



Maastricht UMC+



Vanuit het onderzoekcircuit naar de reguliere patientenzorg

Gezondheidsuniversiteit Verdiept

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 Department of Radiology and Nuclear Medicine
 Division of Medical Imaging and Clinical Laboratories
 Maastricht University Medical Center
 The Netherlands

How the story began...

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... in Maastricht





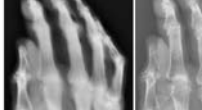
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Marta Armenta, PhD
Jose J. Sanchez, PhD
Michael J. Ragan
Jacobus J. Willems, MS, PhD
Jon A. van Houten, MS, PhD
Gert J. Karama, PhD

Characteristics of a First- Generation X-Ray System¹

Purpose: To compare the anticipated x-ray spectra of the new Ekalit first-generation x-ray system with the spectra of modern dental x-ray systems, it is only feasible prospectively, and technical parameters.

Materials and Methods: The anticipated x-ray spectra consisted of a isotropic, isotropic, and anisotropic. The x-ray spectra were measured, and the spectra of the first-generation were determined. It is shown that Ekalit also can be used for dental x-ray.



¹Figure 1. Images of the hand spectrum of an 80-keV x-ray system obtained with Oribonite tube material (a) and a modern x-ray system (b). In both cases, the image receptor was a modern computed radiography plate. The exposure time with the 80-keV system was 27 minutes, and the distance from the source to the hand was 40 cm. With the modern system we used the following settings: 40 kV, 0.45 mA, 0.010 s. © 1998, J. Ortho. 125: 164, 171, 164, and 171 to follow the hand spectrum and the image.



DL

For geo

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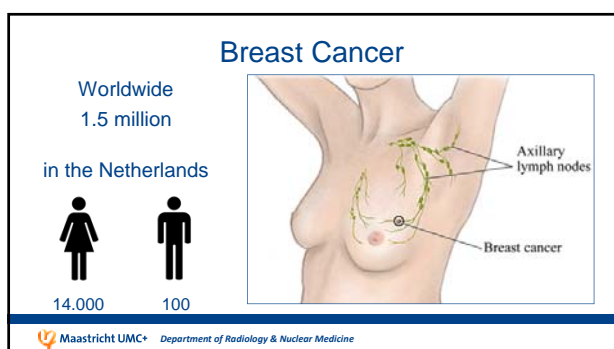
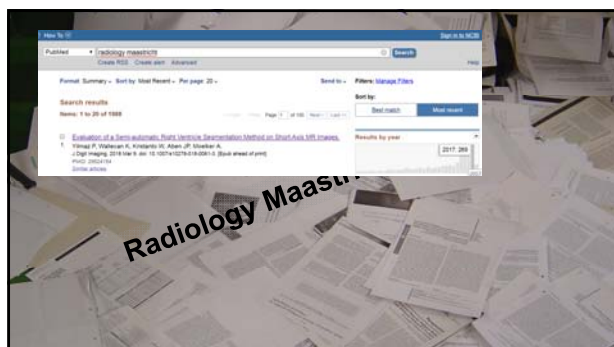
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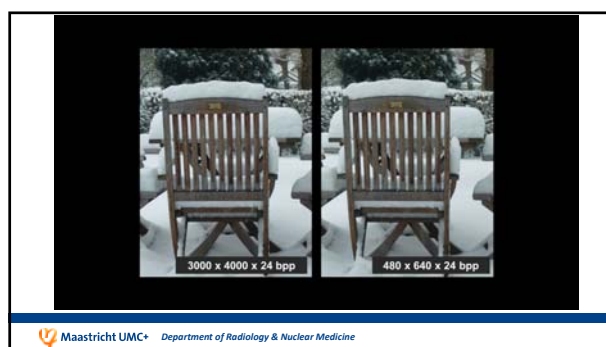
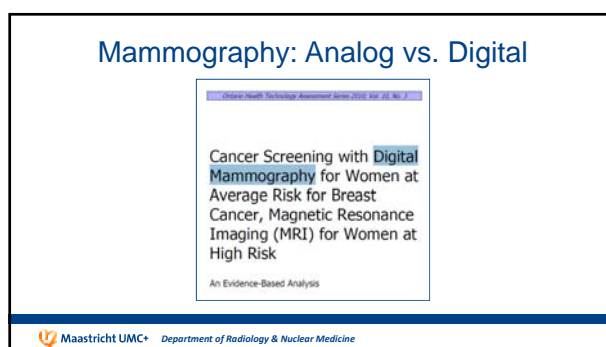
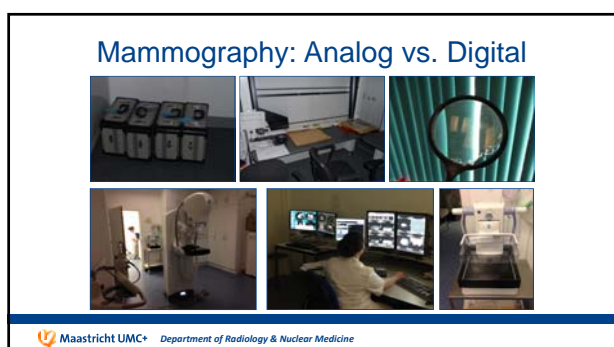
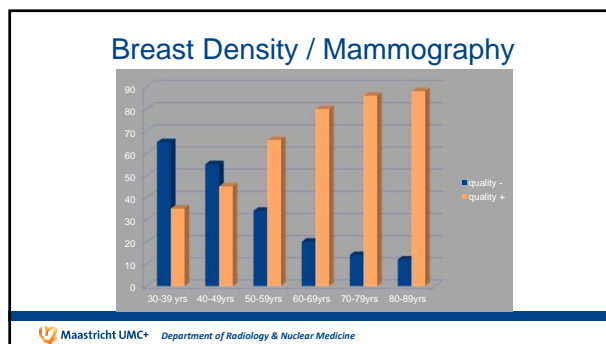
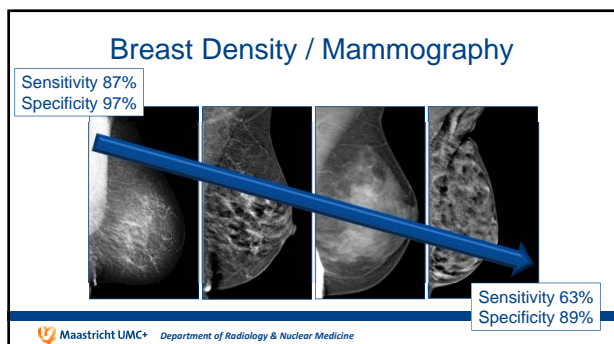


