PCB questionnaire for 2007, The Netherlands

Reporting date October 20, 2008.

Jack L.M. Venselaar

Ben J. Slotman

Dear colleague,

This 2007 questionnaire was started by a GEC-ESTRO working group under supervision of Prof F. Guedea (Barcelona), member of the executive committee.
The 2007 goal was to update the previous data obtained in a survey on brachytherapy practices in the year 2002. A report of the 2002 data was presented in a paper in the green journal (R&O 82, 2007, 50-54, Guedea et al). The present questionnaire was changed to some extent, in order to be more specific on a number of questions and also to obtain data on a number of specific site-related topics. Some questions from the first questionnaire were not any longer included.

The data collection for the Dutch area was conducted by a national coordinator J. Venselaar, from Instituut Verbeeten, Tilburg (GEC-ESTRO EC member).
The start-up and reporting procedure was done in cooperation with Prof. B. Slotman, Free University, Amsterdam (CVB-NVRO), similar to the procedures used in the previous survey.

The present reporting procedure allows to make comparisons with the 2002 data. Therefore, several columns were added to the histograms in this overview of the results to demonstrate developments.

Reporting is done to the supervisor of the project (to Prof. Guedea, to the GEC-ESTRO executive committee) and a direct feed back is given to all institutions who have contributed to the data collection. This means that a copy of this report is sent to the heads of the RT departments in The Netherlands *and* to the individual experts who acted as our contacts within those departments.

Data in the tables and figures are anonymized. The order of the institutions in the overview is changed with respect to the original listings. A decode is given to each individual institute for their own data.

Out of 21 institutions in The Netherlands, data were received from 20 centres. One institution refused cooperation. When data were received in an incomplete form, a comment is added to the graphs and tables.

October 20, 2008.
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This questionnaire refers to the situation of 2007 (whenever applicable: with status reports valid on 31st December 2007).

Section 1, General information

Note: 21 RT institutions in The Netherlands. 16 million inhabitants. Out of 21 institutions, 20 replies were received (1 refused to participate). RTIL/Maastro is reported as one institution (similar to what was done in the 2002 survey).

1.1 **Type of centre**. Note that you can choose several options to describe the centre.

Private centre □ Academic centre □ Public centre □ Cancer centre □

type of RT centre	
0	private centre
8	university
10	Public centre
5	cancer centre

Note: It was allowed to chose multiple answers. The hospital types are not well defined in the questionnaire, so several of the independent radiotherapy institutions in The Netherlands ticked both "Public centre" and "Cancer centre"; or ticked only "Cancer centre".

1.2 Background of the contact person at the institution. Note that you can choose several options.

Radiation oncologist □ Physicist □ Technologist □ Other □

contact person	
1	radiation oncologist
19	Medical physicist
0	technologist
0	Other

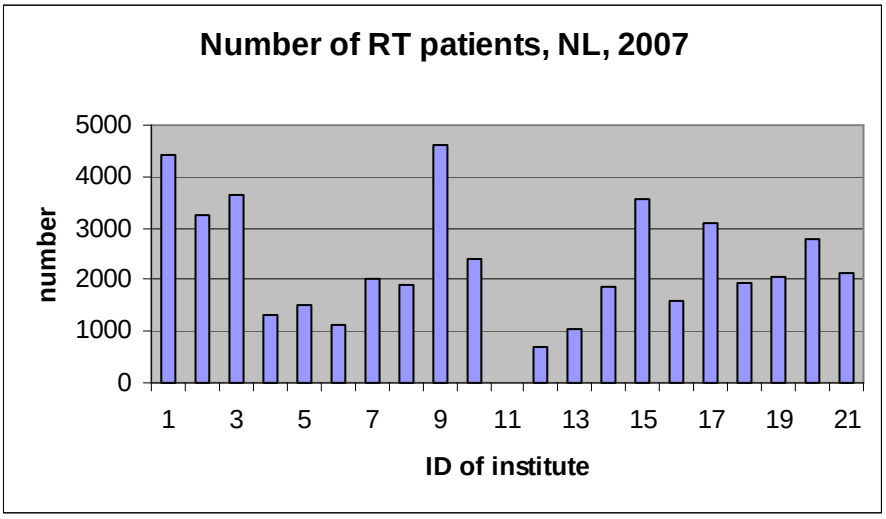
1.3 **Number of radiotherapy patients** treated in 2007:

Radiotherapy patients: A patient can have treatment with external beam and/or brachytherapy. A person is included as **one radiotherapy patient**, even if the treatment is a combination of these two modalities. If a new site is treated within the same (calendar) year, this person is included as **two radiotherapy patients**.

See the histogram below. Totals in tabular form:

Number of (RT) patients treated in 2007			
	2007	2002	ratio (increase) 5 years
total:	46877	41528	1.129
average:	2343.9	1977.5	
Stand.dev	1104	983	

Note: Data in 2007 were obtained from 20 institutions, while the 2002 data were from (all) 21 institutions. The actual ratio is therefore slightly higher.



