



ANNUAL REPORT 2000

Objective

The Nederlandse Commissie voor Stralingsdosimetrie (NCS, Netherlands Commission on Radiation Dosimetry) has been established on 3 September 1982 with the main objective of promoting the appropriate use of radiation dosimetry, both for radiation research as for practical applications. The NCS is chaired by a board of scientists, installed in consultation with the supporting societies:

- Nederlandse Vereniging voor Radiotherapie en Oncologie (NVRO, Netherlands Society for Radiotherapy and Oncology);
- Nederlandse Vereniging voor Nucleaire Geneeskunde (NVNG, Netherlands Society for Nuclear Medicine);
- Nederlandse Vereniging voor Klinische Fysica (NVKF, Netherlands Society for Clinical Physics);
- Nederlandse Vereniging voor Radiobiologie (NVRB, Netherlands Society for Radiobiology);
- Nederlandse Vereniging voor Stralingshygiëne (NVS, Netherlands Society for Radiological Protection);
- Nederlandse Vereniging van Radiologisch Laboranten (NVRL, Netherlands Society of Radiographers and Radiological Technologists);
- Nederlandse Vereniging voor Radiologie (NVvR, Netherlands Society for Radiology);
- Société Belge des Physiciens des Hôpitaux/Belgische Vereniging voor Ziekenhuisfysici (SBPH/BVZF, Belgian Hospital Physicists Association).

To pursue its aims, the NCS has the following tasks:

- participation in dosimetry standardization and promotion of dosimetry intercomparisons;
- drafting of dosimetry protocols;
- collection and evaluation of physical data related to radiation dosimetry;
- maintain or establish links with national and international organizations concerned with ionizing radiation;
- promulgate information on new developments in the field of radiation dosimetry.

secretary:

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Board

In 2000 the members of the board of the NCS were:

Prof.dr. J.J. Broerse, chairman	(NVRO)	
Prof.dr. S. Vynckier, vice-chairman	(SBPH/BVZF)	
Ir. W. de Vries, secretary	(NMI)	
Dr. J. Zoetelief, treasurer	(NVRB)	
Dr. A.J.J. Bos	(NVS)	
Dr. W.C.A.M. Buijs	(NVNG)	until 14-03-2000
Prof.dr. A.A. Lammertsma	(NVNG)	from 14-03-2000
Drs. A. van Dalen	(NVvR)	
Dr.ir. F.W. Wittkämper	(NVKF)	
D. Zweers	(NVRL)	

The board of the NCS met three times in 2000, on 13 March, 13 July and 6 November. The main subjects raised at the board meetings were:

- monitoring the progress of activities by subcommittees;
- initiate the publication of NCS-reports;
- the development of new activities;

NCS-report 13 has been published in November 2000. The report was prepared by the task group "Quality Control in Brachytherapy" and is titled "Quality Control in Brachytherapy, Current practice and minimum requirements".

Several subcommittees have set the date for publication of their report in the year 2001.

Upon request of the Ministry of Social Affairs and Employment an adhoc group, of four NCS council members, was asked to advise on the dosimetric aspects of the new Directive on Radiation Protection.

Subcommittees

1. *Subcommittee "Uniformity of Dosimetry Protocols in the Netherlands"*

On December 6, 2000 the NCS subcommittee 'Uniformiteit Dosimetrieprotocollen' has gathered for its first meeting.

There still is one vacant position for a Dutch clinical physicist, which can hopefully be filled in the near future.

The subcommittee has clearly formulated its goals:

- The primary goal is uniformity of dosimetry protocols.
- The subcommittee plans to publish a self-contained new Code of Practice (CoP).
- The new CoP will be concise, clear, and easy to use in practice.
- The new CoP will apply to ionization chambers and beam qualities, used in the Netherlands and Belgium.
- The final report and the CoP of the subcommittee will contain recommendations for clinical physicists.