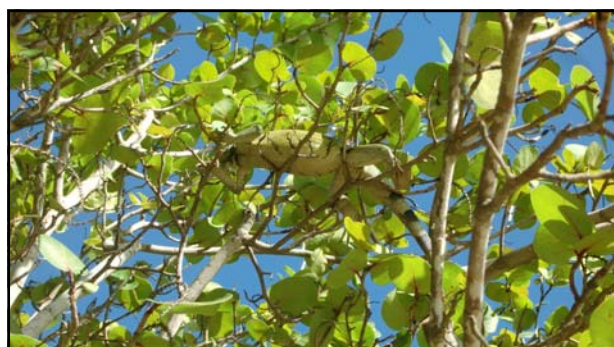
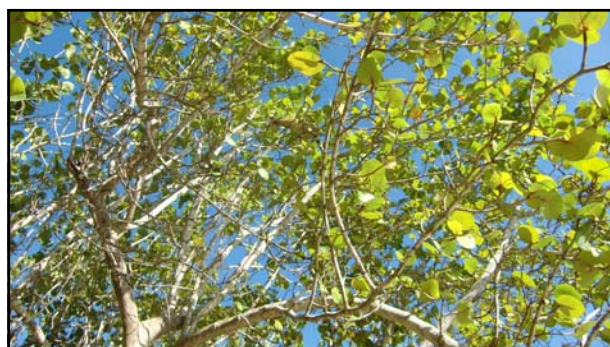
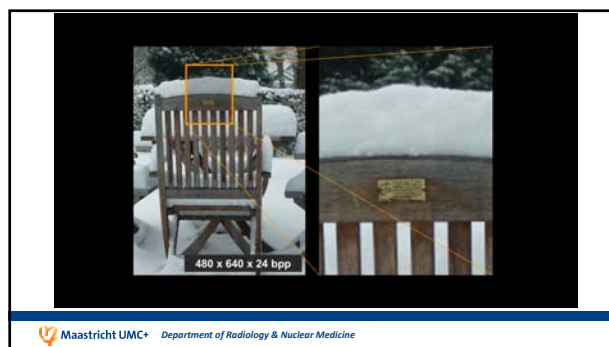
Dutch Screening Program