1.4. **Number of Radiation Oncologists** at the institution (trainees excluded): Results in the table below.

Example:

3 persons working full time = 3 Consultant Radiation Oncologists.

1 person working part time, for example, 3 days/week = 3/5=0.6

Then, the total number of Radiation Oncologists = 3.6

1.5. **Number of Radiation Oncologists in training** at the institution: Results in the table below.

Note: data from question 2.5 on the number of radiation oncologists performing BT is included in this overview.

Staffing levels in 2007			
	Radonc	Trainees	Perform BT
total	195.87	86	87
average	9.8		4.4
standdev	5		2
Staffing levels in 2002			
	Radonc	Trainees	Perform BT
total	152.1	*NA*	83.9

Section 2. Brachytherapy resource information

2.1. **Number of brachytherapy patients** treated in 2007 in the institution:

> **Brachytherapy patients**: A person is included as **one brachytherapy patient**, even if the treatment is combined with external beam therapy. If a new site is treated with brachytherapy within the same year, this person is included as **two brachytherapy patients**.

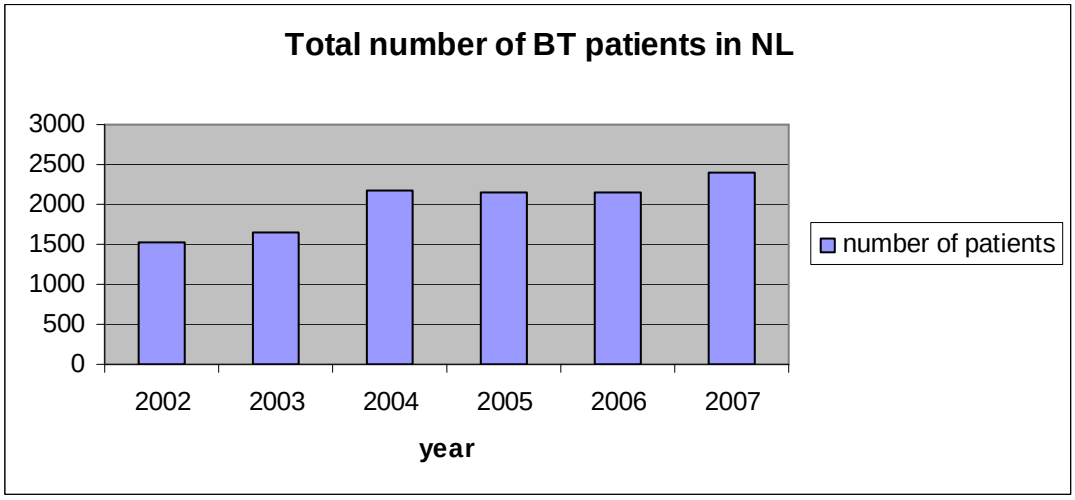
Number of BT patients and applications in 2007				
	BT patients	BT applications		applications/patients
total	2412	3344	Ratio:	1.39
average	120.6	167.2		
standdev	84	118		

Number of BT patients and applications in 2002				
	BT patients	BT applications		applications/patients
total	1987	2460	Ratio:	1.24

Note 1: See the histogram below at item 2.4 for data per institution.

Note 2: The increased ratio of number of applications/number of patients can be explained with an increased use of HDR (increased fractionation). See item 2.5: afterloading equipment.

2.2. **Evolution** of the number of brachytherapy patients at the institution (2002 – 2007):



Note: Answers were not complete in several cases, especially over the first few years. It is not always clear if the institutions that did not provide data for these years had not yet started with BT (i.e. prostate BT, see items 4.5), or just had no numerical data available. Comparison with previous

questionnaire (1987 BT patients in 2002) shows an estimated underreporting of about 450 BT patients in 2002-2003 in this graph.

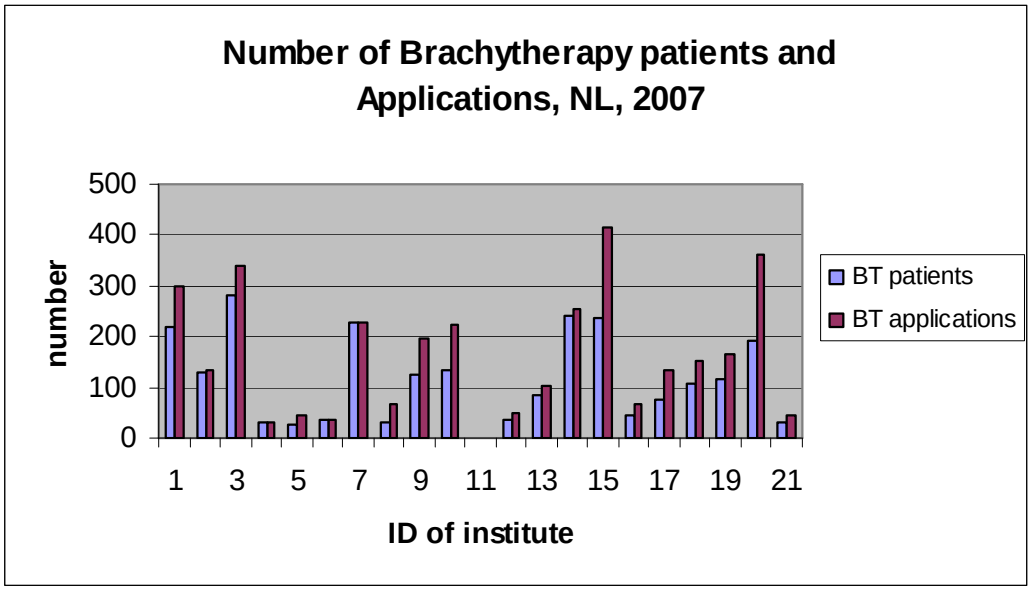
A reasonable conclusion is that the number of BT patients treated in NL is more or less stable or at best only very slightly increasing: the numbers of the previous tables indicate an increased ratio of BT patients in the total of RT patients of 4.8% to 5.1% over the 5 years period.