During the meeting on December 6, 2000 the subcommittee was informed about the status of the water calorimeter that is presently being developed at the Nederlands Meetinstituut (NMI). The Rijksuniversiteit Gent (RUG) already possesses a water calorimeter that acts as a primary standard for absorbed dose to water. Also, the planned clinical programs of the NMI (measuring correction factors for the difference in beam qualities for ionization chambers in use in Dutch

radiotherapy institutes) and the RUG (carrying out a comparison at Belgian hospitals for formalisms based on absorbed dose to water and those based on air kerma) were discussed.

Membership of the subcommittee:

Drs. A.H.L. Aalbers (chairman)
Dr. M. Pieksma (secretary)
M-T. Hoornaert
Dr. H. Palmans
Prof.dr. S. Vynckier
Dr.ir. F.W. Wittkämper

2. Subcommittee "Dose Calculations in Megavoltage Photon Beams"

The aim of the Task Group is to publish recommendations for the methods of dose calculations in megavoltage photon beam therapy. The Task group assembled 4 times in the year 2000.

In 2000 the attention was mainly focused on the set-up of an accurate monitor unit calculation method for asymmetrical fields, with or without a wedge or additional shielding blocks. An algorithm has been formulated. Measurements on different types of treatment machines and for photon energies ranging from ^{60}Co to 25 MV have been started to check assumptions and to test the formalism. These measurements were still going on at the end of the 2000. The procedure of the Task Group is to publish the results in separate papers, on which the report of MU dose calculation for asymmetrical fields can be based.

In 2000, the following paper was published:

- "Dependence of the tray transmission factor on collimator setting and source-surface distance", Med. Phys. 27, 2117-2123, 2000, Van Kleffens, H., Venselaar, J., Heukelom, S., Jager, N., Mijnheer, B., Van der Laarse, R., Van Gasteren, H., Westermann, C.

In addition, the next two letters to the editor were published:

- Comparison of parameterization methods of the collimator scatter correction factor for open rectangular fields of 6-25 MV photon beams", Letter to the Editor, Radioth. Oncol. 54, 285, 2000, Jager, N., Heukelom, S., Van Kleffens, H., Van der Laarse, R., Van Gasteren, H Venselaar, J., Westermann, C.
- Response to: "Comment on 'The effect of electron contamination on scatter correction factors for photon beam dosimetry'", Med. Phys. 27, 616, 2000, Venselaar, J., Heukelom, S., Jager, N., Mijnheer, B., Van der Laarse, R., Van Gasteren, H., Van Kleffens, H., Westermann, C.

In 2000 the Task Group is increased in staff with Dr. Milan Tomsej of the University Hospital Brussels.

Membership of the subcommittee:

Dr. J.J.M. van Gasteren (chairman)
Dr. S. Heukelom
Ir. H.N. Jager
Dr. R. van der Laarse
Dr. B.J. Mijnheer
Ir. J.P.C. van Santvoort
Dr. M. Tomsej
Dr.ir. J.L.M. Venselaar
Drs. J. Welleweerd
Ir. C.F. Westermann

3. Subcommittee "Dosimetry in Radiology"

The subcommittee on dosimetry in radiology held a meeting on February 7, 2000. Five chapters of a draft report "Dosimetry in Radiology" were discussed during this meeting. Improved drafts of the existing chapters became available later in 2000. Draft chapters on introduction and on radiation protection of workers also became available later in 2000. One of the appendices is available. At the end of 2000 the report was almost complete. Only the chapter on dosimetry and the appendix on calibration still need to be extended according to the meeting in February. A complication occurred due to a draft ICRU Report entitled "Patient Dosimetry for X-rays Used for Medical Imaging". In this draft report new symbols are proposed for quantities commonly used in patient dosimetry in radiology. This may imply that the chapter on radiation quantities and units has to be rewritten.

Membership of the subcommittee:

Dr. J. Zoetelief (chairman)
Dr. J. Geleijns (secretary)
Prof.dr. J.J. Broerse
Dr.ir. P.J.H. Kicken
W. Teeuwisse
Ir. W. de Vries
D. Zweers

4. Subcommittee "Treatment planning systems"

In 1996 the NCS installed the task group Treatment Planning Systems in order to produce a report with guidelines for the quality assurance (QA) of 3-D treatment planning systems (TPS). Early 2000 most chapters of this report had been written, but some parts still had to be filled in. The task group decided not to wait until all chapters were in final form but made the existing material available by "electronic publication" on the website of the NCS (www.ncs-dos.org) in March 2000.