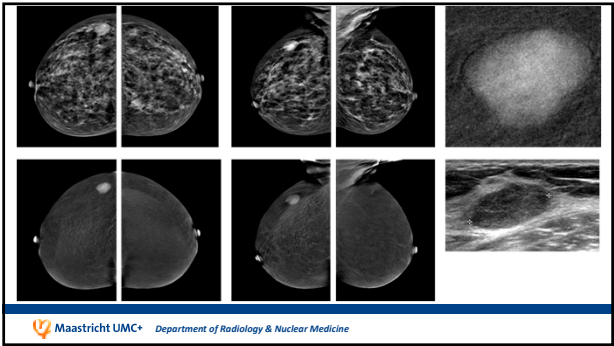
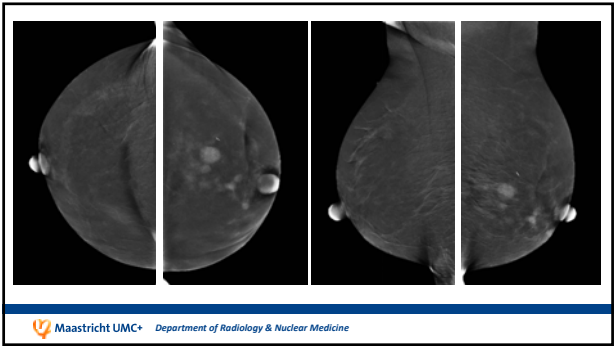
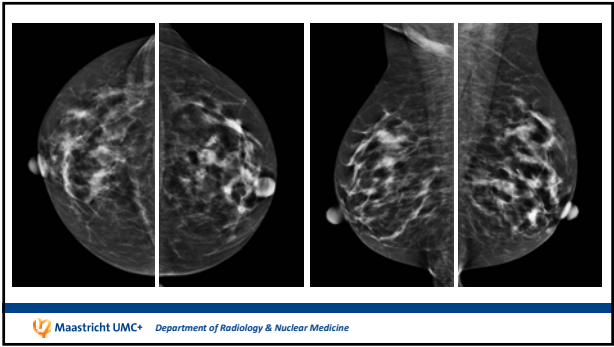
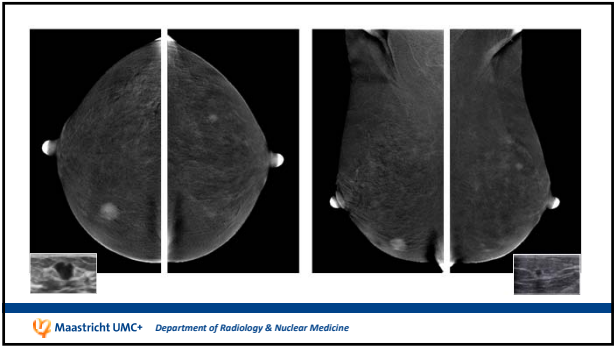
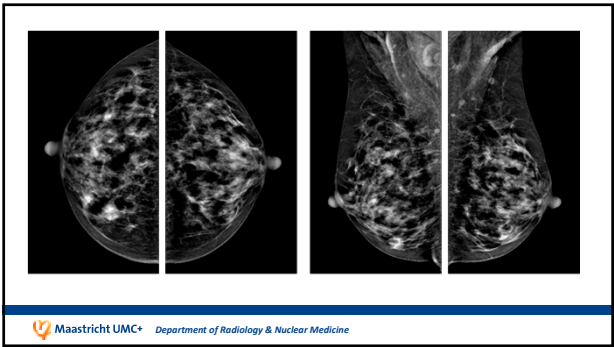
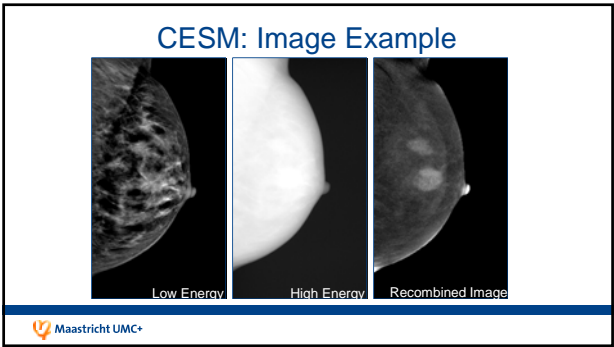
- Introduced in 1989, fully implemented in 1997
- Women age 50-75 years, biannual mammography (MLO, CC)
- Attendance >80%
- Referral rate of approximately 2%
- Disease prevalence in referrals approximately 31%
- Two independent radiologists (third reader for discrepancies)
- With a positive finding, referral to a hospital of choice

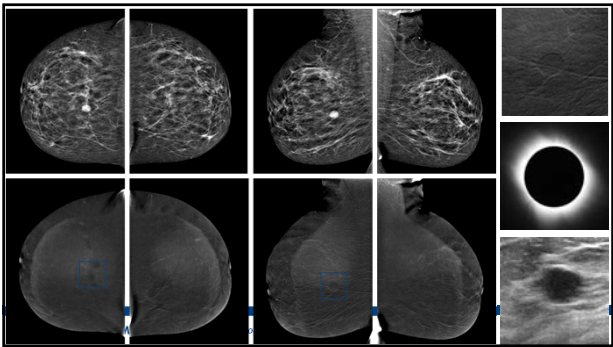
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1963 / 1964

Cornack AM
Representation of a function by its
sinusoidal components. