COMP CCPM
CANADIAN ORGANIZATION OF MEDICAL PHYSICISTS
ORGANISATION CANADIENNE DES PHYSICIENS MEDICAUX

CANADIAN COLLEGE OF PHYSICISTS IN MEDICINE
LE COLLEGE CANADIEN DES PHYSICIENS EN MEDECINE

CANADIAN MEDICAL PHYSICS
NEWSLETTER / Le BULLETIN
CANADIEN de PHYSIQUE MEDICALE

March / Mars 1992

From the editor:

It is obvious from this mailing that some of the members of COMP and CCPM have been busy the last few months. Again these folks have made my work easier and I thank them for this.

Walter Huda and Trevor Cradduck have submitted reviews of books and conferences. Trevor also comments on the IPSM policy statement which was included in the last issue of the newsletter. Raymond Carrier reports on the current membership of COMP and has also listed E-mail addresses of the members. Doug Cormack and Paul Johns preview upcoming conferences while Jake van Dyk and Ellen El-Khatib summarize some of the issues currently facing medical physicists. These articles alone make the Newsletter a valuable bulletin.

In this issue we also present the results of the recent salary survey. I congratulate Ron Sloboda and Sherry Connors on their quick work in compiling these data in such a clear fashion.

The Newsletter mailing this month contains some additional material. To show appreciation for the backing of our corporate members, we are allowing them to use the mailing to inform us of of their support and of some of their new products. The mailing also includes the new brochure entitled 'Medical Physics in Canada'. This brochure was compiled by John Andrew in Halifax and I think we should all applaud John for his excellent work. This brochure is a fantastic introduction into what we are all about. Get on the phone or write him now to show your appreciation (don't be the last). I think the brochure will increase our profile in both the physics and hospital milieus. John gives us some instructions for ordering the brochure on page 22 of the Newsletter.

I am slowly getting into the rhythm of being Newsletter editor. (The rhythm isn't quite there yet so this issue is again about two weeks late. I trust I haven't kept you on the edges of your seat too long.) I ask that you the reader continue to help me put out a useful product. It would be good to hear some new voices report on their activities. Try to submit work using E-mail or on computer disk as this makes my work easier (see instructions on page 19).

There are two main concerns for the next issue. First please encourage past students to submit abstracts of their graduate work (SEE page 21). Also, I need some new volunteers to help translate some of the articles into or from French. This issue will not have a translation of my editorial since my I did not want to impose any more on the good graces of my regular translators.

Again I thank all those who submitted material for this issue. I also thank Jean Pierre Bissonnette, Horatio Patrocinio, Heather Schreiner, and Lysanne Normandeau for proof reading and the French translations. I also thank Horatio and Michael Evans for helping collate the material for this mailing.

John Schreiner

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BRITISH INSTITUTE OF RADIOLOGY (BIR) REPORT 20

Optimization of Image Quality and Patient Exposure in Diagnostic Radiology

BM Moores, BF Wall, H Eriskat, & H Schibilla (ed.)

[Published by Butterworths Scientific Ltd, PO Box 63, Westbury House, Bury Street, Guilford, Surrey GU2 5BH, UK]

BIR Report 20 contains presentations at a workshop entitled "Optimization of Image Quality and Patient Exposure in Diagnostic Radiology" which was held in Oxford (UK) in September 1988. The workshop was organized by the Commission of the European Communities (Radiation Protection Directorates for Science, Research & Development + Environment, Nuclear Safety and Civil Protection) and the National Radiological Protection Board (NRPB) in the UK. The workshop focussed on attempts to standardize, from both a scientific and a practical perspective, quality criteria for the "Euro x-ray". As to be expected, of the 77 papers presented, only two were from North America with the remainder from numerous European countries.

The topics covered in this report include image perception, physical and clinical aspects of image quality, and attempts to "optimize" image quality in diagnostic radiology. Also included in the Appendix is a working document attempting to define "Quality Criteria for Diagnostic Radiographic Images". This includes a list of diagnostic requirements (+ examples of good techniques) for chest, skull, lumbar spine, urinary tract, pelvis and breast x-ray examinations. Of particular interest are guidelines on patient exposure (entrance surface dose) for each type of examination which are intimately coupled to the diagnostic imaging performance. For example, for a PA chest x-ray on a standard sized patient, the measured surface dose should be less than 30 mrad (0.3 mGy). The resultant images, however, should permit circular high contrast objects ($\geq$ 0.7 mm) and low contrast objects ($\geq$ 2 mm) to be visualized in the whole lung and retrocardiac areas. Linear and reticular details out to the lung periphery (high contrast $\geq$ 0.3 mm in width and low contrast $\geq$ 2 mm in width) should also be visualized.

BIR report 20 reflects an important trend whereby medical imaging scientists are beginning to move beyond current approaches in the application of "imaging science" to the clinical practice of diagnostic radiology. Traditionally, medical physicists have focussed on the assessment of patient radiation doses and the measurement of x-ray imaging equipment Quality Control (QC) parameters such as kVp, focal spot sizes, & half value layers. However, it is clearly important to attempt to include (some) consideration of image quality when evaluating the acceptability of a measured "patient radiation dose". Furthermore, it would be most helpful to be able to relate measurable QC parameters to resultant clinical diagnostic performance. From this perspective, BIR report 20 is a most welcome addition and should be required reading for North American medical physicists interested in image quality issues. Although the published papers are generally limited to 1 to 2 pages in length, they do provide a useful summary of current work presently taking place in Europe in the field of optimization of image quality in most areas of diagnostic radiology.

Walter Huda
University of Florida
December 1991

REPORT ON AECB SYMPOSIUM ON LEUKAEMIA CLUSTERING

Held in Ottawa, March 11, 1992

This meeting was organized by the Atomic Energy Control Board Advisory Committee on Radiological Protection in conjunction with AECL Research, Health and Welfare Canada and the Atomic Energy Control Board. It was intended as a review of the mechanisms for detecting and analyzing clusters of childhood leukaemias such as those that have been reported in the Sellafield area of the U.K. and to answer the concerns of communities who are located close to nuclear facilities.

The symposium was opened by Dr. Rene Levesque, President of the Atomic Energy Control Board who outlined some of the background and in particular, the Yorkshire TV program and Gardner's subsequent paper that brought the cluster at Sellafield to the public attention.

Dr. Osborne from AECL research, outlined the objectives of the meeting and suggested that a number of challenges were being issued to the speakers to try to provide answers to the important questions of whether clusters were a statistical phenomenon or were a result of real biological hazard. I am not sure that either of these objectives was met although the many eminent speakers on the program certainly presented some most interesting and valuable information.

The first major speaker was Dr. Peter Boyle who is the Director of the Division of Epidemiology and Biostatistics in the European Institute of Oncology in Milan. The first question posed was "What constitutes a cluster?". Dr. Boyle's definition was that of two or more cases occurring in association with time, space or some other common factor such as occupation. It should be noted that all diseases cluster and that the phenomenon is by no means confined to childhood leukaemia. One problem is that once a cluster has been observed, the Texas sharp shooter syndrome comes into play. This is where the target is moved to provide accuracy AFTER the shots have been fired.

Dr. Boyle reported on the numerous statistical methods that are used to analyze health records with the objective of detecting clusters. Two basic methods are applied - in one a grid is applied which is usually based on electoral or census districts and the other relies upon time and space associations. I cannot detail the various methods that have been proposed but, having described these statistical methods, Dr. Boyle went on to describe a project in which he and the originators of the various techniques used real data derived from the incidence of childhood leukaemia in the County of Yorkshire in England in order to test the various cluster detection methods. The real data were massaged in order to create statistical clusters involving various percentages of the total number of cases and varying numbers of parent locations within the county. The method for generating the test data was agreed upon by all of the participants in the project and then they were supplied with the test data in order to report their conclusions based upon their particular techniques. "Generated" data of this sort were considered more reliable than "real" data due to the problems associated with data collection such as mis-diagnosis and failure to discover all the cases.

It became evident from Dr. Boyle's talk that using such generated data as input to the various analytic methods gave extremely poor results. In a number of cases false positive clusters were detected while the real generated clusters were either reported correctly or not at all. There was a wide disparity amongst the methods used and one could only come away with the conclusion that the whole statistical methodology for cluster detection is fraught with difficulty. On the basis of this study, Dr. Boyle concluded that the idea of "trawling" through masses of medical records with a view to revealing clusters should be resisted at all costs as it would be most unlikely to reach any satisfactory conclusions.

Following a coffee break, Dr. Judith Hall who is Professor and Head of the Department of Paediatrics at UBC Children's Hospital in Vancouver, spoke about non-traditional inheritance. Dr. Hall is a well established paediatric geneticist and approached the problems from a genetic point of view. She did not address the specific issue of radiation induced leukaemia but did point out that a number of new genetic methods have demonstrated the dependency of a number of disease states on parental gene loss and duplication giving recessive diseases which skip generations.Dr. Hall emphasized that there is a lot of new and unexpected information being revealed from genetic studies and the new ability to use genetic markers will advance this area rapidly. Dr. Hall emphasized the need to study the DNA of both parents and grandparents in cases of childhood leukaemia and said that she felt this would lead to a better understanding of the mechanisms underlying the causes of the disease.

Dr. Clark Heath who is Vice-President of Epidemiology and Statistics at the American Cancer Society presented a review of various epidemiological studies of leukaemia clusters in the United States. Clusters can take the form of groupings in time, space, time/space and common community factors such as attending the same school or all the soldiers involved in the A-bomb tests. The clusters described by Dr. Heath were those of time/space variety. The first one was in a new community in North Chicago where a school teacher observed that two children in the school were diagnosed with leukaemia within a short period. This alerted the community to investigate further and discover that a number of children were similarly diagnosed. Dr. Heath then described two other clusters that he had investigated in towns east of the atomic test sites in Nevada. In one case there had been an incidence of seven leukaemias and in the other case, four leukaemias in towns of very small sizes so that the observed over expected ratios for the areas were astronomically high. Although Dr. Heath presented the various numbers associated with the clusters he had investigated, he had been unable to draw any conclusions except for the fact that they may well have been caused purely by chance.

In another study in which Dr. Heath had been involved in the Atlanta area, it appeared that there was some weak evidence of clustering but this seemed to depend on the particular boundaries of the areas that were chosen and the particular time intervals involved.

Another study in which he had significant involvement was the National Cancer Institute investigation of nuclear facilities carried out in 1990 in response to the Gardner paper. This study involved 62 nuclear facilities and 107 study counties were chosen with 292 matched control counties. The cancer mortality was investigated between the years of 1950 and 1984 with a total of 900,000 deaths involving 37,500 leukaemias. Of these deaths,

350,000 were pre-start-up and 530,000 were post-start-up of the various nuclear facilities. A comparison was made between the pre- and post-startup numbers and divided into five year intervals. When plots were made of the relative risk derived from the standardized mortality ratios with the study groups compared to controls, it was evident that there was no real change and indeed, one might conclude from the data that the risk was higher in controlled counties than in the study counties, and, further, that the risk in the study counties was higher prior to startup of the nuclear facilities.

Dr. Heath claimed that there was considerable power in the methodology that was used as was demonstrated in other situations, but that no correlation between the incidence of leukaemia and the presence or absence of nuclear facilities could be demonstrated in these cases. He concluded by emphasizing the problems associated with any study of clusters; these were: the latency period before any disease condition manifests itself, the specificity, or perhaps one should say, the nonspecificity, of leukaemia with respect to radiation; the low numbers involved in any cluster situation; and the extreme difficulty in establishing radiation exposures in any of these cases.

Unfortunately, Dr. Heath's presentation was rudely interrupted by a false fire alarm so that he was obliged to complete his presentation following the lunch break. The next speaker scheduled for the afternoon session was Dr. Gerald Draper from the Childhood Cancer Research group at the University of Oxford who presented a synopsis of the epidemiological studies of childhood leukaemia around nuclear facilities in the United Kingdom. In a sense this was a review of the initial work by Gardner and the other investigations which this had instigated. Dr. Draper spoke with respect to three clusters in the U.K., one at Seascale (Sellafield), the second at Dounray and the third at Aldermaston.

According to Gardner's paper from 1987, the incidence of childhood leukaemia in the village of Seascale was ten times greater than expected and that for other childhood cancers was four times greater than expected. It was also of interest that there was a higher incidence among children born (and therefore conceived?) in the area compared to those who had moved into the area after birth. A later paper by Gardner had established that the father's radiation dose was correlated with the incidence of leukaemia and that the incidence was 6.4 times that expected for doses in excess of 100 mSv. One should emphasize that the confidence limits placed upon this ratio ranged from 1.5 to 26. A second cluster had been observed in a circle of radius 12.5 km surrounding the Dounray fast breeder reactor for a small period in the years from 1979-84 in the age group from 0 - 24 years. Dr. Draper pointed out that the radiation discharges from Dounray were some two orders of magnitude less than those at Seascale and there was certainly no evidence of any correlation of the incidence of leukaemia with the father's radiation dose.

In the case of Aldermaston, a cluster had been observed in which the observed over expected ratio was 1.6 for leukaemia and also other childhood cancers. However, he emphasized that this was in a population of much higher numbers and that no clusters *per se* had been observed, only an increased incidence in the area.

Dr. Draper went on to describe yet another study in which an excess of leukaemia incidents had been observed in potential reactor sites and the question arises as to whether the incidence is due to the locale in which reactor facilities are situated (they tend to be river estuaries) or the facilities themselves. He also observed that the clusters had been reported for new communities, communities in which the commuting level had suddenly increased, or communities in which there had been a sudden influx of servicemen. There are regional variations when looking at the United Kingdom as a whole and there are variations with respect to social class or socio-economic status. The higher the socio-economic score, the higher the incidence of childhood leukaemia. There may be some generalized clustering but the evidence is not strong.

The next speaker was Dr. Grosche from the Institute for Radiation Protection located in Munich, Germany. Dr. Grosche described several studies that had been carried out in what was then West Germany involving a number of nuclear facilities and appropriately chosen control regions. In these comparisons, the risk ratio in the communities close to nuclear facilities was 1.06 but this was not regarded as a significant difference from the expected ratio of one, particularly since both the incidence in the study and control areas were lower than normal anyway. Dr. Grosche also reinforced the previous speakers comments with respect to potential sites of facilities where in two studies, the risk ratios had been determined to be 1.91 and 1.42 respectively. Dr. Grosche also reported on two clusters that had been investigated. One was within a short distance of a nuclear facility, the other was at some greater distance. In both cases, the investigation had failed to reveal any underlying explanation for the higher incidence of childhood leukaemia. When questioned whether the communities might be downwind from the plants, he responded that this was not the case and further, that the natural background level was 100 times that of the plant release level.

The third speaker in the afternoon was Dr. John McLaughlin who is the senior epidemiologist at the

Ontario Cancer Treatment and Research Foundation who had been one of the co-investigators involved in the study of childhood leukaemia around the nuclear facilities in Ontario subsequent to the Gardner report in 1987. Dr. McLaughlin pointed out that this study was not one that involved clusters, but rather was an ecological study to investigate the possible etiology of leukaemia. The question that was asked was whether the incidence of childhood leukaemia differed from the provincial average. Regions of 25 km radius were considered around the Chalk River site, around Elliot Lake, Pickering and the Douglas Point reactor sites. The age groups studied were from 0 - 14 years and the time span was from 1964 through to 1986. Pooling all of the data, there was an observed versus expected ratio of 1.17 but the 95% confidence limits of this ratio ranged from .88 to 1.5. There was no question that the risk ratio was considerably less than that reported for Sellafield or even the cluster that had been observed in the region of Dounray. The conclusion was that there was no increased risk in the area of any of these nuclear facilities, but a more comprehensive study of childhood leukaemia has been undertaken and the results of this are being formulated at the moment. The study took all of the cases of leukaemia and matched these with controls, then determined the incidence of radiation in the case of the father. It had been determined that there were 11 cases in which radiation dose could be assessed and 84 controls where there was no radiation dose to the father. No further results were presented by Dr. McLaughlin since the data are presently being reviewed by the various participants in the study. We await the publication of this information with anticipation!

Dr. McLaughlin also reported on two other studies in childhood leukaemia that had been carried out across Canada. One is in Quebec where the incidence is being assessed with respect to the use of pesticides. In Ontario, a consideration is made of the variation with respect to county, environment and socio-economic status. In Quebec, BC and now also in Ontario, a study with respect to childhood leukaemia and EMF radiation is being carried out. There is also some interest in the incidence of leukaemia with respect to chemical exposure to the parent in the work environment.

The last speaker of the day was Dr. Ray Cartwright who is Director of the Leukaemia Research Fund, at the University of Leeds. He spoke to the issue of leukaemia clusters that are related to chemical agents. His first slide showed that the distribution of childhood leukaemia varies considerably world-wide. He then demonstrated the same variations exist within countries and even wide variation within counties within the U.K. Picking up on Dr. Boyle's point as the first speaker in the morning, Dr. Cartwright emphasized that there is a wide selection of analytic methods that can be used and all are subject to criticism. One such method seems to demonstrate that the risk in rural areas is three times greater than that in urban areas and he wondered whether the distribution of cigarette smoking might have some correlation to this as well as the distribution of risk associated with chemotherapy agents and benzene, neither of which should be regarded as being uniformly distributed throughout the environment.

Dr. Cartwright also pointed out that correlation with causative effects is often subject to local prejudice. It was his observation that in North America, communities were frequently keen to blame ground water for various health effects whereas the popular items in the United Kingdom are EMF or, as he termed it, the "skyline" effect. To illustrate his point regarding the skyline effect, he cited a cluster of two children who had been diagnosed with childhood leukaemia who lived only 100 yards apart and were diagnosed within the same week. Their ages were six and nine. The community felt that the causative effect most certainly to be a mustard factory, the chimney of which could be seen from the area despite the fact that this factory had been in existence many years.

Dr. Cartwright noted that although the Gardner study concentrated on radiation dose, there were other industries in West Cumbria where an increased risk was demonstrated by two-fold, yet no radiation dose was present. Other studies have looked at the possible correlations between childhood cancer and parents occupations. It was evident that there was some excess risk for women in the food preparation industry and for fathers in industries using wood. Indeed, there were a number of fathers who were included in the Gardner survey who had received both radiation doses and had also been exposed to wood working in some fashion. The difficulty is that there is no demonstrated biological mechanism and with the very small numbers involved, there was a requirement for independent confirmation.

It was both Cartwright's opinion and also the consensus of all of the speakers when they met as a panel at the end of the afternoon, that cluster analysis has yielded nothing with respect to the individual clusters but has had the effect of generating considerable funding for research in the area. There seemed to be a general conclusion that the money would be better spent in terms of trying to understand the underlying mechanisms of childhood leukaemia rather than responding to each of the community interests in investigating clusters where results were never likely to provide useful information. It was agreed that the exercise of "trawling" huge data bases to search for possible clusters is unlikely to yield any useful information. Dr. Hall re-iterated her desire to see the DNA from the parents and grandparents of all

childhood leukaemias studied to determine if genetic factors could be identified.
As a member of the audience at this symposium, I would like to offer some comments concerning the organization and facilities. This symposium attracted 250 plus registrants from British Columbia in the west to the Maritimes in the east. In addition, it had some eminent speakers from Europe, the United States as well as from Canada. It seemed to me a most regrettable reflection upon Canada, when the Government Conference Centre is such an appalling facility. The acoustics were dreadful and it was not until about the last speaker of the afternoon, that the audio technologist was provoked into increasing the volume on the microphones. The facilities for presentation of slides was equally appalling. A single 35 mm projector had been provided on a wheeled trolley together with an overhead projector and a single temporary screen on a stand. With the projector placed close enough to the screen for the overhead projector to operate properly, the magnification and lighting provided by this projector were such that only the speaker and perhaps the first row of the audience could possibly see the data being presented.

At least Dr. Hall, as the second speaker, had the sense to move the projector back so that her excellent slides filled the screen and were readable. Nevertheless, the lighting was such that it could not be significantly reduced since this was the original great hall of the railroad station and has skylights all around the upper gallery. I would imagine that the Atomic Energy Control Board and in particular, the organizers of this symposium, must have been considerably embarrassed to have invited so many eminent speakers from abroad to present their material under such appalling conditions. It is to the speakers credit, that the meeting went as smoothly as it did, though I was tempted to wonder whether the lack of questions and discussion might have been due to the fact that the large proportion of the audience was unable to hear the presentations or read the slides.

As a further comment, I would also add that I was surprised that some of these speakers who must surely have presented their data in many other forums, were using such incredibly poor slides in any case. The fact that the projection facilities did not meet expectations, should not imply that the slides should not be well prepared.

This meeting hall is the one in which the Government of Canada meets with the Provincial Governments in the form of the First Ministers conferences. It may look like an entirely appropriate venue for such meetings when they are presented on television news, but for the government to even think that this meeting site could be given the name of "Conference Centre", is in my opinion, a gross distortion of the facts. The expenditure of a relatively small amount of money could improve the acoustics incredibly and surely, better audiovisual aids can be presented for speakers at symposia such as this.

Many thanks to Drs Michael Chamberlain and Lionel Reese from London for offering criticisms of the first draft of this report.

Trevor D. Cradduck, PhD, FCCPM, ABMP
March 13, 1992

HOW MANY MEDICAL PHYSICISTS IS ENOUGH ?

"Ten medical physicists sitting on the wall...
If one medical physicist should accidentally fall...."

The Institute of Physical Sciences in Medicine (IPSM) is a descendant of the Hospital Physicists Association (HPA) in the UK. As such it is concerned with the professional status of medical physicists and, in that context, recently issued a Policy Statement entitled "Recommended Minimum Staffing Levels for Medical Physics Support of Radiotherapy, Nuclear Medicine, Diagnostic Radiology and associated Radiation Protection". A copy was included in our last Newsletter.

This document, as the title suggests, has a number of recommendations concerning staffing levels and summarizes these in the form of tables in each of the specialty sections. My immediate interest was in the section on nuclear medicine where the very first recommendation is that "there must be at least two FTE physicists available" in each department. This, of course, is in addition to the "adequate support of medical physics technicians". Since most nuclear medicine departments in Canada do not have any physics support, let alone two physicists per department, my interest was piqued sufficiently to do some calculations based on the table reproduced below.

In addition to these numbers some modifications are recommended when service is provided at multiple sites and when teaching and research are carried out. In addition, when the total number from the table exceeds 7 (that is seven!) there is a reduction factor as there are expected to be some economies of scale.

Our department at Victoria Hospital has 9 scintillation cameras on two campuses. We performed 12,000 non-SPECT studies in 1990 and are projecting 13,900 in 1991. The physicists (there are two of us presently) do not process dynamic studies,

the physicians do that. We performed 1500 SPECT studies in 1990 and present projections suggest we will do 1820 in 1991. We have 11 imaging computers (4 SUN SPARC workstations) plus a host of PC's linked by Ethernet.

Given that we are a teaching hospital and that we look after the radiation protection for the hospital, the numbers I calculate are 10 physicists in 1990 and 10.5 FTE's (or is that 11?) in 1991. In fact the additional requirement for radiation protection is surprisingly low. This activity occupies a lot more of my time than the 0.1 that can be calculated from the data provided in the tables. Further, I did not include any component for the number of in and out patients we treat with unsealed sources each year.

Ten physicists in a department such as ours is a pretty staggering figure when you recognize that the total number of (nuclear medicine) physicists in the whole of Canada probably does not exceed twice, or at the very most three, times that number. I concluded that the medical physicists in the UK must be doing something beyond the scope of the mandate we normally fulfil so I referred to another IPSM Policy Statement "The Physical Scientist in Nuclear Medicine". There were no surprises here except that "the physicist MAY (emphasis is mine) have scientific responsibility for the preparation of radiopharmaceuticals....". The only significant difference is in the area of management where "the physicist HAS (again my emphasis) overall responsibility for all scientific and technical (NB NOT medical!) aspects of the work. The management role will normally include responsibility for: a) scientific staff, b) technical staff and c) departmental budget".

Even if one includes a management component, it is still difficult for me to conceive how 10 medical physicists could be gainfully employed in our department. This, then, raises several questions:

1. Is our provision of nuclear medicine services in Canada of the same standard as the UK? Do our patients receive less effective treatment when fewer medical physicists are involved?

2. Are we so much more efficient in Canada? I find that very hard to believe.

3. What do all these medical physicists in the UK do with their time? Perhaps some of our members who came from the NHS more recently can answer that question.

4. Considering the present state of the health care budget (in both Canada and the UK) is it reasonable to suggest that our organizations (COMP and CCPM) should be lobbying for more medical physicists in nuclear medicine?

5. How do the numbers compare for our other specialties? I will include the tables for radiotherapy and diagnostic radiology so that you may make your own deductions. It would be interesting to hear from other parts of the country regarding your perceptions of these recommendations.

In the March 1991 Newsletter, Mike Patterson from the Hamilton Regional Cancer Centre and Jake van Dyk from the Ontario Cancer Institute published some recommendations for staffing levels in the Ontario Cancer Foundation. They used several references to arrive at their conclusions and admitted that the numbers that resulted from their proposal were "significantly lower than" those published by the IPSM in an earlier Policy Statement on radiotherapy. This would tend to support my own analysis of the data for nuclear medicine. Is anyone in a position to comment on the data for diagnostic radiology?

Tables of Minimum Requirements

Radiotherapy

Component	*Item*	*FTE's/item*	*Notes*
Equipment Dependent Factors			
1	1 Special accelerator	0.7	1,2
2	1 Standard accelerator	0.5	1,2
3	1 Major item	0.4	3,2
4	1 Minor item	0.2	4,2
Patient Dependent Factors (patients per year)			
5	1000 New patients - - external beam	1.2	5
6	100 New patients - brachytherapy	0.2	6
7	100 New in-patients, -unsealed sources	0.3	
8	100 New out-patients, -unsealed sources	0.1	

Notes:

1. Special accelerator - more than 1 X-ray energy or has electron facility. When computer controlled add 0.2 physicists per machine.
2. Reduce by 0.1 if maintenance and repair not done by staff responsible to physicist.
3. Major item is Co-60, afterloading machine, simulator or computer treatment planning system.
4. Minor item is ortho-voltage treatment or low/medium dose rate afterloading machine.
5. May be reduced by up to 0.4 if carried out by staff not supervised by physicist.
6. Increase by 0.1 if substantial fraction treated with Ir wire or I-125.
7. If the total, N, from the table exceeds 7, reduce using formula:M=7+(N-7)/2

Nuclear Medicine

Component	*Item*	*FTE's / item*	*Notes*
1	1 Gamma cameras	0.5	1,2
2	1000 Examinations / yr	0.1	1
3	500 Dynamic studies processed by physicist	0.25	1
4	250 SPECT studies / yr	0.25	1

Notes:
1. Additional staff required for sample counter or whole body counter.
2. Reduce for second and subsequent cameras if used for static imaging.
3. If the total, N, from the table exceeds 7, reduce using formula: M=7+(N-7)/2

Diagnostic Radiology

Component	*Item*	*FTE's / item*	*Notes*
1 Equipment Dependent Factor			
	250 X-ray tubes	1	1
	1 X-ray bone densitometer	0.25	4
2 Patient Dependent Factor			
	500 X-ray tubes	1	2
	1000 bone density studies	0.1	4
3 Implementation of breast screening program			
	One NHS Region	1	3

Notes:
1. To cover QC duties but not for breast screening or radiation protection.
2. To cover work arising from radiation protection (of the patient) regulations (i.e. HARP Commission in Ontario)
3 To cover breast screening program
4 Assumes that physicist provides calibration and QC and has direct involvement in data acquisition and processing.

Radiation Protection

Component	*Item*	*FTE's / item*	*Notes*
Equipment Dependent Factor			
1	100 Diagnostic X-ray tubes	0.3	2
2	1 Major radiotherapy item	0.01	1
3	1 Minor radiotherapy item	0.005	1
4	1 Surgical laser	0.025	
5	1 UV/microwave/shortwave unit	0.005	
6	1 Contamination/survey meter	0.001	
7	1 Diagnostic quality dosemeter	0.002	
Employee Dependent Factor			
8	1000 Employees covered - includes rad. protection in diagnostic radiology	0.02	3
9	1000 Employees covered - covers management of monitoring service	0.02	
10	1000 Employees covered - includes nuclear medicine and research labs, etc	0.01	3

Notes:
1. As per radiotherapy .
2. To be added to the requirement for diagnostic radiology.
3. To be added to the requirement for nuclear medicine.

NOTE: In all of the above cases increase the numbers derived from the tables by 20% if teaching and research are performed. Additionally, if service is provided to more than one site (Winnipeg is a good example for nuclear medicine), then the number must be increased by 10% for each site served.

Example: Number of Physicists
Victoria Hospital, London - 1990

Item	No.	FTE	Total
Cameras	9	0.5	4.5
Exams(non-SPECT)	12k	0.1	1.2
Dynamic studies	0	0.25	0
SPECT	1.5k	0.25	.1.5
			7.2
Reduce by factor since > 7.0			7.1
Add 20% for research/teaching			1.44
Add 10% for each site served(2)			1.44
Radiation protection component			0.106
		TOTAL	**10.086**

Number of FTE's required = 10
Number of FTE's on staff = 2

T.D. Cradduck, PhD, FCCPM, ABMP
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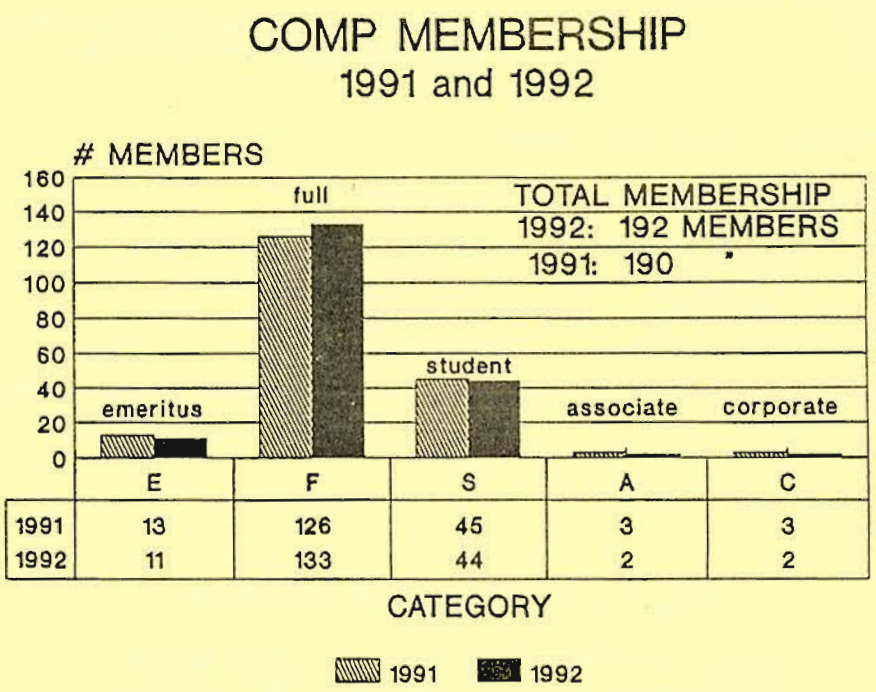
University of Western Ontario London, Ont, Canada

COMP Membership Summary

Raymond Carrier has compiled the membership figures for the new year. These are reviewed below. Since memberships are still being renewed the data should be considered preliminary.



Voici quelques commentaires quant à la situation du membership au 15 mars 1992. Les chiffres indiqués sont quelque peu plus faibles que ceux déjà publiés dans le répertoire des membres en juin 1991. Cela s'explique par le fait que dans le comptage précédent on avait inclus les membres ou fellows du CCPM qui n'étaient pas en règle avec l'organisation. Le comptage qui est maintenant fait et mis en comparaison est strictement relié au fait d'avoir payé sa cotisation.

De plus les chiffres de 1991 sont ceux obtenus après le bilan complet qui s'est terminé à l'automne avec queques paiements en retard. Donc au 15 mars 1992, suite à des rappels très visibles, nous sommes en avance sur les années antérieures. Quelques membres retraités ont choisi d'être rayés des listes d'où l'écart observé.

La politique de "joint membership" avec la CAP nous a attiré quelques nouveaux membres. C'est également le cas avec la politique de réduction de prix négociée avec l'AAPM: il n'est cependant pas possible de déterminer le nombre exact.

Raymond Carrier, secrétaire de l'OCPM

Newsletter Announcements

Addresses for Submissions:

Until a local contact network is established, submissions should be sent to

L. John Schreiner
Medical Physics Department
Montréal General Hospital
1650 Cedar Ave,
Montréal, QC.
H3G IA4

tel: (514) 934-8052
fax: (514) 934-8229

E-mail can be sent to me at McGill University at:
CXLS@MUSICA.MCGILL.CA.

Newsletter Schedule: The newsletter schedule is :

issue	submission deadline	mailing date
Fall issue:	2nd week Nov.	1st week Dec.
Winter issue:	2nd week Feb.	1st week March.
Spring issue:	2nd week May	1st week June
Summer/Fall issue:	3rd week of August	2nd week Sept.

1991 COMP SALARY SURVEY

There were 63 respondents to the salary survey questionnaires set out in December 1991, a slight decrease from last year. To preserve confidentiality, the number of respondents per category and region has been omitted. Salary ranges are given instead of standard deviations because of the small number of respondents in many of the categories.

As with last year's survey a great deal of credit is due Sherry Connors, who organized and completed much of the analysis, and without whose help the results would most certainly not be available this early.

Readers are encouraged to comment on survey methods, as both the general philosophical perspective and implementation details undoubtedly could benefit from further refinement. Please address comments to myself or Sherry.

Thanks to all who participated in this year's survey.

Ron Sloboda,
COMP Member

ALL RESPONDENTS - TOUS RESPONDANTS

Number of Respondents = 63

PRIMARY FIELD	MOYENNE AVERAGE	RANGEE RANGE	MEDIAL MEDIAN	DISCIPLINE PRINICPALE
Service	$61,727	$40,000 - $86,500	$60,445	Service
Research and Development	$70,110	$50,000 - $95,000	$66,000	Recherche et Development
Administration	$78,000	$45,000 - $115,000	$80,500	Administration
DEGREE				**DEGREE**
Ph.D.	$71,030	$40,000 - $115,000	$72,884	Ph.D
M.Sc	$60,496	$41,334 - $93,000	$59,890	M.Sc.
B.Sc.	$53,250	$45,000 - $63,000	$52,500	B.Sc.
CERTIFICATION				**CERTIFICATION**
FCCPM	$71,559	$48,000 - $95,000	$72,767	FCCPM
MCCPM	$53,380	$40,000 - $70,500	$54,500	MCCPM
Other	$69,667	$45,000 - $93,000	$71,000	Autre
None	$63,974	$41,000 $115,000	$62,000	Aucune
PRINCIPAL EMPLOYMENT				**EMPLOYEUR PRINICPAL**
General Hospital	$59,561	$40,000 - $84,000	$57,540	Hopital general
Cancer Institute	$67,028	$41,000 - $115,000	$64,000	Institution de Cancer
University	$70,138	$50,000 - $95,000	$62,500	Universite
Government	$63,867	$55,000 - $71,000	$65,600	Gouvernement
Other	$78,500	$60,000 - $95,000	$79,500	Autre
YEARS OF EXPERIENCE				**ANNEES D'EXPERIENCE**
less than or equal to 5	$52,072	$41,000 - $80,000	$53,000	plus ou egale a 5
less than or equal to 10	$59,238	$40,000 - $78,700	$61,000	plus ou egale a 10
less than or equal to 15	$74,947	$50,000 - $115,000	$73,750	plus ou egale a 15
greater than 15	$70,667	$57,000 - $80,000	$75,000	plus que 15
DISCIPLINE				**DISCIPLINE**
Radiotherapy	$63,695	$40,000 - $95,000	$62,250	Radiotherapie
Diagnostic Radiology	$65,196	$50,000 - $80,000	$60,000	Radiodiagnostique
Nuclear Medicine	$70,859	$50,000 - $84,000	$75,000	Medecine Nucleaire
Magnetic Resonance Imaging	$83,000	$61,000 - $95,000	$93,000	Diagnostique MRI
Health Physics	$57,175	$45,000 - $71,000	$56,350	Radioprotection
ACADEMIC RANK				**RANG ACADEMIQUE**
Lecturer/Instructor	$56,842	$48,000 - $70,500	$57,000	Instructeur
Assistant Professor	$62,897	$41,751 - $84,000	$61,750	Professeur Assistant
Associate Professor	$73,742	$58,000 - $90,000	$72,767	Professeur associate
Full Professor	$81,333	$75,000 - $94,000	$75,000	Professeur
Others/None	$59,226	$40,000 - $93,000	$58,795	Autre/Aucune
RANK				**RANG**
Director/Chief or Head	$82,264	$45,000 - $115,000	$87,000	Directeur/Chef ou Tete
Senior	$71,235	$57,000 - $86,500	$73,000	Physicien superieur
Intermediate	$56,425	$40,000 - $69,000	$55,000	Physicien intermediate
Junior/Trainee	$43,164	$41,000 - $50,000	$41,876	Physicien cadet
REGION				**REGION**
Maritimes	$61,967	$42,900 - $90,000	$53,000	Maritimes
Quebec	$58,789	$40,000 - $95,000	$57,390	Quebec
Ontario	$68,377	$41,000 - $115,000	$65,600	Ontario
Western Provinces	$68,857	$42,000 - $93,000	$70,500	Provinces de l'ouest

PH.D RESPONDENTS - RESPONDANTS AVEC GRADE PH.D

Number of Respondents = 36

PRIMARY FIELD	MOYENNE AVERAGE	RANGEE RANGE	MEDIAL MEDIAN	DISCIPLINE PRINCIPALE
Service	$64,734	$40,000 - $86,500	$65,500	Service
Research and Development	$72,791	$50,000 - $95,000	$72,767	Recherche et Development
Administration	$100,000	$90,000 - $115,000	$95,000	Administration
DEGREE				**DEGREE**
Ph.D.	$71,030	$40,000 - $115,000	$72,884	Ph.D
CERTIFICATION				**CERTIFICATION**
FCCPM	$74,241	$50,000 - $95,000	$75,000	FCCPM
MCCPM	$51,000	$40,000 - $55,000	$54,500	MCCPM
Other/None	$72,355	$41,000 - $115,000	$74,506	Autre/Aucune
PRINCIPAL EMPLOYMENT				**EMPLOYEUR PRINCIPAL**
General Hospital	$67,875	$40,000 - $84,000	$72,500	Hopital general
Cancer Institute	$70,660	$41,000 - $115,000	$73,000	Institution de Cancer
University	$72,211	$50,000 - $95,000	$67,634	Universite
Other	$78,000	$60,000 - $95,000	$79,000	autre
YEARS OF EXPERIENCE				**ANNEES D'EXPERIENCE**
less than or equal to 5	$54,894	$41,000 - $80,000	$54,500	plus ou egale a 5
less than or equal to 10	$60,950	$40,000 - $78,700	$63,500	plus ou egale a 10
less than or equal to 15	$79,861	$58,000 - $115,000	$79,006	plus ou egale a 15
greater than 15	$77,500	$75,000 - $80,000	$77,500	plus que 15
DISCIPLINE				**DISCIPLINE**
Radiotherapy	$66,405	$40,000 - $95,000	$62,500	Radiotherapie
Diagnostic Radiology	$69,961	$58,000 - $80,000	$71,384	Radiodiagnostique
Nuclear Medicine	$74,335	$53,000 - $84,000	$77,006	Medecine Nucleaire
Magnetic Resonance Imaging	$83,000	$61,000 - $95,000	$93,000	Diagnostique MRI
ACADEMIC RANK				**RANG ACADEMIQUE**
Assistant Professor	$61,616	$41,751 - $84,000	$57,200	Professeur Assistant
Associate Professor	$72,477	$58,000 - $90,000	$71,384	Professeur associate
Full Professor	$81,333	$75,000 - $94,000	$75,000	Professeur
Other/None	$63,525	$40,000 - $80,000	$70,725	Autre/Aucune
RANK				**RANG**
Director/Chief or Head	$91,667	$79,000 - $115,000	$93,000	Directeur/Chef ou Tete
Senior	$71,504	$58,000 - $86,500	$74,000	Physicien superieur
Intermediate	$53,833	$40,000 - $66,000	$54,500	Physicien intermediate
Junior/Trainee	$41,376	$41,000 - $41,751	$41,376	Physicien cadet
REGION				**REGION**
Maritimes	$71,500	$53,000 - $90,000	$71,500	Maritimes
Quebec	$62,610	$40,000 - $95,000	$60,000	Quebec
Ontario	$73,756	$41,000 - $115,000	$75,000	Ontario
Western Provinces	$72,196	$54,000 - $93,000	$74,425	Provinces de l'ouest

M.Sc. RESPONDENTS - REPONDANTS AVEC GRADE M.SC.

Number of Respondents = 23

PRIMARY FIELD	MOYENNE AVERAGE	RANGEE RANGE	MEDIAL MEDIAN	DISCIPLINE PRINCIPALE
Service	$58,811	$41,334 - $86,400	$57,700	Service
Administration	$74,667	$60,000 - $93,000	$71,000	Administration
DEGREE				**DEGREE**
M.Sc.	$60,496	$41,334 - $93,000	$59,890	M.Sc.
CERTIFICATION				**CERTIFICATION**
FCCPM	$68,200	$48,000 - $93,000	$64,000	FCCPM
MCCPM	$54,967	$41,334 - $70,500	$54,040	MCCPM
None	$57,022	$42,000 $74,500	$57,700	Aucune
PRINCIPAL EMPLOYMENT				**EMPLOYEUR PRINCIPAL**
General Hospital	$52,497	$42,900 - $60,000	$53,500	Hopital general
Cancer Institute	$63,182	$41,334 - $93,000	$63,000	Institution de Cancer
YEARS OF EXPERIENCE				**ANNEES D'EXPERIENCE**
less than or equal to 5	$48,848	$41,334 - $57,700	$50,000	plus ou egale a 5
less than or equal to 10	$59,898	$48,000 - $70,500	$60,945	plus ou egale a 10
less than or equal to 15	$70,342	$57,080 - $93,000	$64,100	plus ou egale a 15
DISCIPLINE				**DISCIPLINE**
Radiotherapy	$60,872	$41,334 - $93,000	$60,945	Radiotherapie
Other	$59,140	$41,334 - $71,000	$57,700	Autre
ACADEMIC RANK				**RANG ACADEMIQUE**
Lecturer/Instructor	$57,198	$48,000 - $70,500	$57,040	Lecturer/Instructeur
Other/None	$62,255	$41,334 - $93,000	$62,000	Autre/Aucune
RANK				**RANG**
Director/Chief or Head	$70,425	$57,700 - $93,000	$65,500	Directeur/Chef ou Tete de departement
Senior	$70,480	$57,000 - $86,400	$70,500	Physicien superieur
Intermediate	$57,370	$48,000 - $69,000	$57,080	Physicien intermediate
Junior/Trainee	$42,078	$41,334 - $42,900	$42,000	Physicien cadet
REGION				**REGION**
Maritimes				Maritimes
Quebec	$54,963	$48,000 - $60,000	$57,040	Quebec
Ontario	$64,349	$41,334 - $93,000	$63,000	Ontario
Western Provinces	$62,178	$42,000 - $74,500	$64,000	Provinces de l'ouest

AUGMENTATIONS, BENEFICES ET REVENU DE CONSULTATION
DATA ON INCREASES, BENEFITS AND CONSULTING

PERCENT INCREASE BETWEEN 1990-1991 SALARIES — *POURCENTAGE D'AUGMENTATION SALAIRE 1990-1991*

	AUGMENTATION TOTAL Overall Increase	*COUT DE VIE* Cost of Living	*MERITE* Merit	
Maritimes	8.9	4.7	4.3	*MARITIMES*
Ontario	5.5	2.8	1.7	*ONTARIO*
Quebec	5.9	3.5	2.1	*QUEBEC*
Western Provinces	6.3	3.3	3.8	*PROVINCES DE L'OUEST*

AVERAGE CONSULTING FEES BY FIELD — *FRAIS DE CONSULTATION EN MOYENNE PAR DISCIPLINE*

	Honoraire par heure Hourly Fee	*Honoraire par jour* Daily Fee	*Revenu Annuel* Annual Income
Diagnostic Radiology	$83	$525	$4,500
Nuclear Medicine	$75		$1,900
Radiotherapy	$50	$400	
Teaching	N/A	N/A	$1,957

PERCENTAGE OF REPONDENTS HAVING 50% PREMIUM PAID BY EMPLOYER
POURCENTAGE DE REPONDANTS POUR QUI L'EMPLOYEUR CONTRIBUE 50% AUX BENEFICES

Provincial Health Care	83%	*Assurance medicale*
Suppl. Health Care	73%	*Ass. Medicale supp*
Dental	88%	*Plan dentaire*
Group Insurance	81%	*Assurance vie*
Disability	84%	*Ass. d'incapacite*
Private Pension Plan	94%	*Pension de retraite*
Sabbatical	25%	*Conge de recherche*
Tuition(self)	28%	*Instruction soi-meme*
Tuition(dependent)	13%	*Instruction dependant*

The majority of respondents had 50% of their benefits premiums paid by employer with the exception of sabbaticals and tuitions. Tuitions for the employee may be covered by professional allowance. Sabbaticals and tuitions in general were associated with academic rank.

1991 CANCER INSTITUTION SALARIES & BENEFITS

Province	Salary Range (Steps)		Annual	Benefits		
	Intermediate	*Senior*	Adjustments†	*Vacation*	*Travel*	*Prof.Allow.*
B.C. (CCABC, 1-Apr-91)	55.4 - 64.7K (5) Max. Merit 72.8K	67.3 - 78.7K (5) Max. Merit 88.7K	C, S	5 weeks + 1 after 15 yrs	$3000	$1000
ALBERTA (ACB, 1-Apr-91)	49.8 - 63.8K	61.3 - 79.0K	B	4 weeks + 1 after 2 yrs + 1 after 15 yrs	$2450	$800
SASKATCHEWAN (SCF, 1-Apr-91)	49.6 - 61.6K (6) + $2000 for supervision	63.4 - 77.8K (6)	C, S	4+2 weeks + 1 after 10 yrs	$2800*	$500
MANITOBA (MCTRF, 1-Oct-91)	48.7 - 64.1K (6)	61.6 - 72.5K (6)	C, S	4 weeks + 1 after 10 yrs	Dept. budget	none
ONTARIO (OCF, 1-Apr-91)	52.7 - 64.1K (6) + $1500 - $5500 prorated market reten. + 6% for supervision	65.4 - 76.5K (5)	C, S	4 weeks + 1 after 15 yrs	Dept. budget	$850
QUEBEC (Hospital, 1-Apr-91)	40.6 - 54.3K (9) with minimum of M.Sc.		C, S	4 weeks	Travel & prof. expenses from Dept. budget	
(Academic, 1-Apr-91)	50K+					
NOVA SCOTIA (CTRFNS, 1-Apr-91)	50.4 - 63.1K (5)	66.2 - 78.8K (5)	C, S	4 weeks + 1 after 10 yrs	Combined $2000 for travel & professional expenses	

† C = cost of living
S = progression along steps of scale
B = blended cost of living + variable merit (stepless)

* limited to $1400 for 1991

[compiled by R. Sloboda]

CCPM PRESIDENT'S PODIUM

Interest in the Canadian College of Physicists in Medicine(CCPM) appears to be at an all-time high. This year we have received a record number of requests for Membership to the CCPM, i.e. 22 in total. Considering that the College presently has 94 Members and Fellows, this represents a potential increase of over 20%. This large number of requests for Membership to the College also has the potential of a proportionately larger number of Fellowship examinations at the AAPM meeting in August in comparison to previous years. While originally we had planned only one day for these exams (August 23, 1992), we are now setting aside both Saturday, August 22, 1992 and Sunday, August 23, 1992 for the examination process. Hence, potential candidates should note these days in their calendars.

The issue of "Who needs to be certified?" was addressed in the September 1991 issue of the COMP/CCPM Newsletter. We have had relatively little response on this issue which implies that the proposal is endorsed by a very large majority of Canadian Medical Physicists and will, therefore, be presented at the annual general membership meeting of the College for formal endorsement by the membership. I would like to thank those who did submit comments. If anyone else has any outstanding concerns, please write to me as soon as possible.

As President of the College, I have had substantial correspondence and personal interaction with the Healing Arts and Radiation Protection (H.A.R.P.) Commission of the Ministry of Health of the Province of Ontario. This Commission has been very diligent in approaching the College on issues that relate to patient safety using x-rays. The H.A.R.P. Commission has developed a Strategic Plan and asked the various nominating organizations as well as the advisory committees for their input into their proposals. This short article does not allow sufficient space to deal with the issues in depth. I suggest that a future article for this Newsletter can be devoted to H.A.R.P. related activities. In brief, however, the following lists some technical and policy issues that are listed within the Strategic Plan:

1. Resolve fluoroscopy training/certification issue.
2. Resolve patient entrance exposure issue.
3. Resolve protective devices issue.
4. Encourage the development of objective image quality standards.
5. Identify H.A.R.P.'s role in nuclear medicine.
6. Resolve x-ray requisitions issue.
7. Monitor mammographic and breast screening program for Ontario to ensure they are safe and effective.
8. Introduce paediatric entrance exposure guidelines.
9. Develop patient safety guidelines for radiation therapy facilities.
10. Monitor the effectiveness of peer review systems.
11. Investigate the accreditation process
12. Facilitate professional education in radiation protection/safety.