2.3. **Number of Radiation Oncologists regularly doing brachytherapy** procedures at the institution:

Note: These data are presented at item 1.5.

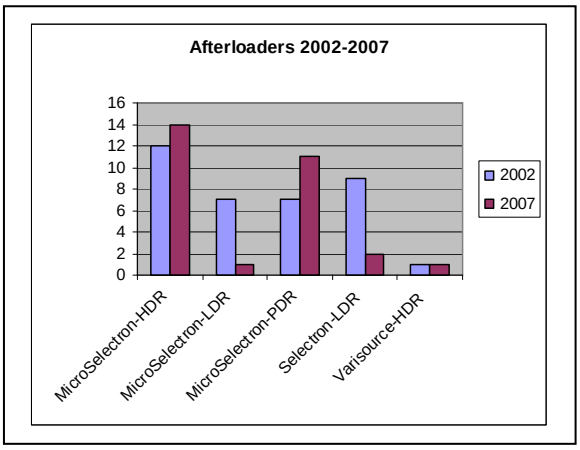
2.4. **Number of brachytherapy applications** performed in 2007 in the institution:

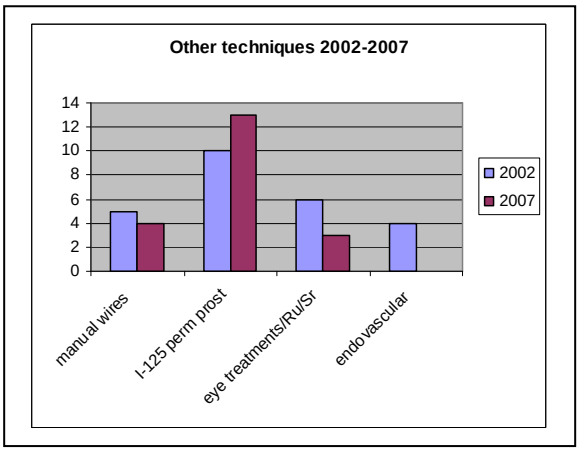
Brachytherapy application: If needles and/or applicators are inserted and this implant is used for several fractions it will be included as one application. If the needles and/or the applicators are removed and inserted several days or weeks later, this is included as two brachytherapy applications.



Note: See the totals in the table at item 2.1.

2.5. **Number of afterloading units** available:





afterloaders	2002	2007
MicroSelectron-HDR	12	14
MicroSelectron-LDR	7	1
MicroSelectron-PDR	7	11
Selectron-LDR	9	2
Varisource-HDR	1	1
total	36	29

other techniques	2002	2007
manual wires	5	4
I-125 perm prost	10	13
eye treatments/Ru/Sr	6	3
endovascular	4	0
total	25	20

Note: A clear shift is observed from LDR techniques (with Cs-137 and Ir-192 sources) in favour of PDR and HDR techniques. Endovascular has not been performed at all in 2007.

Questions 2.6-2.15: Other BT resources available (summarized in the following histogram):

