students were asked, 9% (15) of students/graduates (172) agreed that they receive mandatory general ethics courses, 28% (49) agreed that they do not receive mandatory general ethics courses and 63% (108) disagreed or did not know. When asked if they receive compulsory medical ethics courses, 50.6% (87) agreed, and 49.4% (85) disagreed or did not know. Respondents from one school reported

**Table 6**

**Summary of Ethics Courses verses Students Perceptions**

<table>
<thead>
<tr>
<th>Case Processing</th>
<th>Summary of Ethics Courses taught verses students' perception of what ethics courses were taught</th>
<th>03/06/03</th>
</tr>
</thead>
<tbody>
<tr>
<td>School</td>
<td>Teacher yes/no</td>
<td>Student yes/no</td>
</tr>
<tr>
<td><strong>Mandatory general ethics courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U ALB</td>
<td>no</td>
<td>6</td>
</tr>
<tr>
<td>NAIT</td>
<td>no</td>
<td>4</td>
</tr>
<tr>
<td>CCNB</td>
<td>yes</td>
<td>5</td>
</tr>
<tr>
<td>C of the NA</td>
<td>no</td>
<td>6</td>
</tr>
<tr>
<td>St Clair</td>
<td>no</td>
<td>18</td>
</tr>
<tr>
<td>Chicoutimi</td>
<td>no</td>
<td>6</td>
</tr>
<tr>
<td>Rimouski</td>
<td>no</td>
<td>2</td>
</tr>
<tr>
<td>Ste-Foy</td>
<td>no</td>
<td>10</td>
</tr>
<tr>
<td>St-Jean</td>
<td>yes</td>
<td>11</td>
</tr>
<tr>
<td>St-Jerome</td>
<td>no</td>
<td>4</td>
</tr>
<tr>
<td>Sherbrooke</td>
<td>no</td>
<td>7</td>
</tr>
<tr>
<td>Shawinigan</td>
<td>yes</td>
<td>4</td>
</tr>
<tr>
<td>Dawson</td>
<td>no</td>
<td>10</td>
</tr>
<tr>
<td>SI for AS&amp;T</td>
<td>no</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>98</td>
</tr>
<tr>
<td><strong>Mandatory medical ethics courses</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>U ALB</td>
<td>yes</td>
<td>4</td>
</tr>
<tr>
<td>NAIT</td>
<td>yes</td>
<td>4</td>
</tr>
<tr>
<td>CCNB</td>
<td>yes</td>
<td>5</td>
</tr>
<tr>
<td>C of the NA</td>
<td>yes</td>
<td>11</td>
</tr>
<tr>
<td>St Clair</td>
<td>yes</td>
<td>14</td>
</tr>
<tr>
<td>Chicoutimi</td>
<td>yes</td>
<td>6</td>
</tr>
<tr>
<td>Rimouski</td>
<td>yes</td>
<td>2</td>
</tr>
<tr>
<td>Ste-Foy</td>
<td>yes</td>
<td>12</td>
</tr>
<tr>
<td>St-Jean</td>
<td>yes</td>
<td>3</td>
</tr>
<tr>
<td>St-Jerome</td>
<td>yes</td>
<td>6</td>
</tr>
<tr>
<td>Sherbrooke</td>
<td>yes</td>
<td>3</td>
</tr>
<tr>
<td>Shawinigan</td>
<td>yes</td>
<td>4</td>
</tr>
<tr>
<td>Dawson</td>
<td>yes</td>
<td>5</td>
</tr>
<tr>
<td>SI for AS&amp;T</td>
<td>yes</td>
<td>13</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>87</td>
</tr>
</tbody>
</table>

incorrectly that they did not receive any ethics courses. Overall students answered correctly, according to the teacher responses, 44% of the time.
Teachers were asked in which semester ethics courses were taught. The participating schools' programs varied from 2 years to 4 years in length and therefore the responses were not utilized. See Appendix 9 for the distribution of ethics courses throughout the training programs.

There were too few teacher surveys to split by language but generally English and French schools offer similar ethics training but not in the same semesters. French schools favored ethics courses taught by philosophers. English schools favored courses taught by health care providers. Case studies were used more often by English schools and more often in assignments. About 87% of teachers agreed that ethics training is a high priority and most teachers indicated that ethics training is adequate in their programs.

4.2 STAGES OF MORAL REASONING

Respondents were asked to choose, in order of relevance to them, the best three responses to the scenario. Table 7 shows the students' stages of moral reasoning during 1st year, end of program and 2 years post graduate. Overall, choices one and two correlated with the best choice in terms of moral development. A reminder: a response that is rated 5.0-6 is considered to be post-conventional, the highest in moral development; a number ranging from 3.0-4.9 is considered to be conventional, the most common range found in adults; a range of 1.0-2.9 is considered to be pre-conventional or the lowest in moral development. Kohlberg did not consider a change in stage lower than 0.5 to be significant. (Patenaude, J., Niyonsenga, T., & Fafard, D., 2003)

Looking at the bottom of the table, in choice #1, overall, Kohlberg's Stage increased from 5.29 in first year to 5.33 at the end of program to 5.39 2 years post graduation, an increase in the highest mean value of 0.10. In choice #2 there was an
### Table 7

<table>
<thead>
<tr>
<th>Students Stages of Moral Reasoning by Program Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kohlberg’s Stages</td>
</tr>
<tr>
<td>Scenario .choice</td>
</tr>
<tr>
<td>PR 1.1</td>
</tr>
<tr>
<td>Com 2.1</td>
</tr>
<tr>
<td>Int 3.1</td>
</tr>
<tr>
<td>PA 4.1</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td>PR 1.2</td>
</tr>
<tr>
<td>Com 2.2</td>
</tr>
<tr>
<td>Int 3.2</td>
</tr>
<tr>
<td>PA 4.2</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
</tr>
<tr>
<td>PR 1.3</td>
</tr>
<tr>
<td>Com 2.3</td>
</tr>
<tr>
<td>Int 3.3</td>
</tr>
<tr>
<td>PA 4.3</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
</tr>
</tbody>
</table>

**Overall**

| 1\(^{st}\) choice | 5.29 | 5.33 | 5.39 |
| 2\(^{nd}\) choice | 4.98 | 5.13 | 5.02 |
| 3\(^{rd}\) choice | 3.63 | 3.66 | 3.57 |
| **Mean** | **4.63** | **4.71** | **4.66** | **0.08** |

Legend: PR=Patient Recall, Com=Communication, Int=Internship, PA=Preanalytical

*Range = spread between highest mean value and lowest mean value.

An increase in the mean in 1\(^{st}\) year from 4.98 to 5.13 at the end of the program and a decrease to 5.02 2 years postgraduate but this is still higher than 1\(^{st}\) year and is a spread between mean values of 0.15. In the third choice an increase from 3.63 in 1\(^{st}\) year to 3.66 at the end of program and a decrease at the end of program to 3.57, an overall spread of 0.09. The overall averages showed a slight increase from 4.63 in year 1 to 4.71 at the end of program and a slight dip back down to 4.66 2 years post graduate, but still 0.03 higher than 1\(^{st}\) year. The overall spread between mean values was 0.08. Although minor variations are demonstrated among responses, the One way Anova reveals that there are no significant differences in 1\(^{st}\), 2\(^{nd}\) or 3\(^{rd}\) choices among program years. (See Appendix 10)
Figure 1 represents the charted findings by year. In all graphs, the red lines represent the 1st choice answers, the green line represents the 2nd choice answers and

<table>
<thead>
<tr>
<th>Stages for question 1 responses</th>
<th>Stages for question 2 responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>1.1 Patient Recall we could never...</td>
<td>2.1 Communicator I would follow up...</td>
</tr>
<tr>
<td>1.2 Patient Recall we said never...</td>
<td>2.2 Communicator I would follow up...</td>
</tr>
<tr>
<td>1.3 Patient Recall we said never...</td>
<td>2.3 Communicator I would follow up...</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Program year</td>
<td>Program year</td>
</tr>
<tr>
<td>1st year</td>
<td>1st year</td>
</tr>
<tr>
<td>2 years post grad</td>
<td>2 years post grad</td>
</tr>
<tr>
<td>End of program</td>
<td>End of program</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Stages for question 3 responses,</th>
<th>Stages for question 4 responses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>3.1 Internship As a student farm.</td>
<td>4.1 Psychoanalytical Fixing anxiousness</td>
</tr>
<tr>
<td>3.2 Internship as a supervisor...</td>
<td>4.2 Psychoanalytical Fixing anxiousness</td>
</tr>
<tr>
<td>3.3 Internship As a student farm.</td>
<td>4.3 Psychoanalytical Fixing anxiousness</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Program year</td>
<td>Program year</td>
</tr>
<tr>
<td>1st year</td>
<td>1st year</td>
</tr>
<tr>
<td>2 years post grad</td>
<td>2 years post grad</td>
</tr>
<tr>
<td>End of program</td>
<td>End of program</td>
</tr>
</tbody>
</table>

**Figure 1.** The differences of responses for each scenario by stages and choices.
the blue line represents the 3rd choice answers of the respondents. In Scenarios 1, 2 and 4, the choices of students at the end of program are either the same or higher than those in their first year. However, for Scenario 3, across all years, it is demonstrated that the 2nd choice value is much lower than for the others and, in fact, is more in line with the third choices in all categories. Although not significant overall, it is interesting that this is the question that deals with the ethical behaviour of students which was mentioned in the introduction as a contributing factor for undertaking the study.

Figure 2 shows the 3rd choice answers for all respondents for each Scenario. First (1st) and 2nd choice answers were not selected because of the bias demonstrated by utilizing a quantitative research methodology; the 3rd choice answers more closely resemble Kohlberg's stages of moral development found in earlier qualitative studies. Figure 2 demonstrates that although the overall stage of moral development is not statistically significant, there are slight variations in the students' perceptions on the different scenarios. It is interesting to note that the graphs show clearly that 1st year, end of program and 2 year post graduates all answered to the scenarios in a like manner. In scenarios 1, 2 and 4, Stage 4 (Conventional) is predominant. In scenario 1, 31% of all respondents, regardless of year category, chose pre-conventional stages of morality. In scenario 2, respondents in 1st year and end of program chose pre-conventional stages 10% and 4% respectively while the post graduates chose 16% pre-conventional stages. In Scenario 3 Stages 4 and 5 are predominant (59 – 67%), and pre-conventional stages range from 29% in 1st year, to 30% at the end of program and 27% post graduate. In scenario 4, 18% of 1st year, 17% of end of program and 15% of post graduate respondents chose pre-conventional stages. Stage 3, conventional morality, was chosen 14% of the time by 1st year and end of program while 18% of post graduates chose stage 3.
Scenario 1.3 I would never falsify patient results because:

Scenario 2.3 I would follow up immediately as per laboratory protocol to make sure that Dr. Smith got the correct patient results because:

Scenario 3.3 As a student I am honest and I follow the rules because:

Scenario 4.3 If I perform a phlebotomy poorly:

Figure 2. Third choice answers for all respondents for each question
Further, if we look at Table 8, representing all of the numbers for Kohlberg’s Stages, compared by program year, mother tongue, gender and age range, we see that there are no significant differences between group categories and that the largest difference is in age range, >40, which represents only 3 participants.

Table 8
Kohlberg’s Stages for Program Year, Mother Tongue, Gender and Age Range

<table>
<thead>
<tr>
<th>Program year</th>
<th>Choice 1</th>
<th>Choice 2</th>
<th>Choice 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td>5.29</td>
<td>4.97</td>
<td>3.63</td>
</tr>
<tr>
<td>2 years post grad</td>
<td>5.39</td>
<td>5.01</td>
<td>3.57</td>
</tr>
<tr>
<td>End of program</td>
<td>5.33</td>
<td>5.13</td>
<td>3.66</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mother tongue</th>
<th>Choice 1</th>
<th>Choice 2</th>
<th>Choice 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>5.33</td>
<td>5.09</td>
<td>3.59</td>
</tr>
<tr>
<td>French</td>
<td>5.31</td>
<td>4.98</td>
<td>3.68</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>Choice 1</th>
<th>Choice 2</th>
<th>Choice 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>5.19</td>
<td>4.95</td>
<td>3.73</td>
</tr>
<tr>
<td>Female</td>
<td>5.35</td>
<td>5.06</td>
<td>3.61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age range</th>
<th>Choice 1</th>
<th>Choice 2</th>
<th>Choice 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-21</td>
<td>5.24</td>
<td>5.01</td>
<td>3.75</td>
</tr>
<tr>
<td>22-26</td>
<td>5.37</td>
<td>5.05</td>
<td>3.63</td>
</tr>
<tr>
<td>27-30</td>
<td>5.27</td>
<td>5.05</td>
<td>3.71</td>
</tr>
<tr>
<td>31-40</td>
<td>5.39</td>
<td>5.06</td>
<td>3.44</td>
</tr>
<tr>
<td>&gt;40</td>
<td>4.83</td>
<td>5.42</td>
<td>3.58</td>
</tr>
<tr>
<td>Total</td>
<td>5.32</td>
<td>5.04</td>
<td>3.63</td>
</tr>
</tbody>
</table>

4.3 CROSSTABULATIONS AND STATISTICAL ANALYSIS

Crosstabulations were performed on SPSS for 1st, 2nd and 3rd choice answers on each of the 4 scenarios including Patient Recall, Communication, Internship and Preanalytical and for all 4 variables including program year, gender, age range and mother tongue, 48 in all. Two set of statistics were chosen to show as examples for each scenario for program year, which was the initial variable chosen for the study.
Question 1.1 was chosen as a baseline for each variable and Question 3.2 was chosen because it demonstrated the most interesting findings. Although there was no statistical difference among program years Kohlberg's stage of moral development is much lower for the 2nd choice answer in Scenario 3 than in Scenarios 1, 2 and 4. (See Table 7)

4.3.1 Program Year

The overall number of respondents by year of schooling was 44.6% from 1st year, 37.5% from the end of program and 17.9% of post graduates. Oneway Anova shows that there is no significant statistical differences in either 1st, 2nd or 3rd choice answers among MLT program years. Crosstabulations and charts show that distributions are similar in all cases. For example when examining question 1.1, crosstabulations among 1st year, end of program and post graduates respondents' percentages are as follows: post-conventional moral development was chosen by 1st year students 97% of the time, end of program students 100% of the time and post graduates 97.5% of the time. See Table 9 for the breakdown of percentages. Using question 3.2 which demonstrated interesting findings it is noted that there are statistically insignificant differences, among program year respondents. In this case post-conventional moral development was demonstrated by 1st year students 50.5% of the time, end of program students 52.4% of the time and post graduates 41% of the time. Conventional development was demonstrated by 1st year students 14% of the time, end of program students 27.4% of the time and post graduates 30.8% of the time. Pre-conventional development moral development was demonstrated by 1st year students 35.3% of the time, end of program students 20.3% of the time and post graduates 28.2% of the time. Figure 3 shows actual numbers of respondents that chose a response that reflected their stage of moral development and correspond to the crosstabulations in Tables 9 and 10. Note that the proportions are approximately the same taking into consideration the difference in total numbers.
**Table 9**

**Question 1.1 Crosstabulations Program Year: Patient Recall**

1.1 I would never falsify patient results because:

<table>
<thead>
<tr>
<th>Program year</th>
<th>Kohlberg's Stages</th>
<th>Count</th>
<th>1</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td></td>
<td></td>
<td>1</td>
<td>2</td>
<td>61</td>
<td>36</td>
<td>100</td>
</tr>
<tr>
<td>% within Program year</td>
<td>1.00%</td>
<td>2.00%</td>
<td>61.00%</td>
<td>36.00%</td>
<td>100.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 years post grad</td>
<td>Count</td>
<td></td>
<td>1</td>
<td>26</td>
<td>13</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>% within Program year</td>
<td>2.50%</td>
<td></td>
<td>65.00%</td>
<td>32.50%</td>
<td>100.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of program</td>
<td>Count</td>
<td></td>
<td>62</td>
<td>22</td>
<td>84</td>
<td></td>
<td></td>
</tr>
<tr>
<td>% within Program year</td>
<td>73.80%</td>
<td></td>
<td>26.20%</td>
<td>100.00%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td></td>
<td>2</td>
<td>2</td>
<td>149</td>
<td>71</td>
<td>224</td>
</tr>
<tr>
<td>% within Program year</td>
<td>0.90%</td>
<td></td>
<td>66.50%</td>
<td>31.70%</td>
<td>100.00%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 10**

**Question 3.2 Crosstabulations Program Year: Internship**

3.2 As a student I am honest:

<table>
<thead>
<tr>
<th>Program year</th>
<th>Kohlberg's Stages</th>
<th>Count</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st year</td>
<td></td>
<td></td>
<td>11</td>
<td>24</td>
<td>14</td>
<td>42</td>
<td>6</td>
<td>99</td>
<td></td>
</tr>
<tr>
<td>% within Program year</td>
<td>11.10%</td>
<td></td>
<td>24.20%</td>
<td>14.10%</td>
<td>42.40%</td>
<td>8.10%</td>
<td>100.00%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 years post grad</td>
<td>Count</td>
<td></td>
<td>3</td>
<td>8</td>
<td>1</td>
<td>11</td>
<td>3</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td>% within Program year</td>
<td>7.70%</td>
<td></td>
<td>20.50%</td>
<td>2.60%</td>
<td>28.20%</td>
<td>33.30%</td>
<td>7.70%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>End of program</td>
<td>Count</td>
<td></td>
<td>4</td>
<td>13</td>
<td>3</td>
<td>20</td>
<td>33</td>
<td>11</td>
<td>84</td>
</tr>
<tr>
<td>% within Program year</td>
<td>4.80%</td>
<td></td>
<td>15.50%</td>
<td>3.60%</td>
<td>23.80%</td>
<td>39.30%</td>
<td>13.10%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td></td>
<td>18</td>
<td>45</td>
<td>4</td>
<td>45</td>
<td>88</td>
<td>22</td>
<td>222</td>
</tr>
<tr>
<td>% within Program year</td>
<td>8.10%</td>
<td></td>
<td>20.30%</td>
<td>1.80%</td>
<td>20.30%</td>
<td>39.60%</td>
<td>9.90%</td>
<td>100.00%</td>
<td></td>
</tr>
</tbody>
</table>
4.3.2 Gender

Overall the number of males responding was 14% and the number of females was 86%. One way ANOVA shows that there is no significant statistical differences in either 1st, 2nd or 3rd choices between males and female respondents. Crosstabulations and charts show that distributions are similar in all cases. For example when examining question 1.1, Crosstabulations between male:female respondents percentages are as follows: post-conventional moral development was chosen by males 93.7% of the time and females 99% of the time. Using question 3.2 which demonstrated interesting findings it is noted that there is only slight difference between male and female respondents. In this case post-conventional moral development was demonstrated by 47% of males and 50% of females, conventional development by 16% of males and 23% of females and pre-conventional development by 38% of males and 27% of females. If we look at Figure 4 we see graphically the numbers of males and females that chose the answers that reflected each stage of moral development and correspond to the crosstabulations in Tables.
11 and 12. Note that the proportions are approximately the same taking into consideration the difference in total numbers. Figure 4 shows actual numbers of respondents that chose a response that reflected their stage of moral development according to gender.

**Table 11**

**Question 1.1 Crosstabulations Gender: Patient Recall**

1.1 I would never falsify patient results because:

<table>
<thead>
<tr>
<th>Sex</th>
<th>Stage:</th>
<th>1</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Count</td>
<td>1</td>
<td>1</td>
<td>17</td>
<td>13</td>
<td>32</td>
</tr>
<tr>
<td>% within sex</td>
<td>3.10%</td>
<td>3.10%</td>
<td>53.10%</td>
<td>40.60%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>Count</td>
<td>1</td>
<td>1</td>
<td>132</td>
<td>58</td>
<td>192</td>
</tr>
<tr>
<td>% within sex</td>
<td>0.50%</td>
<td>0.50%</td>
<td>68.80%</td>
<td>31.20%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>2</td>
<td>2</td>
<td>149</td>
<td>71</td>
<td>224</td>
</tr>
<tr>
<td>% within sex</td>
<td>0.90%</td>
<td>0.90%</td>
<td>66.50%</td>
<td>31.70%</td>
<td>100.00%</td>
<td></td>
</tr>
</tbody>
</table>

**Table 12**

**Question 3.2 Crosstabulations Gender: Internship**

3.2 As a student I an honest and follow the rules because:

<table>
<thead>
<tr>
<th>Sex</th>
<th>stage</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Count</td>
<td>4</td>
<td>8</td>
<td>1</td>
<td>4</td>
<td>12</td>
<td>3</td>
<td>32</td>
</tr>
<tr>
<td>% within sex</td>
<td>12.50%</td>
<td>25.00%</td>
<td>3.10%</td>
<td>12.50%</td>
<td>37.50%</td>
<td>9.40%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>Count</td>
<td>14</td>
<td>37</td>
<td>3</td>
<td>41</td>
<td>76</td>
<td>19</td>
<td>190</td>
</tr>
<tr>
<td>% within sex</td>
<td>7.40%</td>
<td>19.50%</td>
<td>1.60%</td>
<td>21.60%</td>
<td>40.00%</td>
<td>10.00%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>18</td>
<td>45</td>
<td>4</td>
<td>45</td>
<td>88</td>
<td>22</td>
<td>222</td>
</tr>
<tr>
<td>% within sex</td>
<td>8.10%</td>
<td>20.30%</td>
<td>1.80%</td>
<td>20.30%</td>
<td>39.60%</td>
<td>9.90%</td>
<td>100.00%</td>
<td></td>
</tr>
</tbody>
</table>
4.3.3 Mother Tongue

Also, in Canada, because the English/French distribution of MLTs in 2006 was roughly 75:25, comparisons were undertaken to see if there are differences between English and French respondents. One hundred fifty (150) English surveys were sent to graduates from English programs and 50 French surveys were sent to graduates from French programs. The response rate for the mailed surveys was representative of the total number of surveys that were sent out, 30 English and 10 French respondents. Responses were received from graduates from seventeen schools. It is noted that the overall response rate from the total number of French schools was 80% and from the total number of English schools was 47%. Overall 224 surveys were received, 53% (119) from English schools and 47% (105) from French schools.
Oneway Anova shows that there is no significant statistical differences in either 1st, 2nd or 3rd choices between English and French respondents. Crosstabulations and charts demonstrate that distributions for English and French respondents are similar in all cases. (See Table 13 and Table 14) For example, when examining question 1.1, crosstabulation percentages are as follows: post-conventional moral development was chosen by both English and French respondents 98% of the time and that pre-conventional and conventional responses were negligible. Using question 3.2 which demonstrated interesting findings it is noted that there are slight differences between English and French respondents. In this case post-conventional moral development was demonstrated by 53% of English and 45% of French; conventional development by 23% of English and, 21% of French and pre-conventional development by 24% of English and 34% of French respondents. If we look at Figure 5 we see graphically the numbers of males and females that chose each stage of moral development and correspond to the crosstabulations in Tables 13 and 14. Note that the proportions are similar taking into consideration the difference in total numbers.