In the course of 2000 a number of colleagues sent comments after reading the material and some also gave feedback after applying the report in practice. This information was used to improve the report and also missing chapters, like beam set-up and dose calculations for electron beams, were written. The task group now aims at an updated version before July 2001.

publications:

J.L.M. Venselaar, Accuracy of dose calculations in megavoltage photon beams. Thesis University of Leiden, The Netherlands, November 2000.

Membership of the subcommittee:

Dr. I.A.D. Bruinvis (chairman)
Drs. R.B. Keus
Drs. W.J.M. Lenglet
Drs. G.J. Meijer
Dr. B.J. Mijnheer
Drs. A.A. van 't Veld
Dr. ir. J.L.M. Venselaar

5. *Subcommittee "Quality assurance of brachytherapy systems"*

The task group 'Quality assurance of brachytherapy systems', established in 1997, has met five times in 2000. The work of the task group was finalized in November 2000 by the publication of NCS report 13 'Quality Control in Brachytherapy: Current practice and minimum requirements'.

A draft version of this report was previously sent to all institutions in The Netherlands and Belgium in the beginning of 2000 in combination with publication on the NCS website (www.ncs-dos.org). In this way, the institutions were informed and were asked to give comments which could be included in the final version.

A separate and dedicated report was written for ZorgOnderzoek Nederland (ZON) from whom a grant was received in 1998 to enable R.J.M. Elfrink, M.Sc., to join the task group.

In 2000 the following paper was accepted for publication in Radiotherapy & Oncology:

- RJM Elfrink, IKK Kolkman-Deurloo, HJ van Kleffens, A Rijnders, B Schaeken, AHL Aalbers, WJF Dries, JLM Venselaar. 'Determination of the accuracy of implant reconstruction and dose delivery in brachytherapy in The Netherlands and Belgium'.

A second paper on 'Quality control of brachytherapy equipment in The Netherlands and Belgium: current practice and minimum requirements' (by RJM Elfrink, IKK Kolkman-Deurloo, HJ van Kleffens, A Rijnders, B Schaeken, AHL Aalbers, WJF Dries, JLM Venselaar) will be submitted for publication early 2001.

In 2000 the following presentations were given based on the work of the taskgroup:

- RJM Elfrink, A Rijnders, B Schaeken, HJ van Kleffens, IKK Kolkman-Deurloo, AHL Aalbers, WJF Dries, JLM Venselaar. 'QA brachytherapie: van inventarisatie naar NCS aanbevelingen'. NVKF (Dutch Society for Medical Physics) Annual Conference, Doorwerth, April 14, 2000.
- RJM Elfrink, A Rijnders, B Schaeken, HJ van Kleffens, IKK Kolkman-Deurloo, AHL Aalbers, WJF Dries, JLM Venselaar. 'Quality Assurance of Brachytherapy in The Netherlands and Belgium: Current practice and minimum requirements'. 2nd Joint International Meeting ABS / GEC-ESTRO / GLAC, May 19-21, 2000, Crystal City, Virginia, USA. (Abstract: Radiotherapy and Oncology Vol. 55 suppl. 1, May 2000, p. 59).
- B Schaeken, RJM Elfrink, A Rijnders, IKK Kolkman-Deurloo, HJ van Kleffens, AHL Aalbers, WJF Dries, JLM Venselaar, 'Results of an Intercomparison of QA Brachytherapy in Belgium and the Netherlands', SBPH/BVZF 15th Symposium of the Belgian Hospital Physicist Association, Antwerpen, 3 and 4 december 1999.

Some of the activities of the task group will be finalized by the individual members. The group itself was discharged at the end of 2000.