2.6. Special operating room

2.7. Shielded rooms

2.8. Use of plane film

2.9. Use of CT Scan for dosimetry

2.10. Use of Ultrasound

2.11. Use of MRI for dosimetry

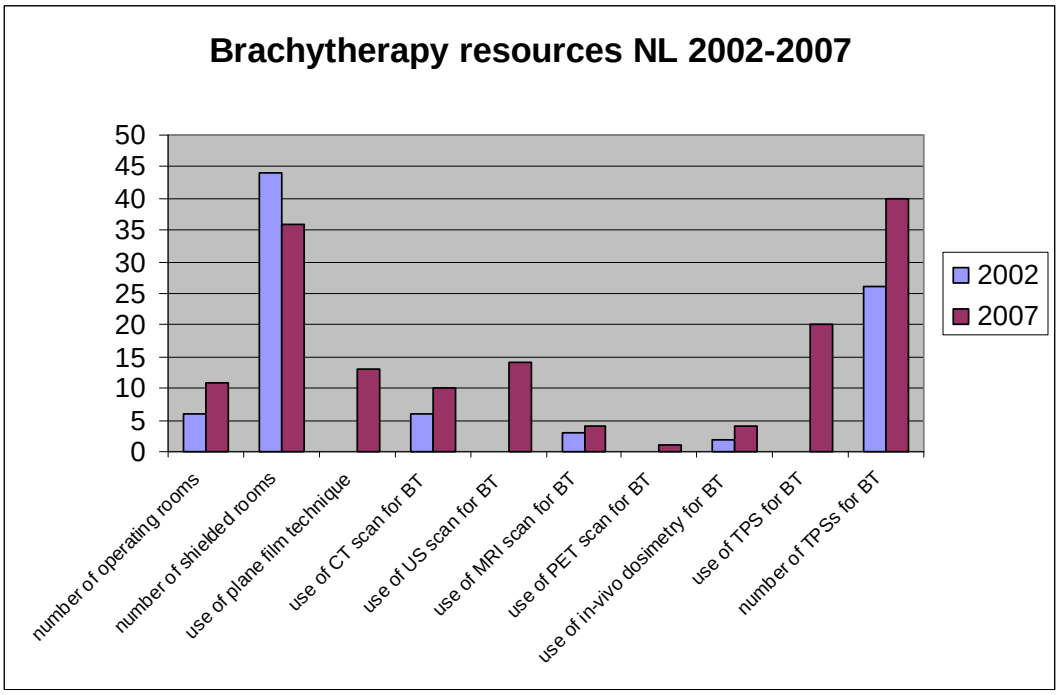
2.12. Use of PET / CT Scan for dosimetry

2.13. Use of in vivo dosimetry

2.14. Use of Treatment Planning Systems (TPS) for BT

2.15. Treatment Planning Systems (TPS) for BT

The answers include the number of types (not workstations) of TPs really used for brachytherapy purposes, not what is available but not in clinical use.



Brachytherapy facilities available in NL 2007	
11	number of operating rooms
36	number of shielded rooms
13	use of plane film technique
10	use of CT scan for BT
14	use of US scan for BT
4	use of MRI scan for BT
1	use of PET scan for BT
4	use of in-vivo dosimetry for BT
20	use of TPS for BT
40	number of TPSs for BT

Note 1: Several questions on resources have not been asked in the previous 2002 survey.

Note 2: The questions on "workload" from the 2002 survey were not repeated.

3 Research and educational programmes

3.1. Is there any brachytherapy clinical trials/research ongoing in the department in 2007?

Research programmes (free text used):
Portec-2 endometrium
RadChoc, Portec-3
RADCHONC
Portec endometrium
Portec-2, Gyn Gec-ESTRO Embrace
prostate, H&N, Gyn, IOBT
MRI based Gynae; MRI based Prostate
Portec-2

Note: This is a YES/NO question with free text for explanation. 8 institutions have replied to this question with these specifications.

3.2. Is there any educational programme ongoing in the institution in 2007:

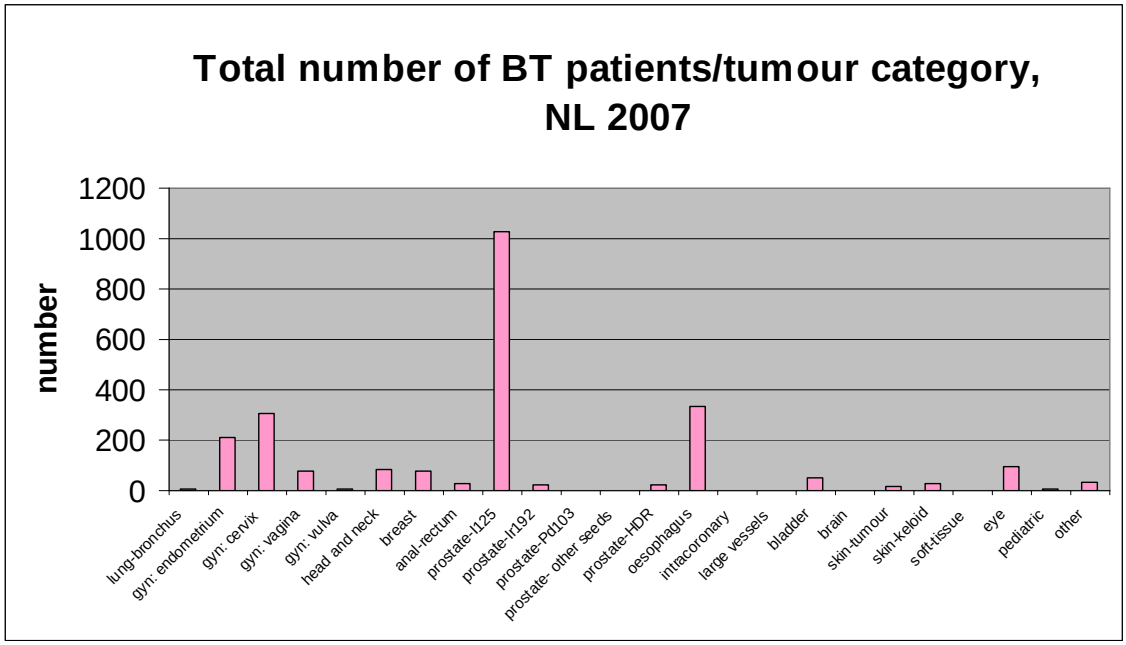
Educational programmes (free text used):
PDR workshop in collaboration with Nucletron
practical training radoncs-in-training xxx Univ
ESTRO brachytherapy course
Edu in frame of GEC-ESTRO GYN workgroup

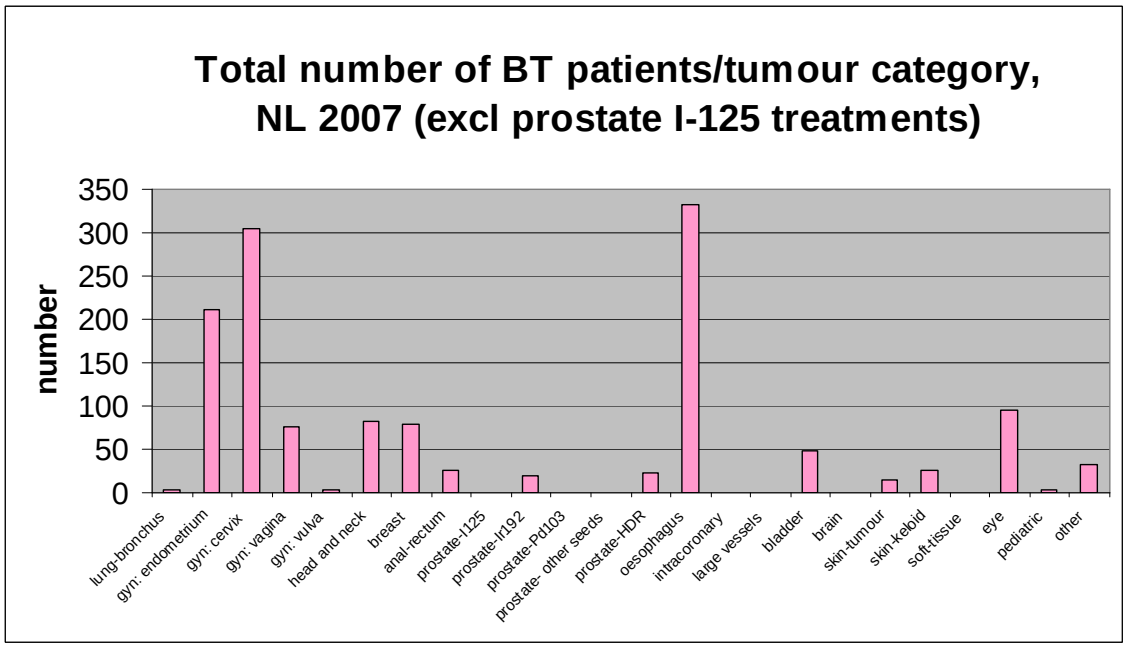
Note: This is a YES/NO question with free text for explanation. 4 institutions have replied to this question with these specifications.

General comment: From the replies to section 3 it becomes clear that the questions leave considerable freedom for interpretation. The replies have hardly any value.

4 Sites treated

4.1. **Total number of patients** treated with brachytherapy in 2007 for the most common sites:





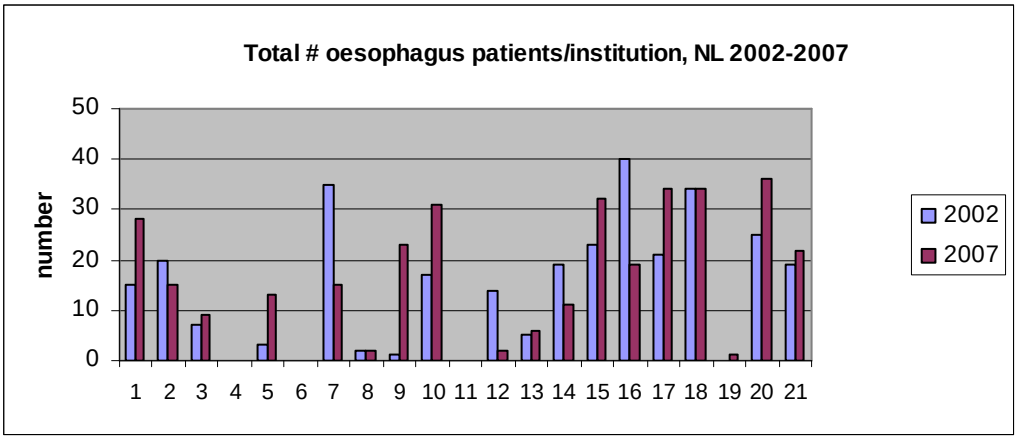
Note: Due to the large number of I-125 prostate implants in the first graph, the presentation of data of other sites becomes unclear. The 2nd graph shows the same data but excluding the I-125 prostate implants, so with different scaling of the Y-axis.

Sites and number of treatments 2007	#	in # of institutions
lung-bronchus	3	2
gyn: endometrium	211	13
gyn: cervix	305	16
gyn: vagina	76	14
gyn: vulva	4	3
head and neck	83	7
breast	79	4
anal-rectum	26	7
prostate-I125	1030	13
prostate-Ir192	20	1
prostate-Pd103	0	0
prostate- other seeds	0	0
prostate-HDR	22	1
oesophagus	333	18
intracoronary	0	0
large vessels	0	0
bladder	49	9
brain	0	0
skin-tumour	14	3
skin-keloid	26	5
soft-tissue	0	0
eye	95	5
pediatric	3	1
other	33	6
totals:	2412	

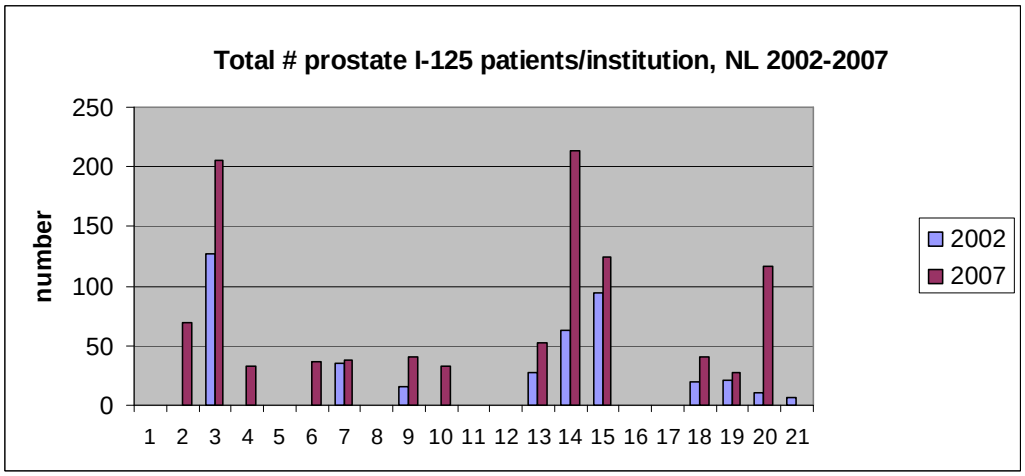
Note: From the previous PCBE report the following data of 2002 were taken for the purpose of comparison.

Sites and number of treatments 2002	total	in # of institutions
bronchus	30	6
gynae (vaginal)	266	18
gynae (intrauterine+vag)	304	17
gynae (other)	16	6
head and neck	79	10
breast	72	5
anal canal/rectum	33	6
prostate I-125	419	10
prostate Ir-192	39	2
prostate Pd-103	0	0
oesophagus	300	17
intracoronary	148	4
large vessels	0	0
bladder	56	14
brain	5	2
skin	44	6
soft tissue	1	1
eye	153	5
other sites	19	6
totals:	1984	

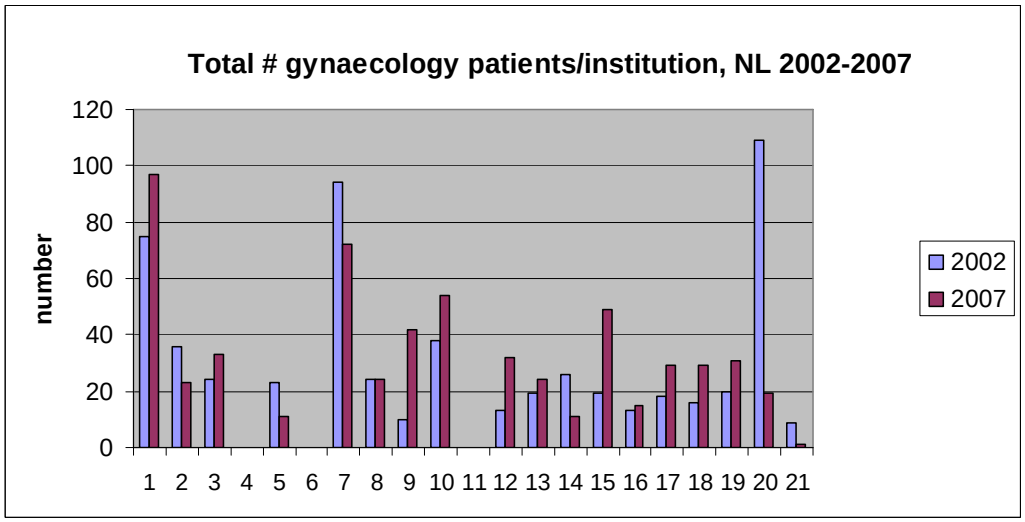
For the 3 most common body sites (“all gynae”, “prostate with I-125 implants” and “oesophagus”) a breakdown is given of the numbers per institution with a comparison of the data of this 2007 PCB report versus the 2002 PCBE data.



The increase of oesophagus patients treated with brachytherapy is 11.1%/5y.



The increase of prostate patients treated with I-125 brachytherapy is 146%/5y.



The increase of gynaecological patients treated with brachytherapy is 1.7%/5y.

4.2. **Lung** brachytherapy:

lung brachy performed in institutions:	2
radical lung patients	2
palliative lung patients	1
total lung patients	3

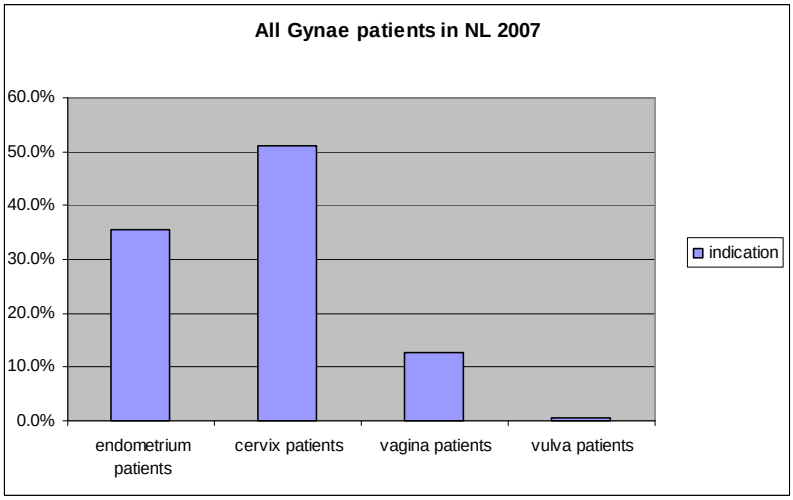
Note: data of lung treatments are included in the table above at item 4.1; only 2 institutions used this technique in 2007.

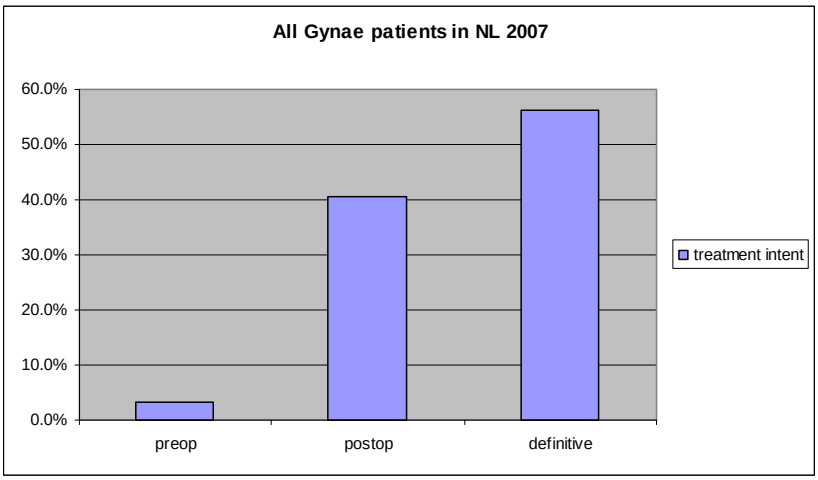
4.3. **Gynaecology** brachytherapy:

4.3.1 **Total number of gynaecology** patients:

treatment intent	Preoperative	Postoperative	Definitive	Total
Endometrium	0	208	3	211
Cervix	11	25	269	305
Vagina	9	8	59	76
Vulva	0	0	4	4
Total	20	241	335	596
in %	3.4%	40.4%	56.2%	100.0%

Totals in % in a graphical form:

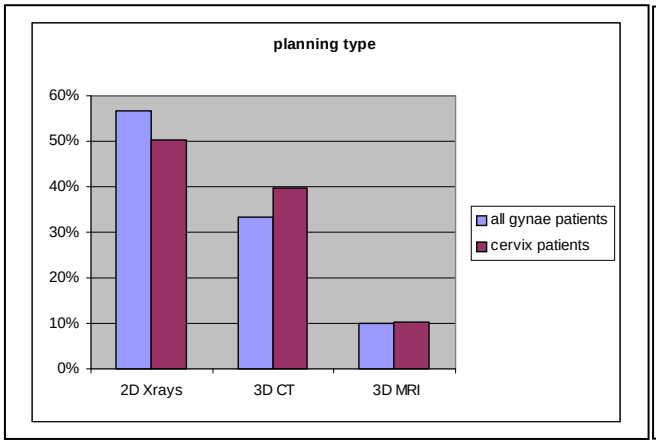


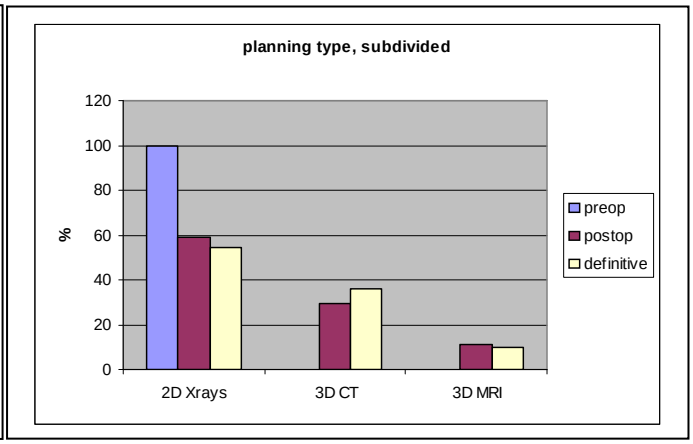


- **Planning type** used in gynaecological BT:

Preoperative			Postoperative			Definitive		
2-D based BT orthogonal X-rays	3-D based BT CT-Scan	3-D based BT MRI	2-D based BT orthogonal X-rays	3-D based BT CT-Scan	3-D based BT MRI	2-D based BT orthogonal X-rays	3-D based BT CT-Scan	3-D based BT MRI

To be specified for endometrium, cervix, vagina, vulva, respectively:





Note: One of the institutions did not provide specified data on the planning procedure.

- In patients with MRI/CT 3-D based brachytherapy, do you **use GYN GEC – ESTRO recommendations**?

References:

Haie-Meder C, et al Radiother Oncol 2005;74:235-245.

Pötter R, et al Radiother Oncol 2006;78:67-77.

Lang S, et al Radiother Oncol 2006;78(2):185-193.

6	Yes for protocols used in Gynae

4.4. **Breast** brachytherapy.

Breast brachy performed in institutions:	4
boost technique	78
PBI	0
thorax wall recurrences	1
total breast patients	79

Note: data of breast treatments are included in the table above at item 4.1; only 4 institutions used this technique in 2007, of which one institution performed 85% (67/79) of the total. All treatments were performed using a multicatheter technique.

4.5. **Prostate** brachytherapy.

prostate treatments performed in 2007 in NL	
1030	I-125 permanent
20	PDR
0	Pd-103
0	other seeds
22	HDR
1072	total

Note: repeated from item 4.1.

4.5.1. **Techniques** for prostate BT: currently used, available or not available at the institution:

Techniques for prostate treatment currently used or available	
robotic surgery	1
conventional XRT	8
Conformal 3D XRT	13
IMRT	11
Cryotherapy	0
HIFU	0
Hormonal treatment only	7
Other	0

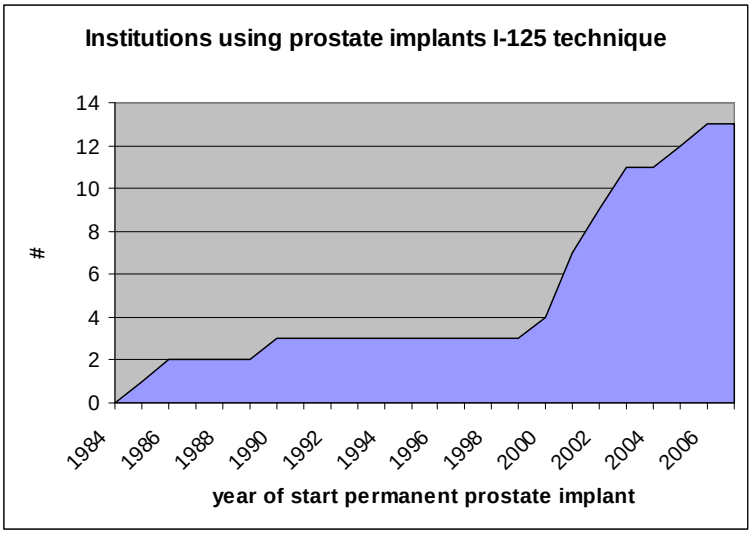
4.5.2. **Selection criteria**, the number of patients according to the TNM staging system:

TNM classification prostate patients		Totals
T1 low risk	40,1%	425
T1 intermediate risk	19,4%	206
T1 high risk	4,2%	44
T2 low risk	13,0%	138
T2 intermediate risk	12,7%	135
T2 high risk	6,5%	69
T3a	1,0%	11
T3b	0,9%	10
Totals	100,0%	1060

Note: totals are different as not all institutions have completed these data.

4.5.3. **Seeds**, permanent implants.

- Prostate brachytherapy with seeds starting year:



- Prescription Dose (in Gy-TG43 dosimetry):

prescription dose (Gy) with I-125 seed treatment to prostate:

	I-125 seed dose	external dose	
combi therapy	110	50	1 inst
	107	45	1 inst
Monotherapy	144		2 inst
	145		9 inst
	160		1 inst

Note: there was no question on other details of the dose prescription (e.g. on use of margins).

- Type of sources:

	Type of sources
10	strictly strands
0	strictly loose seeds
2	strands and loose seeds

- Planning procedure:

	Type of planning procedure
2	preplanning
6	intraoperative planning
9	intraoperative preplanning
11	interactive planning
0	other

4.5.4. **HDR**, temporary implants.

- Prostate brachytherapy with HDR prescription dose:

prescription dose (Gy) with HDR afterloading treatment to prostate

	# of fract	Dose/f HDR	external dose
combi therapy	3	6	45
Monotherapy	4	9,5	0

Note: only 1 institution reported to perform HDR BT on prostate.