**Table 13**

**Question 1.1 Crosstabulations Mother Tongue: Patient Recall**

<table>
<thead>
<tr>
<th>Mother tongue</th>
<th>Stage</th>
<th>1</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Count</td>
<td>2</td>
<td>81</td>
<td>36</td>
<td>119</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within mother tongue</td>
<td>1.70%</td>
<td>68.10%</td>
<td>30.30%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>French</td>
<td>Count</td>
<td>1</td>
<td>68</td>
<td>35</td>
<td>105</td>
<td></td>
</tr>
<tr>
<td></td>
<td>% within mother tongue</td>
<td>1.90%</td>
<td>64.80%</td>
<td>33.30%</td>
<td>100.00%</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>2</td>
<td>2</td>
<td>149</td>
<td>71</td>
<td>224</td>
</tr>
<tr>
<td></td>
<td>% within mother tongue</td>
<td>0.90%</td>
<td>0.90%</td>
<td>66.50%</td>
<td>31.70%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
Table 14
Question 3.2 Crosstabulations Mother Tongue: Internship

3.2 As a student I am honest:

<table>
<thead>
<tr>
<th>mother tongue</th>
<th>stage</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>7</td>
<td>21</td>
<td>3</td>
<td>24</td>
<td>49</td>
<td>14</td>
<td>118</td>
</tr>
<tr>
<td>English</td>
<td>% within mother tongue</td>
<td>5.90%</td>
<td>17.80%</td>
<td>2.50%</td>
<td>20.30%</td>
<td>41.50%</td>
<td>11.90%</td>
<td>100.00%</td>
</tr>
<tr>
<td>French</td>
<td>Count</td>
<td>11</td>
<td>24</td>
<td>1</td>
<td>21</td>
<td>39</td>
<td>8</td>
<td>104</td>
</tr>
<tr>
<td></td>
<td>% within mother tongue</td>
<td>10.60%</td>
<td>23.10%</td>
<td>1.00%</td>
<td>20.20%</td>
<td>37.50%</td>
<td>7.70%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>18</td>
<td>45</td>
<td>4</td>
<td>45</td>
<td>88</td>
<td>22</td>
<td>222</td>
</tr>
<tr>
<td></td>
<td>% within mother tongue</td>
<td>8.10%</td>
<td>20.30%</td>
<td>1.80%</td>
<td>20.30%</td>
<td>39.60%</td>
<td>9.90%</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Figure 5. Number of respondents graphically according to mother tongue and Scenarios: Patient Recall and Internship

4.3.4 Age Range

Traditionally, the students in MLT have a varied age range. In this case, 75% of the participants were younger than 27 years old while 42% of the post graduates were under 27 years old; 13% of students were over the age of 31 while 40% of the
post graduates were over the age of 31. The three people over the age range of 40 were included in the >31 category.

Oneway Anova shows that there is no significant statistical differences in either 1st, 2nd or 3rd choices among age ranges. Crosstabulations and charts show that distributions are similar in all cases. For example when examining question 1.1, crosstabulations amongst different age categories of respondents percentages are as follows: post-conventional moral development was chosen by ages 17 – 21 98% of the time, ages 22-26 99% of the time, ages 27-30 96% of the time and >31 97% of the time. Using question 3.2 which demonstrated interesting findings it is noted that there is a noticeable spread between ages of respondents. In this case post-conventional moral development was demonstrated by ages 17 – 21 42% of the time, ages 22-26 53% of the time, ages 27-30 42% of the time and over age 31 55% of the time, conventional development by ages 17 – 21 26% of the time, ages 22-26 19% of the time, ages 27-30 35% of the time and over age 31 16% of the time and pre-conventional development by ages17 – 21 32% of the time, ages 22-26 27% of the time, ages 27-30 23% of the time and over age 31 29% of the time. If we look at Figure 6 we see graphically the numbers by ages that chose the answers that reflected each stage of moral development and correspond to the crosstabulations in Tables 15 and 16. Figure 6 shows actual numbers of respondents that chose a response that reflected their stage of moral development as determined by Kohlberg.
Table 15

Question 1.1 Crosstabulations Age: Patient Recall

1.1 I would never falsify patient results because:

<table>
<thead>
<tr>
<th>age range</th>
<th>Stage</th>
<th>1</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-21</td>
<td>Count</td>
<td>1</td>
<td>44</td>
<td>18</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>22-26</td>
<td>Count</td>
<td>1</td>
<td>62</td>
<td>27</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>27-30</td>
<td>Count</td>
<td>1</td>
<td>19</td>
<td>7</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>&gt;31</td>
<td>Count</td>
<td>1</td>
<td>21</td>
<td>16</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>Count</td>
<td>2</td>
<td>2</td>
<td>146</td>
<td>68</td>
<td>218</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>age range</th>
<th>% within age range</th>
<th>1.60%</th>
<th>69.80%</th>
<th>28.60%</th>
<th>100.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-21</td>
<td></td>
<td>1.60%</td>
<td>69.80%</td>
<td>28.60%</td>
<td>100.00%</td>
</tr>
<tr>
<td>22-26</td>
<td></td>
<td>1.10%</td>
<td>68.90%</td>
<td>30.00%</td>
<td>100.00%</td>
</tr>
<tr>
<td>27-30</td>
<td></td>
<td>3.70%</td>
<td>70.40%</td>
<td>25.90%</td>
<td>100.00%</td>
</tr>
<tr>
<td>&gt;31</td>
<td></td>
<td>2.60%</td>
<td>55.30%</td>
<td>42.10%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>0.90%</td>
<td>0.90%</td>
<td>67.00%</td>
<td>31.20%</td>
</tr>
</tbody>
</table>

Table 16

Question 3.2 Crosstabulations Age: Internship

3.2 As a student I am honest:

<table>
<thead>
<tr>
<th>age range</th>
<th>Count</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-21</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>9</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>22-26</td>
<td>5</td>
<td>19</td>
<td>2</td>
<td>15</td>
<td>37</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>27-30</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>7</td>
<td>11</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>&gt;31</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>17</td>
<td>4</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
<td>43</td>
<td>4</td>
<td>44</td>
<td>85</td>
<td>22</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>age range</th>
<th>% within age range</th>
<th>12.90%</th>
<th>19.40%</th>
<th>25.80%</th>
<th>32.30%</th>
<th>9.70%</th>
<th>100.00%</th>
</tr>
</thead>
<tbody>
<tr>
<td>17-21</td>
<td></td>
<td>12.90%</td>
<td>19.40%</td>
<td>25.80%</td>
<td>32.30%</td>
<td>9.70%</td>
<td>100.00%</td>
</tr>
<tr>
<td>22-26</td>
<td></td>
<td>5.60%</td>
<td>21.10%</td>
<td>2.20%</td>
<td>16.70%</td>
<td>41.10%</td>
<td>13.30%</td>
</tr>
<tr>
<td>27-30</td>
<td></td>
<td>3.80%</td>
<td>19.20%</td>
<td>7.70%</td>
<td>26.90%</td>
<td>42.30%</td>
<td>100.00%</td>
</tr>
<tr>
<td>&gt;31</td>
<td></td>
<td>10.60%</td>
<td>18.40%</td>
<td>15.90%</td>
<td>44.70%</td>
<td>10.50%</td>
<td>100.00%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>8.30%</td>
<td>19.90%</td>
<td>1.90%</td>
<td>20.40%</td>
<td>39.40%</td>
<td>10.20%</td>
</tr>
</tbody>
</table>
Note: Chi-square tests were conducted but the expected counts in the cells were not large enough to carry out a valid test.
CHAPTER FIVE
DISCUSSION

5.1 PEDAGOGICAL APPROACHES

The literature reveals that although critical thinking skills and interactive learning are emphasized, there is little consensus on the most effective methods for teaching or assessing medical ethics. In the cited literature many pedagogical approaches have been suggested for nurses and clinicians. There appears to be an agreement that an interactive, hands-on approach is best for teaching ethics. However, there is no one preferred epistemology. Studies have been done to compare different methods of teaching the same material and one study found that traditional methods (such as lecturing) are better for learning content while a more interactive group approach is better for stimulating critical thinking in students when teaching such topics as communication, confidentiality, ethics and interpersonal skills. Case studies and the use of real-life scenarios, such as the moral dilemmas used in the survey developed for this study, can be used in group activities where students discuss and formulate their own conclusions and teachers act as facilitators. In this way students learn, in a safe environment, how to deal with moral dilemmas. It has been suggested that formative rather than summative assessments may be better for teaching ethics and certainly group activities need not always be graded.

It is also suggested that in the workplace environment teacher/practitioners can teach simply by behaving ethically themselves and therefore by being a good example for their students. One of the studies (Satterwhite, Satterwhite & Enarson, 2000) showed that students were more likely to behave unethically when faced with mentors and peers that made derogatory comments concerning patients. It has also been shown that there is a theory-practice gap in nursing. This means that nurses “know” what is right but when faced with a moral dilemma may not do the right thing
when confronted with others that are acting unethically. More experiential learning in the clinical setting with real ethical dilemmas is needed to achieve heightened ethical awareness and behaviours.

Tools for evaluating physician/nursing performance include ITERs and OSCEs. The author has taken part in OSCEs as a volunteer “patient” many times and this method of examining nursing students appears to be a effective test of nursing skills for both theoretical and critical thinking. Scenarios are set up and a volunteer that has been briefed plays the role of the patient with a particular illness. The student must treat their “patient” as they would in a clinical situation. In May 2009 the author played the role of a support staff rather than a patient in the scenario. The student nurse is then responsible for the support staff in the application of his/her duties as the primary caregiver to the patient. It is possible that a similar approach may benefit in MLT training using scenarios pertaining to the laboratory or in communication with other health care workers.

Working technologists face ethical dilemmas on a daily basis. Scenarios provide the perfect forum for the teaching of ethics. Teachers can use real life ethical dilemmas, either from their own experiences, documented cases or fictional examples. That was the basis of the scenarios developed for this project and the example of moral reasoning concerning quality control issues in the following paragraph. These types of real-life situations can foster discussion that will be relevant to student technologists’ future ethical decisions.

Kohlberg argues that there should be some correlation between behaviour and reasoning and that moral action is more likely to occur the higher one scores on the scale. However, Crain (1985) contends that one's level of moral reasoning does not necessarily reflect moral behaviour. Therefore, does it really matter at which stage of moral development an employee or student is as long as they do the right
thing? It is reasonable to assume that one must know what the right thing to do is in the first place. For example, behaviour in regard to adherence to quality control protocols can reflect Kohlberg's stages of moral development. If one only does what someone else told them is the right thing, as in pre-conventional reasoning, it is conceivable that one could be easily led into doing something unethical by whomever they consider to be an authority figure. This can be seen in the following scenario. We are bid: “Forget the poor quality control results. We'll run them again later.” In this case the employee would do what they were told and patient care would be in jeopardy. Since it is inconceivable that a student or graduate would be incompetent enough not to know the quality control rules, we might then consider that their reasoning could be that of conventional morality, in which one would be more likely to do the right thing as prescribed by the laboratory procedures. For example: The quality control is all out of range. Usually the technologist would then troubleshoot the problem and rerun the controls. In this way the rules would be followed and meet the approval of one's peers. However, if they discover a problem with the troubleshooting procedure, would the technologist question their coworkers or supervisors if the technologist thought they would become angry with them? If not, this could delay correcting the problem and patient care could again be in jeopardy. If one reasons in a post-conventional mode, one might presume that the technologist would do the best thing for all clients, regardless of consequences. Assume, for example, that the troubleshooting procedure which would ultimately correct the quality control problem quicker was applied. The patient results would be delivered in a more timely manner, reducing the chance of poor patient outcome.