Membership of the subcommittee:

Ir. I.K.K. Kolkman-Deurloo (chairman)
Drs. A.H.L. Aalbers
Ir. W.J.F. Dries
Ir. R.J.M. Elfrink
Ir. H.J. van Kleffens
Ing. A. Rijnders
Dr. B. Schaeken
Dr.ir. J.L.M. Venselaar

6. Subcommittee 'Electronic Personal Dosemeters'

The subcommittee has convened 4 times in the year 2000 of which on March 22 for the first time. In most countries, legal personal dosimetry is carried out by passive dosimeters like film and TLD. Electronic Personal Dosemeters (EPDs), which provide real-time dose readings, as well as alarm features, have been continuously improved and seem to have sufficient potential to play a role in the practice of radiation protection. The subcommittee has formulated as its goal to provide an inventory on the following topics:

- application areas of EPDs
- existing standards (and standards in progress) for testing EPDs
- results of comparison tests of EPDs
- commercially available EPDs

On basis of these inventories the subcommittee will report on the main advantages and limitations of EPDs and how they can be applied in a well-balanced way.

Membership of the subcommittee
Dr A.J.J. Bos (chairman)
Dr J.W.E. van Dijk
Dr J. Geleijns
ir W. de Vries
D. Zweers

Advisory platforms

Advisory platforms 'radiology and nuclear medicine' and 'radiotherapy'

During 2000 the function of the NCS as an advisory platform has been formally accepted by the Minister of Health Welfare and Sports. For the support of research projects in radiation dosimetry, interested parties should provide openings in their financial budget to support travel costs and attendance fees for meetings of the NCS platforms.

The platform on radiology and nuclear medicine convened twice in 2000.

Membership advisory platform 'radiology and nuclear medicine':

Drs. J. van Unnik (chairman)
Dr. J. Geleijns (secretary)
N. de Haan
F. Felderhof
Dr.ir. P.H.J. Kicken
Ir. A.H.J. Renders
Prof.dr. J.J. Broerse

Membership advisory platform 'radiotherapy':

Prof.dr. J.J. Broerse (chairman)
Ir. W. de Vries (secretary)
Drs. E.N.J.T. van Lin
F. Cavelaars
Dr. R.W. de Boer
Ir. C.F. Westermann

NCS FINANCIAL OVERVIEW 2000

	Income (NLG)	Costs (NLG)
Savings-account on December 31, 1999	15862.18	
Current-account on December 31, 1999	8591.34	
Cheques and cash on December 31, 1999	389.00	
Contribution Netherlands Society for Radiology*	0.00	
Contribution Netherlands Society for Clinical Physics 2000	225.00	
Contribution Netherlands Society for Radiotherapy and Oncology 2000	1500.00	
Contribution Netherlands Society for Nuclear Medicine 2000	200.00	
Contribution Netherlands Society for Radiological Protection 2000	225.00	
Contribution Netherlands Society for Radiobiology 2000	165.00	
Contribution Netherlands Society for Radiographers and Radiological Technologists 2000	250.00	
Belgian Hospital Physicists Association	109.26	
Interest savings-account	393.33	
Support ZON printing costs NCS report 13	3653.08	
Sales of NCS Reports	445.99	
Costs Chamber of Commerce		0.00
Banking costs		62.33
Costs of board and subcommittees meetings		598.55
Costs web site		434.20
Costs LUMC, TNO, NCS, IRI, NVRB symposium 1999		4980.70
Printing costs NCS report 13		3653.08
Cheques and cash on December 31, 2000		449.00
Savings-account on December 31, 2000		16255.51
Current-account on December 31, 2000		<u>5575.81</u>
Total	<u>32009.18</u>	<u>32009.18</u>

NCS BUDGET 2001

Contributions scientific societies	3675.00	
Interest savings-account	400.00	
Sales of NCS Reports	500.00	
Contributions from others to printing costs of NCS Reports	1650.00	
Costs Chamber of Commerce		75.00
Banking costs		50.00
Costs of board and subcommittees meetings		600.00
Costs web site		500.00
Costs of printing NCS Reports		<u>5000.00</u>
Total	<u>6225.00</u>	<u>6225.00</u>

* The contribution for 2000 was already received in 1999.