It is clear that the H.A.R.P. Commission has developed an ambitious agenda much of which requires physics input. A large component of this work is carried out by the Physics Advisory Committee which is presently chaired by Dr. Mike Bronskill of the Reichmann Research Institute, at the Sunnybrook Health Sciences Centre in Toronto. In addition to the above issues, the CCPM is still seeking a formalization of the status of Medical Physicists as Radiation Protection Officers within the H.A.R.P. legislation.

The activities of government commissions such as the H.A.R.P. Commission emphasize once again the importance of identifying competent Medical Physicists who are able to advise on the issues as listed above. Poor advice can result in government legislation which may become very difficult to implement. In this context, both the certifying role and the educational role of the CCPM cannot be overemphasized.

Jake Van Dyk,
President, CCPM

NOTE DU PRÉSIDENT

L'intérêt envers le Collège Canadien des Physiciens en Médecine (CCPM) atteint des niveaux jusqu'ici inégalés. Un nombre record de physiciens (22) ont demandé le statut de Membre du Collège. Cela représente une augmentation potentielle du nombre de Membres de plus de 20 % puisque le Collège comporte présentement 94 Membres et "Fellows". La proportion de candidats à l'examen de "Fellow" d'août (lors de la rencotre de Calgary) pourrait de même augmenter par rapport aux années antérieures. D'ailleurs, nous aurons à consacrer deux jours plutôt qu'un à ces examens: le samedi, 22 août, et le dimanche, 23 août. Les candidats potentiels devraient retenir ces dates.

"Qui devrait être certifié?" Cette question a été posée aux lecteurs du Bulletin de septembre 1991. L'article a suscité peu de réactions. Cela implique que la

grande majorité des Physiciens Médicaux canadiens approuvent ces propositions, qui seront conséquemment soumises à l'approbation des Membres lors de la rencontre générale annuelle des Membres du CCPM. Je tiens à remercier personnellement ceux qui ont commenté ces propositions. S'il demeure des Membres ayant d'autres préoccupations concernant ces propositions, qu'ils me contactent, par écrit, dans les plus brefs délais.

En tant que Président du Collège, j'entretiens une correspondance substantielle et une implication personelle avec la commission H.A.R.P. (Healing Arts and Radiation Protection) du Ministère de la Santé de la province de l'Ontario. Cette commission a assidûment consulté le Collège sur des problèmes concernant la sécurité des patients soumis aux rayons-x. La Commission H.A.R.P. a développé un Plan Stratégique, et elle a consulté divers comités-conseils et organisations constituentes. Ce présent article ne discute pas ce sujet en profondeur. Je suggère toutefois qu'on devrait consacrer un prochain article du Bulletin aux activités du Collège reliées à cette Commission. Tout de même, je liste ici, en bref, quelques uns des sujets techniques intéressant le Plan Stratégique:

1. Certification et Entraînement en fluoroscopie.
2. La dose à la surface des patients.
3. Les appareils de protection.
4. Le développement de standards objectifs de mesure de la qualité d'image.
5. Le rôle de la Commission H.A.R.P. en médecine nucléaire.
6. Les réquisitions de radiographies.
7. Examen du programme de dépistage du cancer du sein en Ontario pour assurer l'efficacité du programme et la protection des patientes.
8. Les modalités de dose à la surface en pédiatrie.
9. Le développement de guides de sécurité pour les patients en radiothérapie.
10. Examen de l'efficacité du système d'évaluation par ses pairs.
11. L'édude des processus d'accréditation.
12. L'éducation professionnelle en radioprotection.

Il est clair que la Commission H.A.R.P. s'est donné un agenda bien chargé, et qui demande beaucoup de connaissances physiques. Le Comité-Conseil en Physique, présidé par le Dr. Mike Bronskill de l'Institut de Recherche Reichmann du Centre des Sciences de la Santé Sunnybrook de Toronto, effectue une grande partie de ces travaux. De plus, le Collège cherche à reconnaître formellement, dans la législation découlant de la Commission H.A.R.P, le rôle des physiciens médicaux en tant qu'officiers de radioprotection.

Les activités de commissions gouvernementales mettent l'emphase, encore, sur l'importance de l'identification de physiciens médicaux compétents et capables de conseiller ces commissions sur des sujets tels que ceux listés plus haut. De mauvais conseils peuvent résulter en des législations gouvernementales difficiles à implanter. De ce point de vue, les rôles de certification et d'éducation du Collège ne peuvent pas être ignorés.

Jake Van Dyk,
Président, CCPM.

REPORT OF THE COMP CHAIRPERSON

In the last 3 months COMP has accepted 3 new full members and 6 student members.

Last fall COMP was asked to review a document entitled "Guidelines on Hospital Emergency Plans for the Management of Minor Radiation Accidents" prepared by the Medical Advisors' Working Group 2 prepared at the request of AECB staff. Several of our members reviewed the document. The main concern was the total lack of reference to medical physicists as experts in radiation protection. We agreed that the document needed some revisions and we submitted our recommendations to the Group of Medical Advisors, AECB.

Our Radiation Regulations Committee has reviewed Consultative Document C122 issued by the AECB and Geoff Dean has submitted a report.

Regarding the Radiology Centennial, several of our members have been actively trying to coordinate and organize Canadian activities to commemorate this event and are also participating in activities organized by other organizations. At the present time COMP/CCPM have no concrete plans for any commemorations of their own and perhaps we should join with other societies, Canadian or international in the organization of activities and events commemorating the radiology centennial in 1995. I have written to the Radiology Centennial Inc. whose secretariat is provided by the American College of Radiology to request that COMP be a sponsoring member. RCI is a non-profit organization whose sponsors consist of approximately 40 national societies of radiologists, physicians, technologists, and other members of the radiology community (both AAPM and CAR are sponsoring members). The mandate of RCI is to plan and carry out centennial activities. Each sponsor has designated a representative to the RCI Board of Directors and has named participants on the 11 RCI committees.

COMP will form a committee for professional affairs as requested by our members at the last annual general meeting. The persons who have agreed to serve on this committee are the following; Peter Dunscombe and Peter Raaphorst from Ontario, Karen Breitman from Western Canada and John Aldrich from the Maritimes. We'd like to recruit one more person to represent Quebec. This committee will get together for the first time at our 1992 annual meeting in Calgary in August at which time they will decide on their mandate and activities. If any of our members have particular concerns that this committee should address please communicate them to any of the members.

Of interest to our colleagues in Ontario is the Regulated Health Professions Act, 1991 (RHPA) which has been developed for Ontario and is to be proclaimed there in late 1992. I have received documentation regarding this from the Ministry of Health of Ontario. The Ministry wishes to express their gratitude for the co-operation and help of the members of our organization in the development of this new health professions legislation during the last decade. Transitional councils are to be set up for all existing and self-regulating professions to help prepare for the coming into force of the legislation. Other initiatives under RHPA include; establishing the Health Professions Regulatory Advisory Council and its Secretariat, increasing the number of public members on all existing College Councils, and expanding the Health Professions Board and Health Boards Secretariat. The Ministry also wishes to develop a new Public Hospitals Act. We as medical physicists should take a close look at what this new legislation means for our colleagues in Ontario and we should keep in close contact with government agencies to keep informed and perhaps to advise on issues that will affect medical physicists. Whatever happens in Health Care in Ontario may have implications for Health Care legislation in other provinces. This is an issue that can be addressed by our professional affairs committee and all documentation I receive from the Ministry of Health in Ontario I shall pass on to the members of our Professional Affairs Committee.

Ellen El-Khatib, PH.D., FCCPM
Chairperson COMP

RAPPORT DE LA PRESIDENTE DE L'OCMP

Dans les derniers 3 mois OCMP a accepté 3 nouveaux membres et 6 membres étudiants.

L'automne dernier l'OCMP a reçu une demande d'évaluation du document "Guide pour un plan d'urgence en cas d'accidents mineurs en radiation" préparé par le Groupe de Conseillers Medicaux de la CCEA. Quelques membres de l'OCMP ont évalué ce document. La critique la plus importante a éte le manque total de référence aux physiciens médicaux comme experts en radioprotection. Nous avons conclu que le document devrait être révisé et nous avons soumis nos recommendations au Groupe de Conseillers Médicaux de la CCEA.

Notre Comité de Règlementation des Radiations a également évalué le document C122 émis par la CCEA et Geoff Dean a soumis un rapport.

Concernant le Centennaire en Radiologie, quelques uns de nos membres sont actifs pour organiser des activités Canadiennes pour célébrer ce centennaire et prennent part avec d'autres organisations à coordonner les activités pour commémorer cet événement. Actuellement, l'OCMP et le CCPM n'ont pas de plans pour des activités Canadiennes et peut-être devrions nous coordonner nos efforts avec d'autres organisations canadiennes ou internationales pour participer à des activités organisées pour commémorer le centennaire de radiologie en 1995. J'ai écris à l'organisation "Radiology Centennial Inc (RCI)" pour demander que l'OCMP deviennne membre de ce groupe. RCI est une organisation avec siège social au secrétariat de l'ACR aux Etats-Unis. Les sociétes membres sont plus de 40 organisations de radiologistes, médecins, techniciens et autres membres de la communauté de radiologie. (l'AAPM et le CAR sont membres.) Le mandat de l'RCI est d'organiser des activités de commémoration. Un répresentant de chaque organisation membre siège sur le conseil d'administration et chaque organisation membre peut nommer des participants aux 11 comites du RCI.

L'OCMP formera un comite d'affaires professionnelles comme suggéré lors de notre dernière réunion annuelle. Les personnes suivantes ont accepté de sièger sur ce comité; Peter Dunscombe et Peter Raaphorst de l'Ontario, Karen Breitman de l'ouest du Canada, et John Aldrich des Maritimes. Nous cherchons encore un membre du Québec. La première réunion de ce comité aura lieu lors de notre reunion annuelle en août 1992 à Calgary. Ils decideront alors de leur mandat et activités. Si nos membres ont des idées sur des questions qui devraient être considérées par ce comite s.v.p. communiquez avec les membres du comité.

Un sujet d'intérêt pour nos collègues en Ontario est le Regulated Health Professions Act, 1991 (RHPA) qui a été dévelopé pour l'Ontario et devrait être proclamé tard en 1992. Au sujet de ces nouveaux règlements j'ai reçu des documents du ministère de la santé de l'Ontario. Le ministère a exprimé sa gratitude pour l'aide et la coopération fournis par notre organisation durant les derniers 10 ans dans le development de cette

nouvelle législation pour les professions de la santé. Des conseils transitoires pour les professions qui existent seront formés pour s'occuper de la préparation de mise en place de la nouvelle législation. Parmis les autres initiatives concernant RHPA il y aura l'établissement d'un conseil consultatif pour la règlementation des professions de la santé et son secrétariat, une augmentation des membres du public sur tous les conseils du collège et l'élargissement du conseil d'administration pour les professions de la santé et son secrétariat. Le ministère désire également établir un nouvel acte pour les hôpitaux publics. Nos physiciens médicaux devront surveiller avec intérêt tous ces développements en Ontario, obtenir des renseignements et participer aux discussions si possible. Ce qui devient loi en Ontario peut bien avoir des implications pour nos membres dans les autres provinces. Cette question pourrait bien être une tâche pour notre comité d'affaires professionnnelles. Je ferai parvenir à ses membres toute documentation que je recevrai du ministère de la santé de l'Ontario.

Ellen El-Khatib, Ph.D., FCCPM
Presidente, OCMP

DEADLINE FOR NEXT ISSUE

JUNE 1992 NEWSLETTER

THE SCHEDULE FOR THE NEXT ISSUE OF THE NEWSLETTER WILL HAVE TO BE FOLLOWED MORE TIGHTLY THAN HAS BEEN THE PRACTICE IN THE PAST TO ENSURE THAT SOME INFORMATION REQUIRED FOR THE NEXT GENERAL MEETING IN CALGARY IS OUT IN TIME. PLEASE MAKE SURE THAT ITEMS TO APPEAR IN THIS ISSUE ARE IN MY OFFICE BY MAY 15TH, 1992.

THE NEWSLETTER WILL BE MAILED BY JUNE 5TH AT THE LATEST

CCPM EXAM SCHEDULE

The schedule for application and sitting of the 1992 fellowship exam is:

apply by:	June 19,1992
exam date:	August 23, 1992

Newsletter Submissions
Format for contributions:

Articles for the Newsletter are best submitted by E-mail (at CXLS@MUSICA.MCGILL.CA.) or on computer disk. The Newsletter is produced on a MacIntosh computer so submissions must be on Mac compatible disks or on 31/2 inch IBM disks in text or ASCI format. Please send a hard copy by mail or FAX so that any symbols or special characters can be verified.

Good quality, formatted submissions for direct use are also welcome. This reduces the work in setting-up the newsletter considerably. The final quality of the newsletter is limited by the quality of the submissions since articles are used directly. Newsletter articles should be single or double column on 8 1/2 by 11 inch paper with 1 inch margins on the sides and top and 1/2 inch on the bottom, if using two columns leave 1/2 inch between columns. Contributions should be single spaced in a clear font or type, the font size / pitch should give lower case letters that are ~2 mm high with ~6 lines of text per inch. If possible justify text on both margins. Please end your submission with your name and institution.

FAX submissions will have to be supported by original copy and will not be used directly.

The address and deadline for submissions are given on page 10 of this issue.

AAPM/COMP MEETING - AUGUST, 1992: SCIENTIFIC PROGRAM

Brian McParland and his committee have put together a most interesting program with a cast of speakers whose presentations exhibit an impressive combination of relevance, authority and wit. Of particular interest to Canadian medical physicists will be a joint APPM/COMP/CCPM symposium and a Harold Batho Memorial Lecture.

The joint symposium to be held on the afternoon of Tuesday, August 25 is entitled "The Roles of Three-Dimensions in Medical Imaging and Radiotherapy Planning". The moderator will be the Honourable Sylvia Fedoruk, Lieutenant Governor of Saskatchewan to be introduced by Trevor Cradduck, one of her former graduate students at the University of Saskatchewan. We understand that, in addition to acting as referee, Sylvia will give us a brief overview of the history of medical physics in Canada. The main presentations will be by Terry Peters (Montreal), Jerry Battista (London) and William Feindel. Dr. Feindel, while in Saskatoon in the 50's collaborated with Harold Johns and Bill Reid in the development of the "two-headed" brain scanner. He later accepted a position at the Montreal Neurological Institute and then succeeded Dr. Wilder Penfield as Director.

The Harold Batho Memorial Lecture, which will be held in the afternoon of Wednesday, 26 August, is unique and was proposed solely for this meeting. It appears that this is the first time a Canadian has been honoured by the AAPM with a memorial lecture. Dr. Batho, a Manitoban, became the first head of the physics department of the Vancouver Cancer Clinic (now the Maxwell Evans Clinic of the CCABC) in the 50's. His fruitful collaboration with Margaret Young in developing methods for marking inhomogeneity corrections and his role in establishing the biomedical program of TRIUMPF are particularly noteworthy. The Memorial Lecturer will be Jack Cunningham, the 1988 winner of the AAPM's Coolidge Award for outstanding contributions to medical physics.

Other sessions will deal with such fascinating and timely topics as the legal aspects of medical physics, comparison of Canadian and US health care systems, biological modelling and computerized image analysis.

D.V. Cormack

COMP/CCPM/CMBES JOINT CONFERENCE

May 12 - 15, 1993, Carleton University, Ottawa

The 1993 Canadian medical physics meeting will be held in Ottawa in conjunction with the annual meeting of the Canadian Medical and Biological Engineering Society (CMBES). This will be the first formal meeting of the two groups and will provide an opportunity for exchange of information between medical physicists and biomedical engineers, with whom we have many common interests in health care.The CCPM and CMBES will co-sponsor a symposium of invited speakers on the subject of "Lasers in Medicine".

Immediately following the conference, the Ionizing Radiation Standards group of the NRC is proposing to hold a Measurement Seminar for medical physicists. Primary exposure and air kerma standards for x ray and Co-60 beams, absorbed dose standards for Co-60 and higher-energy photons, and dosimetry standards based on protocols such as TG-21 would be covered.

The Local Arrangements Committee for the Conference is:

COMP/CCPM	CMBES
Paul Johns	Derek Utley
Robert Clarke	Frank Johnson
Terry Peters	Brian Winchester
Peter Raaphorst	Henry Benoit
Ken Shortt	Sally Chapman
Mazen Soubra	Dennis Heller

Calendar of Events

August 23 - 27, 1992
Calgary, Alberta
34rd Annual Meeting of AAPM and COMP
Contact: AAPM Exec Office, 335 East 45th St,
NEW YORK, NY 10017,USA

August 30 - September 4, 1992
Banff Centre, Banff, Alberta
AAPM Summer School,
The Physics of Magnetic Resonance Imaging
Contact: AAPM Exec Office, 335 East 45th St,
NEW YORK, NY 10017,USA

September 16 - September 19, 1992
Edgewater Hotel, Madison, Wisconsin
Prediction of Response in Radiation Therapy:
Radiosensitivity and Repopulation
Hosted by the University of Wisconsin and the AAPM
Contact: Dr. B.R.Paliwal, U. of Wisconsin Hospital
Department of Human Oncology
600 Highland Ave., K4/B 100
Madison, WI 53792

Medical Physics Theses and Abstracts

As I stated in the last issue I plan to publish the **titles and abstracts** of Canadian theses related to medical physics (for degrees awarded in 1991) in the **June issue** of the Newsletter. This is intended to advertise the detailed work covered in these theses so that the community can take advantage of the work of students across the country. To date I have received 23 replies to this announcement; these are reviewed below. Note that in some cases not all the information I intend to present is on file here in my office. Please contact me soon so that I can update the files before the next issue's submission deadline.

Please make sure that your work or your student's work is submitted for publication. It would be unfortunate to miss out on some research. There are a number of universities and programmes with no representation at this time, therefore, I suspect that the list below is not yet complete.

Submissions are best sent by E-mail as retyping is a pain (see instructions for submission to the Newsletter).

John Schreiner

Summary of information on file for next issue's publication of abstracts of theses by students obtaining degrees in medical physics related work in 1991.

University	*Author*	*Title*	*Abstract*	*Degree*	*Depart.*	*Supervisor*
Alberta	Petrikowski	√	?	M.Sc.	?	Overton
	Ho	√	?	M.Sc.	?	Allen
Carleton	Dokht	√	√	M.Sc.	?	Clarke /Jarosz
	Older	√	√	M.Sc.	?	Johns
	Weber	√	√	M.Sc.	?	Gerig
	Zakhour	√	√	M.Sc.	?	Raaphorst
Manitoba	Chantziantoniou	√	√	M.Sc.	?	Sourkes
	Leszczynski	√	√	Ph. D.	Physics	Shalev
	St. Lawrence	√	√	M.Sc.	Physics	Dunscombe/Bews
McGill	Audet	√	√	M. Sc.	Med. Physics	Schreiner
	Bissonnette	√	√	M. Sc.	Med. Physics	Schreiner
	MacDonald	√	√	M.Sc.	Med. Physics	Fallone
	Ryner	√	√	M.Sc.	Med. Physics	Fallone
Queens	Baldwin	√	√	M.Sc.	?	Shragge
	Carlone	√	√	M.Sc.	?	Shragge
Toronto	Hardy	√	√	Ph.D.	Med. Biophysics	Henkelman
	Newcomb	√	√	M.Sc.	?	van Dyk
	Turnbull	√	√	Ph.D.	Med.Biophysics	Foster
	Urchuk	√	√	M.Sc.	Med.Biophysics	Plewes
Western Ontario						
	Breen	√	√	M.Sc.	Med. Biophysics	?
	Mason	√	√	M.Sc.	Med.Biophys. and LRCC	Battista.
	Rickey	√	√	M. Sc.	Med. Biophysics	?
	Tong	√	√	M.Sc.	Physics	?