Consequently, anyone who scores low on the moral development scale may well do the wrong thing if they don't consider repercussions, as did the technologist in Scenario 1 of the survey. Conversely, if they score high on the scale, although the chances are considered to be greater, evidence that they will automatically do the right thing is not guaranteed. Colby and Kohlberg stated that the conventional level
of moral reasoning is the one most commonly found in the adolescent and adult population. The post-conventional level is characterized by the adoption of societal perspective and is found only in a minority of adults. Overall, student and graduate participants in this quantitative study chose higher stages of morality according to Kohlberg's Theory than respondents in earlier qualitative studies, such as the University of Sherbrooke study of student physicians.

5.2 RESEARCH QUESTIONS

1) Do Canadian Medical Laboratory Technology (MLT) students receive compulsory instruction in ethics?

Medical ethics are being taught to students going into the fields of health care including MLT. However, there does not appear to be any consistent training and there is no assessment of what medical ethics are actually being taught.

2) What types of ethics education do MLT students receive? That is, is their instruction delivered in general ethics courses, specific “biomedical ethics” courses or as ethics topics integrated into the core laboratory courses?

The teacher survey reveals that ethics are being taught throughout the MLT programs in Canada. However, it is also clear that, partially because the programs themselves are different, ranging from 2 year community college to 4 year university degrees, the number and type of ethics courses being taught are not the same. There are some similarities including that the teachers consider ethics education to be a high priority and they feel that the ethics training is adequate. In French schools more ethics courses are taught by philosophers and in English schools ethics courses are more often taught by health care providers. English schools offer case studies more often to demonstrate ethics issues and these are included in assignments.
3) What, if any, is the impact of ethics education in the practice of biomedical laboratory medicine?

Kohlberg contends that moral development does not take place due to maturation or socialization but as a product of reflection on moral issues. This is facilitated through interaction and open discussion about problems, resulting in construction of principles, an outcome being similar thinking on unrelated topics, for example, the 4 scenarios in the student survey.

The literature discloses that moral development does not take place during medical school. (Patenaude, Niyonsenga and Fafard, 2003, Akabayashi, Slingsby, Kai, Nishimura, and Yamagishi, 2004 and Slovackova and Slovacek, 2007) The survey results in this study concur with the literature that moral development does not take place during MLT training. It was demonstrated in the survey results that neither moral development nor moral decline occurs from the 1st year to the end of the program or in the 2 years post graduation. Kohlberg believed that there was hierarchic integration, meaning that people moved through stages from one to six and that regression between stages does not occur. As one moves from one stage to another they incorporate ideologies learned from the earlier stages. However, interestingly, this study did in fact show a slight (although not enough to be considered significant) regression in working technologists 2 years post graduation. These findings also agree with the findings from the University of Sherbrooke study which concluded that there was an absence of moral development after three years of medical school. (Patenaude, Niyonsenga and Fafard, 2003)

The researcher was curious to know whether or not gender played a role in moral development amongst technologist in MLT. Whether or not there is a gender difference is discussed in the literature. (Crain, 1985) Crosstabulations of the data
collected in this study reveal that there are minor differences but the One-way Anova shows that there is no statistical significance overall.

Also, in Canada, because the English/French distribution of MLTs in 2006 was roughly 75:25, comparisons were undertaken to see if there are differences between English and French respondents. For graduates the response rate for the mailed surveys overall was representative of the total number of surveys that were sent out. However, it is interesting to note that the response rate from the total number of French schools was 80% and from the total number of English schools was 47%. Overall 53% English and 47% French surveys were received. Crosstabulations show that distributions for English and French respondents are similar in all cases and One-way Anova shows that there is no statistical difference overall.

Traditionally, the students in MLT have a varied age range. The age spread was representative of the number of years of schooling, that is the 1st year group of students overall are younger than the graduates. Comparisons were undertaken to see if there is a difference amongst the age groups of respondents. Crosstabulations reveal that there are minor differences but One-way Anova shows no statistical significance overall.

It was, therefore, determined that in MLT ethics education the variables, including year of schooling, age, gender or mother tongue, have little or no impact in the practice of biomedical laboratory medicine.

5.3 LIMITATIONS AND RECOMMENDATIONS

Overall, the research project evolved nicely over time. The response rate was good at 37%. The researcher received satisfactory samples yielding beneficial data. All of the respondents were cooperative. The goal of the project was met. However, there are some limitations to the study which should be noted.
Firstly, the start date of the study was delayed by two months due to unforeseen circumstances regarding ethics board approval. The researcher believes that there could have been an improved response rate from the schools surveyed if the research project had been approved earlier in the semester. One school required that the project pass their ethics board as well and by the time it was approved the semester was over and it was too late to survey their students. Also, surveys received from post graduates did not all have teacher surveys available for evaluation since not all schools that the post graduates attended participated in the study.

Secondly, there were some problems in contacting teachers in MLT programs across Canada in a timely fashion. The researcher attempted to contact the schools directly by telephone to ask the Program Directors of the MLT Programs to support this research project. It was impossible to easily reach the contacts and since the project was delayed while waiting for approval from the Dawson College Ethics Board, the researcher emailed the chairpersons of all of the schools. Several replies were received inquiring about more details about the project and ultimately offering support for the project. Eventually, all except one of the respondent schools who made inquiries participated in the study and this was due solely to time limitations.

Thirdly, there was a minor problem in the administration of the pretest. The survey developed for this study was pretested with teachers and students. Instructions were not followed exactly by the teachers involved but overall only a few minor changes in wording were made in response to feedback obtained in the pretest. Students said that they liked the example of how to complete the scenarios section, so that was maintained.

Fourthly, there were some semantic problems. There were slight errors in the translation from English to French. However, it appears that this did not interfere with
or influence any answers to the survey questions. It is also noted that the questionnaires were initially set up for 1st year, 3rd year and 2 years post graduation respondents. Since the MLT programs across Canada are of varying lengths, “end of program” would have been the better option. This term was substituted for “3rd year” throughout this document.

Fifthly, the survey is totally quantitative, using closed-ended responses. In other studies using Kohlberg’s Stages of Moral Development, qualitative surveys were used. The use of a multiple choice survey makes the answers arbitrary. One respondent did not answer to all of the statements and noted that the answers were leading and assume that the participant shares those values. Although Kohlberg’s Stages of Morality were reflected in the responses, the researcher wonders if some of the results were unreliable. In the 1st and 2nd choices the level the MLT students and post graduates had an unusually high level of morality according to Kohlberg’s Stages. This may be explained by the choice of a quantitative study where all levels of morality are available to choose from versus a qualitative study where participants are asked for an explanation. Perhaps this study could be conducted with a group of participants answering open-ended questions and then following up by answering the same questions in the original format. In this way Kohlberg’s Stages could be determined from the qualitative format and compared to the quantitative format. For example, respondents might be asked open-ended questions in response to the scenarios as follows:

1) I would never falsify patient results because:
2) I would follow up immediately as per protocol because:
4) As a student I am honest and follow the rules because:
5) If I perform a phlebotomy poorly the consequences might be:

Finally, due to time constraints of completing the research project for Performa’s Masters in Education in a four-year period, this project was designed as a cross-
sectional study. Therefore the study does not measure if there are any changes in moral development in a particular group of students over a period of time. However, the data collected may be used in a longitudinal study in which the first year students would be tracked and resurveyed at the end of their program and two years post graduation. This information would be useful to the CSMLS who are working towards the implementation of upgraded CSMLS competencies, with an increased emphasis on ethics and professionalism. These will be incorporated into the 2010 examination.
CHAPTER SIX

CONCLUSION

There is no consensus in the literature as to whether or not medical ethics even needs to be taught to medical students. Patenaude, Niyonsenga & Fafard (2003) concluded that “the challenge will be to develop a curriculum that will enable medical students to at least maintain their stage of moral development if not increase it through the medical education experience.” (p. 843) Jang (2003) questions if it is even reasonable to expect medical programs to provide a conceptual ethics framework training as long as students learn to “do the right thing”.

Mattick & Bligh (2006) showed that medical schools graduate students who do not pass the ethics portion of their program still graduate. Most health care professionals find this unacceptable. It is imperative that students and graduates transfer moral maturation into ethical action. Surely, if we expect to graduate ethical health care practitioners, we must make ethics as important as any other topic of study in the core courses in MLT, such as Hematology or Biochemistry.

A review of relevant articles reveals that guidelines for successful programs in medical ethics are unmistakably deficient. However, most professionals agree that guidelines are needed for the teaching of ethics to all health care professionals, including MLT across Canada. The research findings in this study support the assertion that, at least as far as ethics is concerned, there is no national unity of MLT programs. One of the reasons for this is that teachers come from a variety of backgrounds ranging from health care workers, to philosophers, to “others”. As a result, there is no consistency in what teachers are teaching.

As demonstrated by the scenarios it is critical that technologists, as part of the multidisciplinary medical team, receive education in medical ethics. And, if possible, courses in medical ethics designed specifically for combined health care professionals
would be beneficial to clients. Mandatory medical ethics courses are reportedly being taught but mandatory general ethics courses are seldom taught. However, when students were asked if they received mandatory ethics courses less than half answered correctly. Therefore, students across Canada do not even know whether ethics courses are taught in their own curriculum or not. This, in itself, reveals a problem that should be addressed.

The main goal of this project which was to evaluate the increase or decline of moral development based on Kohlberg's model of moral development during training in Medical Laboratory Technology and amongst technicians working in the field two years post MLT training has been met. Although not significant overall, it is interesting that the scenario that deals with the ethical behaviour of students, the one which was mentioned in the introduction as a contributing factor for undertaking the study, is the only one in which results for choice 2 answers scores lower on Kohlberg's scale for all respondents, regardless of variables. As mentioned earlier, the literature suggests that moral judgment amongst medical students decreases with age and years of study. These findings were also observed in this study. There were slight variations in the students' perceptions on the different scenarios. For instance, as demonstrated in Figure 2, Scenario 2.3, pre-conventional moral development ranged from 11% in 1st year students to 4% at the end of program and increased to 16% for 2 year post graduates. This represents a reduction in moral reasoning from when they are students to when they are working in the field.

Concurring with previous studies, there was no statistical significance in any of the variables, including types of ethics courses taught, age range of respondents, program year, gender or mother tongue. The expected development of moral reasoning during MLT training was not demonstrated. Although there were no significant findings, the MLT survey results do show a similar trend to previous studies. There is a slight increase overall in students moral reasoning from 1st year to the end of
program, with a slight decline 2 years post graduate. The overall differences are not even close to the 0.5 stage change that is considered significant by Kohlberg. Ethics education, as it now stands, does not appear to have any impact on the practice of biomedical laboratory medicine, either positive or negative.

The CSMLS competency profile for students applies to all Canadian MLT programs. The need exists to create a cohesive national syllabus for ethics education. Multidisciplinary medical ethics courses must be set up to facilitate better understanding, communication, respect and ethical actions when dealing with other members of the medical community and their clients. CSMLS currently offers a distance continuing education course titled “An Introduction to Ethics and Professionalism for Medical Technologists”. Perhaps, either this course could be adapted for MLT students or another similar course could be offered in all MLT programs across Canada as part of their curriculum.
BIBLIOGRAPHICAL REFERENCES


Appendix 1
Survey for Students
Appendix 1

Ethics in Medical Laboratory Science Research Project
University of Sherbrooke
November 2007

Section 1: Background Information

Please answer the following questions by filling in the blanks or checking the □:

1. I attend, attended (check one only):
   - AB University of Alberta, Edmonton
   - AB Northern Alberta Institute of Technology, Edmonton
   - AB Southern Alberta Institute of Technology, Calgary
   - BC British Columbia Institute of Technology, Burnaby
   - MB Red River College, Winnipeg
   - NB NSCC/NBBC Contract Program, St. John
   - NB New Brunswick Community College, St. John
   - NB CCNB – Campbellton, Moncton
   - NF College of the North Atlantic, St. Johns
   - ON St. Clair College of Applied Arts and Technology, Windsor
   - ON University of Windsor/ St. Clair College of Applied Arts and Technology, Windsor
   - ON St. Lawrence College of Applied Arts and Technology, Kingston
   - ON The Michener Institute for Applied Health Sciences, Toronto
   - ON Cambrian College, Sudbury
   - QC CEGEP de Chicoutimi, Chicoutimi
   - QC CEGEP de Rimouski, Rimouski
   - QC CEGEP de Rosemont, Montreal
   - QC CEGEP de Sainte-Foy, Quebec
   - QC CEGEP de St-Jean-sur-Richelieu, St-Jean-sur-Richelieu
   - QC CEGEP de Saint-Jerome, Saint-Jerome
   - QC CEGEP de Sherbrooke, Sherbrooke
   - QC CEGEP de Saint-Hyacinthe, Saint-Hyacinthe
   - QC CEGEP de Shawinigan, Shawinigan
   - QC Dawson College, Montreal
   - SK Saskatchewan Institute for Applied Science and Technology, Saskatoon
   - Other: changed schools: Name of school(s): ___________________________
2. I am (a):
   - [ ] 1st year student
   - [ ] 3rd year student (end of program)
   - [ ] 2 years post graduate

3. I take (took) my courses in:
   - [ ] English
   - [ ] French

4. I am:
   - [ ] Male
   - [ ] Female

5. I am age:
   - [ ] 17-21
   - [ ] 22-26
   - [ ] 27-30
   - [ ] 31-40
   - [ ] >40

6. My MLT program offers mandatory general ethics courses.
   - [ ] Yes
   - [ ] No

7. My MLT program offers mandatory medical ethics courses.
   - [ ] Yes
   - [ ] No

8. My MLT program offers multi-disciplinary medical ethics courses to health care students.
   - [ ] Yes
   - [ ] No

9. Ethical issues are included in MLT courses.
   - [ ] Yes
   - [ ] No

10. Ethical issues are included in MLT course assignments.
    - [ ] Yes
    - [ ] No

Please go to the next page for the survey questions. You will be asked to read a scenario and then answer questions about the scenario. Before you begin, read the Scenario Example regarding Chocolate. Then proceed.
Scenario Example: Chocolate.

There are few foods that people feel as passionate about -- a passion that goes beyond a love for the "sweetness" of most candies or desserts: after all, few people crave caramel, whipped cream, or bubble gum. Chocolate is, well, different. For the true chocoholic, just thinking about chocolate can evoke a pleasurable response.

Instructions:

Choose, in order of importance, the 3 statements you believe are most true:

For example:

I like chocolate because:

1. it tastes good
2. it is sweet
3. I like the color
4. it gives me energy
5. I can buy it anywhere
6. there are many kinds to choose from

Please use the following scale. Indicate the statements that most closely reflect your views by placing their number in rank order:

Example:

_4_ 1st most important

_5_ 2nd most important

_1_ 3rd most important

Therefore, my view is that chocolate is a great "pick-me-up" (energy), I can buy it at anywhere and it tastes good. While the other statements are also true they are not as important to me.

The above scenario was just an example. Now, please go on to rank your answers in the following scenarios.
Scenario 1: Patient Recall
Translated from Radio-Canada news September 13, 2007

**Results of laboratory tests falsified: Medical files reopened**

The recall of patients at Ste-Anne-de-Beaupré Hospital raises concern. Four of the patients are deceased. So far no link can be made between their deaths and the falsification of diagnostic testing by a medical technologist.

Specialists will study these patient files as soon as next week, says Dr André Roy, director of professional and hospital services of Ste-Anne-de-Beaupré Hospital: «We must know if there is a link between the clinical history and these tests, falsified or not, because we have no proof that they were in fact falsified» he says. The Ste-Anne-de-Beaupré hospital has recently recalled 384 patients who were tested during the last six months. Twenty-two of these could not be reached.

The hospital found out that an employee falsified many blood and microbiology test results, indicating that they were normal when they were not. For the moment new assay results were made available for 180 patients. Certain health problems have been noted in 30% of the cases. Dr André Roy says that these patient results show a raise in red blood cells or antibodies, or a decrease in antibodies.

Results of 87 blood tests are pending.

The Quebec Provincial Police are investigating to determine if the ex-employee can be prosecuted for criminal offenses. The provincial order (OPTMQ) is also investigating.

I would never falsify patient results because:
1. my peers might be angry with me and will talk about me behind my back.
2. patient care would be compromised.
3. if I get caught I might be arrested.
4. I am committed to providing excellent patient care because it is the ethical thing to do.
5. I might get fired and I need my salary.
6. my employer expects me to do what is right.

**Indicate the statements that most closely reflect your views:**

___ 1st most important
___ 2nd most important
___ 3rd most important
Scenario 2: Communication

The technologist has a “panic value” result that she is phoning to the ward, as per laboratory protocol.

Ward Clerk: 4 Medical, Joan speaking
Technologist: Hi. This is Sharon from the Central Laboratory. May I speak to Dr. Smith?
Ward Clerk: I’m sorry. Dr. Smith is on ward rounds. Can I take a message?
Technologist: I have panic value results on Jane Doe, hospital #9999999.
Ward Clerk: Go ahead.
Technologist: PT 98.8
Ward Clerk: This is my first day here. Can you spell that?
Technologist: It’s the letters P and T; P as in Peter, T as in Toronto
Ward Clerk: Could you repeat that?
Technologist: PT 98.8
Ward Clerk: PT 98.8
Technologist: INR 10.25
Ward Clerk: Can you spell that?
Technologist: It’s the letters I N R
Ward Clerk: Could you repeat that result?
Technologist: INR 10.25. Is the head nurse available?
Ward Clerk: No, she’s at a meeting.
Technologist: Okay, so you’ll give these results to Dr. Smith right away?
Ward Clerk: Sure.

The technologist is sure that if even Dr. Smith does get the results in a timely manner, they will certainly not be correct.

I would follow up immediately as per laboratory protocol to make sure that Dr. Smith got the correct patient results because:

1. I wouldn’t want anyone to know I didn’t follow the protocols.
2. those are the rules and we have to follow them to keep order in the lab.
3. I want my friends in the lab to know that I am doing a good job.
4. it is important to make sure all patients receive the best possible care.
5. if Dr. Smith complains I could get in trouble if I didn’t follow the protocols
6. I have a moral obligation to provide appropriate care to every patient.

Indicate the statements that most closely reflect your views:

___ 1\(^{st}\) most important
___ 2\(^{nd}\) most important
___ 3\(^{rd}\) most important
Scenario 3: MLT Internship

Third year students were participating in the laboratory placement (stage/internship) portion of their medical laboratory program. Every day of the stage is mandatory. During their rotations they were all required to go to the college one day a week for classes. The hospitals were given a schedule outlining the days that the students would not be present at the hospital.

In this scenario, six students were involved, two from each of three hospitals. One of the classes at the school was cancelled after the stage teacher was given the students schedule. As there were changes occasionally, the college teacher just asked the students to pass on the information to the stage teacher. However, the students decided that since they were supposed to be at school and were not expected at the hospital, they would just take the day off.

Teachers discovered that the students had skipped their stage day and that it involved one whole group of students. The students were confronted and the consensus was that "we're only students... it's no big deal". It was pointed out that there is a "professionalism" portion in their course objectives and that a failure could mean a failure in their internship.

As a student I am honest and I follow the rules because:

1. students have a professional responsibility to themselves, their program and their future clients/patients.
2. I want everyone to see that I do the right thing.
3. for the MLT program to function well, we must all adhere to the rules.
4. I could fail my internship if I do not do what my teachers want me to do.
5. the terms regarding professionalism that are outlined in the course objectives are for the benefit of all students.
6. I want to pass the professionalism portion of my internship requirements.

Indicate the statements that most closely reflect your views:

___ 1st most important
___ 2nd most important
___ 3rd most important
Scenario 4: Preanalytical

Phlebotomy Today; October 2007
Tip of the Month: The Last Line of Defense

How many medical mistakes have you prevented because you follow the proper procedure every time without fail? You’ll never know... But when your goal is to prevent mistakes that can threaten the care of your patient, you always play by the rules...you’re a healthcare professional. As such, you refuse to underestimate how your technique can impact test results and the potential it has to change the way the physician manages the patient.

If I perform a phlebotomy poorly:

1. the patient might hit me. (yell at me)
2. I would not have filled my moral obligation to provide quality care to every patient
3. patient care could be compromised.
4. if my supervisor discovers that I hurt a patient I could be suspended.
5. my peers might think that I am incompetent or unprofessional.
6. my employer would think that I do not follow protocols in other cases.

Indicate the statements that most closely reflect your views:

___ 1st most important
___ 2nd most important
___ 3rd most important

The researcher greatly appreciates the time that you took to participate in this important study. Thank you.

Please return the completed survey to your teacher.
Recherche sur l’Éthique en Science de Laboratoire Médical
Université de Sherbrooke
Mars 2008

Questionnaire destiné aux étudiants du programme de Technologie de Laboratoire Médical.

Section 1: Informations statistiques
S’il-vous-plaît répondre aux questions en remplissant le ☐:

1. Je suis:
   ☐ étudiant de première année
   ☐ étudiant de troisième année
   ☐ bachelier depuis deux ans
   ☐ autre: Spécifier: _______________________________________

2. J’étudie à (un choix seulement):
   ☐ AB University of Alberta, Edmonton
   ☐ AB Northern Alberta Institute of Technology, Edmonton
   ☐ AB Southern Alberta Institute of Technology, Calgary
   ☐ BC British Columbia Institute of Technology, Burnaby
   ☐ MB Red River College, Winnipeg
   ☐ NB NSCC/NBBC Contract Program, St. John
   ☐ NB New Brunswick Community College, St. John
   ☐ NB CCNB – Campbellton, Moncton
   ☐ NF College of the North Atlantic, St. Johns
   ☐ ON St. Clair College of Applied Arts and Technology, Windsor
   ☐ ON University of Windsor/ St. Clair College of Applied Arts and Technology, Windsor
   ☐ ON St. Lawrence College of Applied Arts and Technology, Kingston
   ☐ ON The Michener Institute for Applied Health Sciences, Toronto
   ☐ ON Cambrian College, Sudbury
   ☐ QC CEGEP de Chicoutimi, Chicoutimi
   ☐ QC CEGEP de Rimouski, Rimouski
3. Je suis ou j’ai suivi des cours en:
☐ English  ☐ Français

4. Je suis:
☐ Homme  ☐ Femme

5. Mon âge:
☐ 17-21  ☐ 22-26  ☐ 27-30  ☐ 31-40  ☐ >40

6. Mon programme de Technique de Laboratoire Médical offre des cours d’éthique générale?
☐ Oui  ☐ Non

7. Mon programme de Technique de Laboratoire Médical offre des cours d’éthique médicale aux étudiants inscrits au programme seulement?
☐ Oui  ☐ Non

8. Mon programme de Technique de Laboratoire Médical offre des cours d’éthique générale multidisciplinaire aux étudiants de soins de santé?
☐ Oui  ☐ Non

9. Les questions d’éthique sont incorporées dans les cours de technique de laboratoire médical?
☐ Oui  ☐ Non

10. Les questions d’éthique sont incorporée dans les travaux pratiques du Programme de Technique de laboratoire médical?
☐ Oui  ☐ Non
**Scénario Exemple : Chocolat.**

http://www.exploratorium.edu/exploring/exploring chocolate/

Il y a peu d'aliments qui passionnent les gens autant que le chocolat- une passion qui dépasse l'amour du sucré de la plupart des bombons ou desserts: après tout, peu de gens adorent le caramel, la crème fouettée, ou la gomme balounne. Le chocolat est ... différent. Pour les vrais fanatiques, la simple pensée du chocolat susciter une réaction de plaisir.

**Instructions:**

Choisissez, par ordre d'importance, les 3 énoncés qui vous semblent les plus vrais:

Par exemple:

J'aime le chocolat parce que:

1. C'est bon au goût
2. C'est sucré
3. J'aime sa couleur
4. Ça me donne de l'énergie
5. Je peux en acheter n'importe où
6. Il en existe de multiples variétés

Utilisez l'échelle suivante. Indiquez les énoncés qui reflètent le plus votre point de vue en plaçant leur numéro dans l'ordre.

Exemple:

4. 1er plus important
5. 2ème plus important
1. 3ème plus important

Par conséquent, je suis d'opinion que le chocolat est merveilleux afin de donner de l'énergie, je peux en acheter partout et ça a bon goût. Les autres énoncés, quoique aussi vrais, sont moins importants pour moi.

Le scénario qui se retrouve ci-dessus n'était qu'un exemple. Maintenant, nous vous prions de répondre aux scénarios suivants.

**Avis:** Dans tout ce document, la forme masculine doit être interprétée comme incluant la forme féminine.
Scénario 1: Rappel de patients

Résultats d'analyses falsifiés Des dossiers médicaux rouverts
Source Radio-Canada nouvelles 13 Septembre 2007

Des inquiétudes surgissent à la suite du rappel de patients à l'hôpital Sainte-Anne-de-Beaupré. Quatre personnes qui faisaient l'objet du rappel sont décédées.

Pour l'instant, aucun lien ne peut être établi entre leur décès et la falsification de tests diagnostiques par une technologiste médicale.

Des spécialistes se pencheront sur ces dossiers dès la semaine prochaine, indique le Dr André Roy, directeur des services professionnels et hospitaliers de l'hôpital Sainte-Anne-de-Beaupré : « Il faut voir s'il y a un rapport entre l'analyse qu'ils avaient passée, falsifiée ou pas, parce qu'on n'a pas de preuve qu'elle était falsifiée, et l'histoire clinique », fait-il savoir.

L'Hôpital Sainte-Anne-de-Beaupré a procédé récemment au rappel de 384 patients qui ont subi des tests diagnostiques au cours des six derniers mois. Vingt-deux personnes n'ont pas pu être jointes.

L'établissement avait découvert qu'une employée aurait falsifié les résultats de nombreuses analyses sanguines et microbiologiques, en indiquant qu'ils étaient normaux, alors que ce n'était pas le cas.

Pour l'instant, les résultats de nouvelles analyses ont été obtenus pour 180 patients. Certains problèmes de santé ont été notés dans 30 % des cas. Le Dr André Roy indique que ces personnes présentent une augmentation du nombre de globules rouges ou d'anticorps, ou encore une diminution du nombre d'anticorps.

Les résultats de 87 autres analyses sont encore à venir.

La Sûreté du Québec mène une enquête pour déterminer si des accusations criminelles pourraient être déposées contre l'ex-employée. L'Ordre professionnel des technologistes médicaux du Québec a aussi ouvert une enquête.
Je ne falsifierais jamais les résultats de mes patients parce que:
1. Mes collègues pourraient être choqués contre moi et se mettre à parler de moi derrière mon dos.
2. Le soin des patients pourrait en être compromis.
3. Si je me fais prendre, je risque l'arrestation.
4. Je me suis engagé à dispenser d'excellents soins à mes patients parce que c'est la seule chose à faire qui respecte la déontologie.
5. Je pourrais être congédié et j'ai besoin de mon salaire.
6. Mon employeur s'attend à ce que je ne fasse que des choses qui sont bien.

Indiquez les énoncés qui reflètent le plus votre pensée:

___ 1er plus important

___ 2ème plus important

___ 3ème plus important
**Scénario 2: Communication**

Le technicienne a obtenu un résultat critique, auquel cas la procédure exige qu'elle téléphone au service requérant.

Interlocutrice: 4e Médical, Johanne à l'appareil.
Technicienne: Bonjour. C'est Sharon. Je suis technicienne au laboratoire central. Puis-je parler au Docteur Smith?

Interlocutrice: C'est impossible. Le Docteur Smith est en train de visiter ses patients dans l'unité. Puis-je prendre un message?
Technicienne: J'ai un résultat critique concernant Madame Jane Doe, numéro de dossier hospitalier 99999999

Interlocutrice: Allez-y.
Technicienne: PT 98.8

Interlocutrice: C'est ma première journée de travail ici. Pouvez-vous épeler?
Technicienne: C'est la lettre P comme Pierre et T comme Thérèse

Interlocutrice: Pouvez-vous répéter le résultat?
Technicienne: PT 98.8

Interlocutrice: PT 98.8
Technicienne: INR 10.25

Interlocutrice: Pouvez-vous épeler ça?
Technicienne: Ce sont les lettres I N R

Interlocutrice: Pouvez-vous répéter le résultat?
Technicienne: INR 10.25. Est-ce que l'infirmière-chef est disponible?

Interlocutrice: Non. Elle est en réunion.
Technicienne: OK. Alors vous allez transmettre ces résultats au Docteur Smith immédiatement?

Interlocutrice: Bien sûr.
Technicienne: Merci. Bye.

La technicienne est certaine que même si le Docteur Smith reçoit les résultats à temps, il est presque certain qu'ils seront incorrects.
Je ferais un rappel immédiat conformément à la procédure du labo afin de m'assurer que le Docteur Smith reçoive les bons résultats parce que:

1. Je ne voudrais pas que qui que ce soit sache que je ne respecte pas la procédure.

2. Ce sont les règlements et nous devons les suivre afin de garder le labo fonctionnel.

3. Je veux que mes amis dans le labo sachent que je fais du bon travail.

4. C'est important de m'assurer que les patients reçoivent les meilleurs soins possible.

5. Si le Docteur Smith se plaint je pourrais être dans le trouble si je n'ai pas respecté la procédure.

6. J'ai l'obligation morale de donner à tous les patients les soins les plus appropriés.

Indiquez les énoncés qui reflètent le mieux votre pensée:

___ 1<sup>er</sup> plus important

___ 2<sup>ème</sup> plus important

___ 3<sup>ème</sup> plus important
Scénario 3: Stage de technologie de laboratoire médical

Les étudiants de troisième année participaient à la phase de placement (stage) de leur programme de technologie de laboratoire médical. Tous les jours de stage sont obligatoires. Durant ces stages, tous les étudiants devaient se présenter en classe un jour par semaine. Les hôpitaux avaient reçu un horaire et cours spécifiant que les étudiants seraient absents de l'hôpital.

Dans ce scénario, six étudiants étaient impliqués, deux par hôpital. Un des cours de l'école avait été cancellé après que l'enseignant du stage avait reçu les horaires des étudiants. Comme il y avait des changements occasionnels, l'enseignant de l'école a simplement demandé aux étudiants de transmettre l'information aux enseignants des stages. Cependant les étudiants ont décidé que puisqu'ils étaient supposés être à l'école ils n'étaient pas requis d'être à l'hôpital, donc ils prenaient simplement une journée de congé. Les enseignants se sont aperçus que des étudiants ne s'étaient pas présentés à leur stage et que cela représentait un assez bon groupe d'étudiants.

Les étudiants ont été confrontés à la situation et la majorité a adopté la position qu'ils n'étaient que des étudiants et que ce n'était pas grave. On leur a fait remarquer qu'il y avait un aspect "professionalisme" dans leurs objectifs de cours et qu'un échec pouvait signifier l'échec de leur stage.

À titre d'étudiant je suis honnête et je suis les règlements parce que:

1. Les étudiants ont une responsabilité professionnelle envers eux-mêmes, envers leur programme et envers leurs futurs clients/patients.
2. Je veux que tout le monde sache que je m'acquitte de mes responsabilités.
3. Afin que le programme de technologie de laboratoire médical fonctionne bien, tous doivent accepter et respecter les règlements.
4. Je pourrais subir un échec à mon stage si je ne fais pas ce que mes enseignants me disent de faire.
5. Le professionnalisme qui fait partie des objectifs du cours doit s'appliquer à tous les étudiants.
6. Je veux réussir l'aspect professionnalisme de mon stage.

Indiquez les énoncés qui reflètent le plus votre pensée:

---

___ 1er plus important
___ 2ème plus important
___ 3ème plus important
Scénario 4: Pré-analyse

Phlebotomy Today; Octobre 2007

Le truc du mois: La dernière ligne de défense

Combien d’erreurs médicales avez vous évitées parce que vous respectez la bonne procédure à chaque occasion, sans anicroche? Vous ne le savez jamais.... Mais quand votre but est de prévenir les erreurs qui peuvent menacer la santé de vos patients, vous suivez toujours les règlements, ... vous êtes un professionnel de la santé. À titre de professionnel de la santé, vous refusez de sous-estimer comment votre technique peut avoir des conséquences sur les résultats des tests et potentiellement influer sur la gestion du dossier du patient par le médecin.

Si je fais une phlébotomie maladroitement:

1. Le patient pourrait me frapper ou m’injurier.
2. Je n’aurais pas rempli mon obligation morale de dispenser à tous les patients les meilleurs soins de santé possible.
3. Le soin des patients pourrait être compromis.
4. Si mon superviseur apprend que j’ai maltraité un patient je pourrais être suspendu.
5. Mes collègues pourraient penser que je suis incompétent ou que je manque de professionnalisme.
6. Mon employeur penserait que je ne respecte pas les procédures dans d’autres cas.

Indiquez les énoncés qui reflètent le mieux votre pensée:

___ 1er plus important
___ 2ème plus important
___ 3ème plus important

La recherchiste apprécie au plus haut point le temps que vous avez consacré afin de participer à cette recherche importante. Merci beaucoup

S’il-vous-plaît, retournez le questionnaire rempli à votre enseignant.
Appendix 2
Survey for Teachers
Appendix 2
Survey for Teachers
Ethics in Medical Laboratory Science Research Project
University of Sherbrooke
November 2007

Please answer the following questions by filling in the blanks or checking the ☐s that are applicable:

1. I teach at (name of school) ________________________________

2. Courses are taught in: English ______ French ______

3. I teach in a ☐ 1 year ☐ 2 year ☐ 3 year ☐ 4 year program ☐ Other (please give details) ________________

4. My program offers the following types of ethics curriculum:
   Check any boxes that are applicable.
   ☐ medical ethics courses (if yes, answer questions 5, 6 and 7)
   ☐ general ethics courses (if yes, answer questions 8 and 9)
   ☐ neither of the above (go to question 10)

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<thead>
<tr>
<th>Question</th>
<th>☐ 1</th>
<th>☐ 2</th>
<th>☐ 3</th>
<th>☐ 4</th>
<th>☐ 5</th>
<th>☐ 6</th>
<th>other</th>
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</thead>
<tbody>
<tr>
<td>5 My MLT program offers mandatory medical ethics courses in semester:</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
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<td>☐</td>
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<tr>
<td>6 My MLT program offers medical ethics courses to all health care students in semester:</td>
<td>☐</td>
<td>☐</td>
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<tr>
<td>7 Medical ethics courses are available to MLT students as complimentary courses in the following semesters</td>
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<tr>
<td>8 My MLT program offers mandatory general ethics courses in semester:</td>
<td>☐</td>
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<tr>
<td>9 General ethics Courses are available to MLT students as complimentary courses in the following semesters:</td>
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<td>☐</td>
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</table>
10. In planning the curriculum my program gives ethics courses a high priority:

☐ always  ☐ routinely  ☐ sometimes  ☐ seldom  ☐ never  ☐ Other ______

11. My program/institution offers adequate training in ethics:

☐ always  ☐ routinely  ☐ sometimes  ☐ seldom  ☐ never  ☐ Other ______

12. In my program/institution ethics courses are taught by:

☐ philosophers  ☐ medical ethicists  ☐ health care providers  ☐ don’t know  ☐ Other ______

13. Ethical issues are included in core MLT courses, for example, using relevant case studies:

☐ always  ☐ routinely  ☐ sometimes  ☐ seldom  ☐ never  ☐ Other ______

14. Ethical issues are included in core MLT course assignments:

☐ always  ☐ routinely  ☐ sometimes  ☐ seldom  ☐ never  ☐ Other ______

Please return the completed survey to the self-addressed stamped envelope provided and mail by April 30th, 2008.