Medical Physics in Canada

Canadian College of Physicists in Medicine

Le Collège Canadien des Physiciens en Médecine

COMP OCPM

Organisation Canadienne des Physiciens Médicaux

Canadian Organization of Medical Physicists

Our medical physics brochure has been printed and a copy is included with this newsletter. Further copies are available from the addresses given in the brochure. Small quantities of the brochure will be provided free of charge. We are hoping that those requesting more than ten copies for redistribution can make a voluntary donation of $1.00 per copy to the CCPM HE Johns Travel Fund. Printing costs were approximately $2.00 per copy with one half of this offset by contributions from Nucletron Corporation, Theratronics International Limited and Varian/Medical Equipment. The remaining cost was shared equally by COMP and CCPM. A total of 2500 copies has been printed. Although we are hoping to offset some of the costs of the brochure, requests for larger quantities from those without funding will also be considered.

La Physique Médicale Au Canada

Canadian College of Physicists in Medicine

Le Collège Canadien des Physiciens en Médecine

COMP OCPM

Organisation Canadienne des Physiciens Médicaux

Canadian Organization of Medical Physicists

Notre dépliant de physique médicale a été imprimé et un éxemplaire est inclu avec ce bulletin d'information. Des éxemplaires supplémentaires sont disponibles aux adresses indiquées sur le dépliant. En petites quantitées, les dépliants seront fournis sans frais. Nous espérons que ceux désirant plus que dix éxemplaires afin de les redistribuer feront une contribution volontière de $1.00 par éxamplaire aux Fonds de Voyage CCPM HE Johns. Les coûts d'imprimerie fûrent de $2.00 par éxemplaire avec la motié de ceux-ci couverts par des dons de Nucletron Corporation, Theratronics International Limited et Varian/Medical Equipment. L'éxcedent du coût fût partagé également par l'OCPM et le CCPM. Un total de 2500 éxemplaires a été imprimé. Même si nous espérons récupérer les couts du dépliant, des demandes pour des quantités plus élevées par ceux sans les fonds disponibles seront aussi considérées.

John W. Andrew, FCCPM, ABMP
Registrar, CCPM

CONTEST

The editor and staff (people I occasionally grab from the streets) of the Canadian Medical Physics Newsletter wish to celebrate the production of the excellent brochure entitled *Medical Physics in Canada / La Physique Médicale au Canada.*

Although much of the work has been done already by our colleagues in Halifax, we are going to give you the opportunity to contribute to the brochure. Send in your improved captions for the various figures in the brochure. Contributions will be judged on the ability to make Michael and me fall off our seats while laughing.

Send your entries in now. Earn valuable prizes. Get YOUR name in the Newsletter.

(This contest is closed to Walter Huda unless he promises to keep sending in contributions.)

John

CANCER TREATMENT AND RESEARCH FOUNDATION OF NOVA SCOTIA
5820 University Avenue, Halifax, Nova Scotia B3H 1V7

LOCATION:	Cancer Treatment & Research Foundation of Nova Scotia Halifax, Nova Scotia, Canada
CONTACT:	Dr. John W. Andrew Director of Medical Physics Cancer Treatment & Research Foundation of Nova Scotia 5820 University Avenue Halifax, Nova Scotia, Canada B3H 1V7 Telephone: 902-428-4217; Fax: 902-428-4277

Radiation Oncology Medical Physicist

An experienced radiation oncology medical physicist is required for the Halifax clinic of the Cancer Treatment and Research Foundation of Nova Scotia (CTRF). The department of medical physics presently employs seven medical physicists and nine support staff and provides radiotherapy physics services to the Foundation and imaging physics services to adjacent hospitals.

The radiotherapy equipment includes 25 MeV and 6 MeV accelerators, two cobalt-60 teletherapy units, an orthovoltage x-ray unit, a simulator, two Selectrons and two treatment planning systems. Electronic and mechanical workshops are also available. The imaging departments are very large and provide a full range of imaging modalities including ultrasound, nuclear medicine, x-ray, CT and MRI.

Candidates must possess a postgraduate degree. Demonstrated experience or training in medical physics is required. Appointments can be at the intermediate or senior levels. Certification by the Canadian College of Physicists in Medicine (or equivalent) should be obtained within two years. Appointment to the faculty of Dalhousie University Medical School will be available to appropriately qualified individuals and staff are encouraged to further their academic, teaching, and research careers. Opportunities for graduate student supervision are available.

Salaries are competitive and professional allowances and a study leave program are also available. An additional salary increment is available for those who assume administrative responsibilities.

The Halifax metropolitan area has a population of 250,000 and is pleasantly situated on the Atlantic coast of Canada. Exceptional cultural and recreational facilities are close at hand.

KINGSTON GENERAL HOSPITAL

MEDICAL PHYSICIST

Department of Diagnostic Radiology

The Diagnostic Radiology Department of the Kingston General Hospital is presently accepting applications for the position of Medical Physicist. The Department is currently in the process of replacing or upgrading all x-ray, ultrasound and nuclear medicine equipment. Equipment includes: 5 x-ray units, 4 portable units, 2 fluoroscopy units, 2 special procedure units, 7 ultrasound units, CT, GE 1.5 Tesla MRI and 4 nuclear medicine units including SPECT. Approximately 95,000 examinations were performed in the Department last year.

The incumbent will provide support to the MRI scanner, CT, Nuclear Medicine, and Quality Assurance programs within the Department as well as to imaging equipment throughout the Hospital. The incumbent will also act as the Radiation Safety Officer for the Institution. This position offers both teaching and research opportunities.

The successful candidate will possess an M.Sc. or Ph.D. in Physics or related field plus a minimum of 3 years experience in MRI and/or other areas of Medical Imaging. Suitably qualified candidates will be eligible for a faculty appointment in the Department of Diagnostic Radiology.

Kingston General Hospital is a 423 bed tertiary care hospital, located on the shores of Lake Ontario in picturesque Kingston, a thriving, professional community that combines historic charm, scenic rural settings, as well as many cultural and sporting activities. The Hospital is associated with the Queen's University Medical School and the Health Sciences Centre and offers a competitive salary and fringe benefit package.

Interested applicants should send their resume and the names of three referees to: **Dr. Robert L. Nolan, Acting Chairman, Department of Diagnostic Radiology, Kingston General Hospital, 76 Stuart Street, Kingston, Ontario K7L 2V7.**

MANITOBA CANCER TREATMENT AND RESEARCH FOUNDATION

MEDICAL IMAGING PHYSICISTS

The Manitoba Cancer Foundation has immediate openings for medical imaging physicists, to join the present staff of nine physicists and over 40 support personnel in the Department of Medical Physics. These are regular full-time positions. We are pleased to offer a highly competitive salary and benefits package and a progressive professional setting.

Imaging physicists are responsible for clinical support in Oncology, Radiology and Nuclear Medicine in six urban hospitals throughout Winnipeg. Activities include all aspects of equipment acquisitions, acceptance testing, and quality control, radiation protection, clinical support, research, and teaching at the resident and graduate physics program levels. Current facilities include 4 high energy linacs, 2 cobalt units, 6 CT scanners, one MRI, 15 gamma cameras and a wide variety of diagnostic facilities. The minimum requirements for these positions are a Ph.D. in Medical Physics or related field and at least two years experience in clinical Medical Physics.

MCTRF is a comprehensive, world renowned oncology treatment and research center which includes all clinical departments, as well as biological and clinical research. Its location on the medical campus of the University of Manitoba offers a collegial, stimulating environment. Planning is now underway for a major expansion which will take the Foundation into the next century. A planned organizational restructuring and expansion of the Department of Medical Physics promises dynamic and challenging opportunities.

The City of Winnipeg is culturally rich, and ethnically diverse. Its charm, beauty and low cost of living add up to a desirable home community.

For immediate consideration please submit a detailed resume and three references to the contact person listed below.

Shlomo Shalev, Ph.D.
c/o Ms. Gloria Hanson
Director, Human Resources
Manitoba Cancer Treatment and Research Foundation
100 Olivia Street
Winnipeg, Manitoba
R3E 0V9 CANADA
FAX: (204) 783-6875

Director
Department of Medical Physics
Cross Cancer Institute
Edmonton, Alberta

ALBERTA CANCER BOARD

The Cross Cancer Institute, the comprehensive cancer centre that serves the population of Edmonton and northern Alberta, is seeking a Director for its Department of Medical Physics. The Institute provides specialized, state of the art diagnostic and treatment services for cancer patients, conducts cancer research and participates in professional education programs. The Department of Medical Physics, comprised of seven medical physicist positions in addition to the Director's, incorporates radiation therapy treatment planning and support of high technology equipment, particularly in the departments of Radiation Oncology, Diagnostic Radiology and Nuclear Medicine. The Institute is involved in a major, phased expansion project that will approximately double its size. Newly constructed space, including space for Medical Physics, will be ready for occupancy in July, 1992, and renovations to the existing building will be completed in 1994. Staffing increases, commensurate with increased workload, are planned. The Institute's complement of linear accelerators will increase from five to seven, with a cobalt unit completing the array of high energy treatment machines. The Institute has advanced programs in intracavitary and interstitial brachytherapy. Stereotactic radiosurgery and conformal radiation therapy are under consideration for the near future. The diagnostic programs include CT and SPECT imaging, and MRI will be introduced in the expansion project.

Medical Physicists are involved in applied research, and in the training of graduate students in physics and residents in radiation oncology. The Cross Cancer Institute is formally affiliated with the adjacent University of Alberta and all medical and scientific staff hold University faculty appointments.

The successful candidate must be a Medical Physicist, with a minimum of five years of experience, preferably within a cancer centre, and a proven track record in clinical service and scholarly pursuits. He/she must be eligible for a faculty position at the associate of full professor level, at the University of Alberta. Salary is competitive and will be commensurate with experience.

Applications should be directed to **Dr. A.L.A. Fields, Director, Cross Cancer Institute, 11560 University Avenue, Edmonton, Alberta T6G 1Z2 - by June 30, 1992.**

The Cross Cancer Institute is an equal opportunity employer. In keeping with Canadian Immigration regulations, this advertisement is directed towards Canadian Citizens and permanent residents; however others are encouraged to apply.

Our Institute is a smoke free workplace