The researcher greatly appreciates the time that you took to participate in this important study.
Recherche sur l’Éthique en Science de Laboratoire Médical
Université de Sherbrooke
Mars 2008

Questionnaire destiné aux enseignants du programme de technologie de laboratoire médical.

Nous vous prions de répondre en remplissant le □ applicable:

1. J’enseigne à (nom de l’institution) ________________________________.

2. Les cours se déroulent en: Français _______ English _______

3. J’enseigne dans le cadre d’un programme de 1 an 2 ans 3 ans 4 ans

4. Ce programme offre les cours d’éthique suivants:
   □ cours d’éthique médicale (si réponse positive, passez aux questions 5, 7 et 9)
   □ cours d’éthique générale (si réponse positive, passez aux questions 6 et 8)
   □ aucun des deux choix ci-dessus (allez à la question 10)

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<th>4</th>
<th>5</th>
<th>6</th>
<th>autre</th>
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<tbody>
<tr>
<td>5 Mon programme de Technologie de Laboratoire Médical offre des cours d’éthique médicales obligatoires lors d’une session: (identifiez la session)</td>
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<tr>
<td>6 Mon programme offre des cours d’éthique générale lors d’une session: (identifiez la session)</td>
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</tr>
<tr>
<td>7 Mon programme offre des cours d’éthique médicales à tous les étudiants des programmes de soins de santé lors d’une session: (identifiez la session)</td>
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<tr>
<td>8 Est-ce que des cours d’éthique générale sont disponibles pour les étudiants de technologie de laboratoire médical à titre de cours complémentaires : (identifiez la session)</td>
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<tr>
<td>9 Est-ce que des cours d’éthique médicale sont disponibles aux étudiants de technologie de laboratoire médical à titre de cours complémentaire : (identifiez la session)</td>
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</table>
10. Mon programme/mon institution considère que l'enseignement de l'éthique est un grande priorité:

☐ toujours  ☐ la plupart du temps  ☐ à l'occasion  ☐ rarement  ☐ jamais

☐ autre  (Précisez)  

____________________________________________
Appendix 3
Informed Consent for Students
Appendix 3
Informed Consent Form for Students

Project Title: The Impact of Ethics Education in Medical Laboratory Science

I agree to take part in the above Dawson College/CSMLS research project. I have had the project explained to me, and I have read the Explanatory Statement, which I may keep for my records. I understand that agreeing to take part means that I am willing to complete a questionnaire designed to evaluate the level of moral (ethical) development of students during MLT training. Participants are students that have completed first year or third year or are technologists 2 year post graduate.

Data Protection:

This information will be used to determine if ethical standards increase, decrease or remain the same during MLT training.

This study will include all students and graduates that are willing to participate. I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published.

I agree to Sharon Leal recording and processing this information about me. I understand that this information will be used only for the purposes set out in this document. You may withdraw your participation in this study at any time.

Participants 18 years or older, please sign below:
Name: ____________________________________________ (please print)
Signature: __________________________________________
Date: ____________________________________________

If participant is under age 18, a parent or guardian must sign the consent form below:
Student's Name: ______________________________________ (please print)
Parent’s Name: ______________________________________ (please print)
Signature: __________________________________________
Date: ____________________________________________
Consentement éclairé à l'intention des étudiants
Nom du projet: L'impact de l'enseignement de l'éthique dans le cadre de la Technologie de Laboratoire Médical

Je consens à participer au projet de recherche dans le cadre d'une thèse de maîtrise en éducation l'Université de Sherbrooke commandité par la Société Canadienne des Sciences de Laboratoire Médical (S.C.S.L.M.)

Je reconnais que le projet m'a été expliqué et j'ai lu les avis d'explication lesquels je suis autorisé à conserver pour mes archives. Je comprends que mon consentement à participer implique que je consens à compléter un questionnaire qui servira à décrire quel enseignement moral ou éthique est dispensé dans l'institution où je suis les cours de Technologie de Laboratoire Médical. Les participants sont des étudiants de première année, ou des étudiants de troisième année, ou des techniciens qui ont deux ans d’expérience.

Protection de l'information:
Cette information sera utilisée afin de tenter de déterminer si les standards d'éthique augmentent, diminuent ou restent stables durant la formation de Technologie de Laboratoire Médical.

Cette étude vise tous les étudiants et les gradués qui consentent à participer. Je comprends que toute information que je fournirai restera confidentielle et qu'aucune information qui pourrait mener à toute identification de quelqu'un que ce soit ne sera publiée dans quelque rapport de ce projet, ou à n'importe qui d'autre. Il n'y aura aucune information personnelle de publiée.

Je consens à ce que Sharon Leal enregistre et étudie cette information qui me concerne. Je comprends que cette information sera utilisée uniquement dans les buts de cette recherche tels que décrits dans ce document. Je pourrai retirer ma participation à cette étude à tout moment.

De plus, je consens à participer dans une étude longitudinale ce qui implique que je devrai donner mon nom à la Société Canadienne des Sciences de Laboratoire Médical (S.C.S.L.M.) quand j'aurai deux ans d'expérience, en 2012, uniquement afin de recevoir par la poste un questionnaire de suivi. [ ] Oui [ ] Non

Participants âgés de 18 ou plus, s'il vous plaît signer ici-bas
Nom: __________________________________________ (caractère d'imprimerie)
Signature: __________________________________________
Date: ______________________________________________

Si le participant est âgé de moins de 18 ans, un parent ou gardien doit signer le formulaire de consentement ici-bas:
Nom de l'étudiant: __________________________________________ (caractère d'imprimerie)
Nom du parent ou gardien: __________________________________________ (caractère d'imprimerie)
Signature du parent ou gardien: __________________________________________
Date: ______________________________________________
APPENDIX 4
Letter from Kurt Davis
Dear Member,

Enclosed with this letter you will find a survey authored by CSMLS member Sharon Leaf. This survey is part of her project entitled The Impact of Ethics Education in Medical Laboratory Science.

The CSMLS Board of Directors believes that this research will be a valuable contribution to the body of knowledge about our profession in Canada, and has approved CSMLS assistance to Sharon in the distribution of this survey tool. We would encourage you to complete the enclosed document and return it by the prescribed deadline.

If you have any questions about the survey tool we would encourage you to contact Sharon directly. If you have any questions about the CSMLS approval of this cooperation please contact me directly at 1-800-263-8277 ext 11 or by email at kurtd@csmls.org.

Sincerely,

Kurt H. Davis
FCSMLS CAE
Executive Director
APPENDIX 5
Introductory Letter to Schools
Hello,

My name is Sharon Leal and I have been a member of CSMLS for 35 years. I work at the Royal Victoria Hospital in Montreal and am a student in the Master Teacher Program at the University of Sherbrooke. As the Central Laboratory Quality Control and Health & Safety Officer in my institution I have a great interest in laboratory ethics. I am the author and instructor of the CSMLS Continuing Education course *An Introduction to Ethics and Professionalism for Medical Technologists*.

I am undertaking a Canada-wide research project titled *The Impact of Ethics Education in Medical Laboratory Science* as the final requirement for my masters' degree. The literature that I reviewed suggests the moral development of student physicians does not increase but rather decreases with age and the longer they are in medical school. Because the role of technologists as part of the health care team differs greatly from that of physicians, it follows that the results of this research does not apply to medical technologists or other health care professionals.

My research project focuses on the stages of moral development of student and working technologists 2 years post graduation. I have the ongoing support of the CSMLS (see attached letter from Kurt Davis, Executive Director of CSMLS) who will publish my final report in the CJMLS journal and assist me in making this a longitudinal study which involves surveying the 1st year students again in 3rd year (2 010) and 2 years post graduation (2012). Incidentally, this project corresponds with the new CSMLS competencies which are in effect for the 2010 graduates.

With your permission, I will be sending 2 surveys to you by mail before the end of March. The first is for one teacher or program administrator to fill out regarding the ethics education that students receive at your school. The second is a survey for students, which will measure the level of student/graduate moral development according to Kohlberg's Theory. I anticipate that the results of this project will be available by the end of 2008.

Please reply to this email if you have questions about this research or if you do not consent to participating in the study.

Thank you for your support for my project,
Sharon Leal
Bonjour,

Mon nom est Sharon Leal et je suis membre de la Société Canadienne des Sciences de Laboratoire Médical depuis plus de 35 ans. Je suis à l’emploi du Centre Hospitalier Royal-Victoria de Montréal. Je suis en train de compléter un programme de maîtrise en éducation à l’Université de Sherbrooke.

Mon travail à titre de Responsable du Contrôle de la Qualité du laboratoire central du Centre Hospitalier de l’Université McGill et de Responsable de la Santé et de la Sécurité dans mon lieu de travail m’amènent à considérer avec un grand intérêt la question de l’éthique dans les laboratoires médicaux. J’ai rédigé et j’enseigne un cours d’Éthique et de conduite déontologique pour les techniciens de laboratoires dans le cadre de l’éducation permanente de la Société Canadienne des Sciences de Laboratoire Médical.

Je débute un projet de recherche pan-canadien intitulé L’Impact de l’Enseignement de l’Éthique en Science de Laboratoire Médical. Ce projet de recherche est fait dans le cadre de la rédaction de ma thèse de maîtrise. Mes recherches en doctrine semblent indiquer que le développement moral des étudiants en médecine diminue au lieu d’augmenter avec le temps et ceci même pendant leurs années d’étude. Cependant il y a des raisons de croire que ces études dans le champ de la médecine peuvent ne pas s’appliquer aux techniciens médicaux ou aux autres professionnels de la santé à cause du rôle différent que remplissent ces professionnels dans le cadre plus général du système de santé publique.

Mon projet de recherche s’attardera sur le développement moral des étudiants et des techniciens médicaux qui sont gradués depuis moins de trois ans. J’ai l’appui de la Société Canadienne des Sciences de Laboratoire Médical (voir la lettre de M. Kurt Davis, Directeur général de la SCSTM) et mon rapport final sera publié dans le journal de la SCSTM, laquelle me permettra aussi de prolonger cette étude qui implique les étudiants de première année de la promotion commençant en 2008 afin de voir leur cheminement en troisième année, en 2010, ainsi que deux ans après leur graduation, soit en 2012. Incidemment, ce projet coïncide avec les nouvelles compétences requises de la SCSTM qui seront en vigueur pour les finissants de 2010.

Avec votre permission, je vous enverrai deux questionnaires par la poste avant la fin de Mars 2008. Le premier questionnaire est destiné aux enseignants ou aux administrateurs de programmes et concerne la description détaillée des cours dispensés aux étudiants de votre institution. Le second questionnaire est destiné aux étudiants et il servira à tenter de mesurer le niveau de développement moral tant au niveau des étudiants que des bacheliers à la lumière de la théorie de Kohlberg. Je prévois que les résultats de cette étude seront disponibles vers la fin de 2008.

Je vous prie de répondre à ce courriel si vous avez quelque question au sujet de cette recherche ou si vous ne désirez pas participer à cette étude.

Je vous remercie à l’avance de votre coopération à ma thèse de maîtrise.

Sharon Leal
Appendix 6
Informed Consent for Teachers
Appendix 6

Informed Consent Form for Teachers

Project Title: the Impact of Ethics Education in Medical Laboratory Science

I agree to take part in the above Dawson College/CSMLS research project. I have had the project explained to me, and I have read the Explanatory Statement, which I may keep for my records. I understand that agreeing to take part means that I am willing to complete a questionnaire designed to evaluate the level of educational opportunities that contribute to students’ moral (ethical) development during MLT training.

Data Protection:

This information will be held and processed for the following purposes:

- to ascertain the different moral (ethical) development educational opportunities that students experience during MLT training throughout the country
- to compare the changes in moral (ethical) development educational opportunities that students experience during MLT training should the study continue to be longitudinal for the first year students

I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published.

I agree to Sharon Leal recording and processing this information about the MLT program. I understand that this information will be used only for the purposes set out in this document. You may withdraw your participation in this study at any time.

Please sign below:
College: ________________________________ (please print)
Name: _________________________________ (please print)
Signature: ______________________________
Date: ________________________________
Formulaire de consentement éclairé à l'intention des professeurs

Titre du projet : L'Impact de l'enseignement de l'éthique dans les laboratoires médicaux

Je consens à participer au projet de recherche dans le cadre d'une thèse de maîtrise en éducation l'Université de Sherbrooke commandité par la Société Canadienne des Sciences de Laboratoire Médical (S.C.S.L.M.)

Je reconnais que le projet m'a été expliqué et j'ai lu les avis d'explication lesquels je suis autorisé à conserver pour mes archives. Je comprends que mon consentement à participer implique que je consens à compléter un questionnaire qui servira à décrire quel l'enseignement moral ou éthique est dispensé dans l'institution qui retient mes services d'enseignement de Technologie de Laboratoire Médical.

Protection de l'information :

Toute information sera retenue et traitée aux seules fins suivantes :

Identifier l'enseignement moral ou éthique dispensé aux étudiants des Programmes de Technologie de Laboratoire Médical à travers le pays

Comparer les différences dans l'enseignement moral ou éthique dispensé aux étudiants des Programmes de Technologie de Laboratoire Médical dans l'éventualité où l'étude suivrait les étudiants de première année pendant une certaine période.

Je comprends que toute l'information que je mets à la disposition de l'étude sera confidentielle et qu'aucune information qui pourrait servir à identifier quelqu'un individu ne sera divulguée dans quelque rapport que ce soit ni à quelque autre partie pour aucune autre fin. Aucune information personnelle ne sera publiée.

Je consens à ce que Madame Sharon Leal enregistre et traite l'information concernant le Programme de Technologie de Laboratoire Médical. Je comprends que cette information sera utilisée seulement pour les fins spécifiques contenues dans ce document. Je peux reprendre ma participation à cette étude à tout moment.

Institution : ____________________________ (en caractères d'imprimerie)
Nom : ____________________________ ( en caractère d'imprimerie)
Signature : ____________________________
Appendix 7
CSMLS Accredited Programs, 2008
Appendix 7

CSMLS Accredited Programs, 2008

AB University of Alberta, Edmonton
AB Northern Alberta Institute of Technology, Edmonton
AB Southern Alberta Institute of Technology, Calgary
BC British Columbia Institute of Technology, Burnaby
MB Red River College, Winnipeg
NB NSCC/NBBC Contract Program, St. John
NB New Brunswick Community College, St. John
NB CCNB – Campbellton, Moncton
NF College of the North Atlantic, St. Johns
ON St. Clair College of Applied Arts and Technology, Windsor
ON University of Windsor/ St. Clair College of Applied Arts and Technology, Windsor
ON St. Lawrence College of Applied Arts and Technology, Kingston
ON The Michener Institute for Applied Health Sciences, Toronto
ON Cambrian College, Sudbury
QC CEGEP de Chicoutimi, Chicoutimi
QC CEGEP de Rimouski, Rimouski
QC CEGEP de Rosemont, Montreal
QC CEGEP de Sainte-Foy, Quebec
QC CEGEP de St-Jean-sur-Richelieu, St-Jean-sur-Richelieu
QC CEGEP de Saint-Jerome, Saint-Jerome
QC CEGEP de Sherbrooke, Sherbrooke
QC CEGEP de Saint-Hyacinthe, Saint-Hyacinthe
QC CEGEP de Shawinigan, Shawinigan
QC Dawson College, Montreal
SK Saskatchewan Institute for Applied Science and Technology, Saskatoon
APPENDIX 8
CSMLS Competencies for the 2010 Exams
Appendix 8

COMPETENCY PROFILE

General Medical Laboratory Technologist

Competencies Expected of an Entry-Level General Medical Laboratory Technologist

MAY 2005

Effective with the June 2010 Examination

CODE OF PROFESSIONAL CONDUCT

- Medical laboratory professionals are dedicated to serving the healthcare needs of the public. The welfare of the patient and respect for the dignity of the individuals shall be paramount at all times.
- Medical laboratory professionals work with other health care professionals, to provide effective patient care.
- Medical laboratory professionals shall promote the image and status of their profession by maintaining high standards in their professional practice and through active support of their professional bodies.
- Medical laboratory professionals shall protect the confidentiality of all patient information.
- Medical laboratory professionals shall take responsibility for their professional acts.
- Medical laboratory professionals shall practise within the scope of their professional competence.
- Medical laboratory professionals shall endeavour to maintain and improve their skills and knowledge and keep current with scientific advances. They will uphold academic integrity in all matters of professional certification and continuing education.
- Medical laboratory professionals shall share their knowledge with colleagues and promote learning.
- Medical laboratory professionals shall be aware of the laws and regulations governing medical laboratory technology and shall apply them in the practise of their profession.
Medical laboratory professionals shall practise safe work procedures at all times to ensure the safety of patients and co-workers and the protection of the environment.

March 2007 © CSMLS

FOREWORD

In the past, the most marketable skill of an entry-level medical laboratory technologist was considered to be the application of principles learned in the educational program, which were then used in a broad spectrum of laboratory testing in the work environment. The competencies proposed here for the entry-level medical laboratory technologist build on these application skills: they create a vision of a laboratory professional who can not only apply learned principles, but also communicate, evaluate and extend these principles through research, critical thinking and continuous learning in their interactions with patients, clients, and other health care professionals.

This competency profile for entry-level medical laboratory technologists continues the CSMLS focus on outcomes rather than on content to meet the needs of our changing profession. Most of the competencies outlined here formed the original entry-level profile, last revised in November 2000. They resulted from extensive analysis, clarification and validation procedures to ensure that they represented entry-level activities. The profile was accompanied by a commitment to continue the validation process by seeking and implementing input from practitioners, managers, educators, employers, members of the Canadian Association of Medical Laboratory Educators (CAMLE), and CSMLS exam panel members. The original profile has been modified, mainly through the addition of relevant competencies, to reflect the additional knowledge, skills and attitudes necessary for an entry-level medical laboratory technologist to perform successfully in the laboratory and to thrive in the health care system. This new profile will continue to benefit from the ongoing evaluation process already established for previous competency profiles.

In using the profile please note that the term “common” is used in reference to blood group antigens, microorganisms, etc., and should be interpreted as those which occur frequently in the population and are encountered on a regular basis in clinical practice. The
competencies should be interpreted in their broadest sense and not limited by the concept of five laboratory disciplines.

For the purposes of this draft document, text that has been added to the original profile is highlighted, as are notes about omissions of text. With the exception of the paragraph above and a few phrases here and there, this Foreword has been completely revised.

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ASSUMPTIONS ABOUT MEDICAL LABORATORY SCIENCE

The Medical Laboratory Technologist
Upon completion of an accredited program, has developed a broad knowledge base that is assessed prior to the certification examination.
Practises to ensure the safety of patients, colleagues, self, and the environment.
Contributes to the health care of the public, educates the public, promotes the welfare of the patient, respects the patient's dignity, and protects patient confidentiality.
Is an integral member of the health care team who shares knowledge that is essential to the diagnosis and treatment of disease, promotes learning, and collaborates with other professionals in providing effective patient care.
Is responsible and accountable for professional acts and practices according to standards of practice as well as laws and regulations governing the profession.

The Client/Patient
The client is any individual who interacts with the medical laboratory technologist (e.g., patient, patient representative, other health care professionals, other laboratory professionals).
The patient is any individual requiring medical laboratory services.
The medical laboratory technologist works with clients to procure and analyze specimens and evaluate these analyses.
The medical laboratory technologist maintains effective verbal and written communication skills to optimize interaction with clients in the provision of a high quality professional service.

**The Environment**

The medical laboratory technologist is prepared to work in a variety of settings including, but not limited to, hospitals, private medical laboratories, community health departments, educational institutions, the home and bedside of the patient, and private industry.

The medical laboratory technologist works in an environment that is dynamic and evolving, and uses technological equipment to provide accurate information in a timely manner.

**COMPETENCY CATEGORIES**

1. **Safe Work Practices** Conducts professional practice according to established protocols, safety guidelines, and existing legislation.

2. **Data Collection and Specimen Procurement/Receipt** Verifies relevant data and ensures that appropriate specimens are procured according to established protocols.

3. **Analysis of Specimens and Validation of Results** Analyzes specimens and validates results using established protocols.

4. **Analytical Techniques** Understands the principles and performs analytical techniques on specimens that originate from a variety of sources.

5. **Interpretation and Reporting of Results** Using scientific knowledge as the basis, interprets, communicates, and documents confidential data.

6. **Quality Management** Practises and promotes the principles of quality management and the efficient utilization of resources.

7. **Critical Thinking** Applies critical thinking skills to constructively solve problems.

8. **Applied Investigation** Demonstrates research skills to investigate, evaluate or problem solve.

9. **Resource Management** Addresses workplace challenges by applying skills involving human resources, as well as skills in change management, materials management, financial management and information management.
10. Communication and Interaction Interacts with clients/patients in a professional and competent manner, using effective listening, verbal and written communication in dealings with laboratory colleagues, patients, clients and other health professionals. The medical laboratory professional projects a professional image and follows generally accepted practices regarding interactions with clients, patients and colleagues.

11. Professionalism Meets the legal and ethical requirements of practice and protects the patient’s right to a reasonable standard of care. Professional responsibility encompasses scope of practice, accountability, and professional development.

**Category 11**

**Professionalism**

*The medical laboratory technologist meets the legal and ethical requirements of practice and protects the patient’s right to a reasonable standard of care. Professional responsibility encompasses scope of practice, accountability, and professional development.*

**COMPETENCY**

11.01 Provides for the health care needs of the public, keeping the welfare and confidentiality of the patient paramount at all times, and respecting the dignity, values, privacy and beliefs of the individual

11.02 Complies with legislation governing medical laboratory technology and applies these to the practice of the profession

11.03 Seeks help and guidance when asked to perform beyond competence

11.04 Discusses procedure in order to facilitate informed consent and respects a patient’s right to refuse treatment

11.05 Exercises a judicious approach to the right to refuse to participate in potentially dangerous situations

11.06 Takes responsibility and is accountable for professional actions

11.07 Identifies learning needs and participates in continuing education and training

11.08 Keeps abreast of laboratory techniques and research and shares new knowledge with colleagues
11.09 Promotes the image and status of the profession of medical laboratory science as members of the health care team by maintaining high standards in practice
11.10 Promotes an awareness and understanding of the contribution the medical laboratory technologist provides to the consumer and public
11.11 Recognizes how ethical issues in the health care environment affect the medical laboratory technologist

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APPENDIX 9
Semesters in which Ethics are Taught
Appendix 9

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APPENDIX 10

Oneway ANOVA
### Appendix 10

**Oneway Anova**

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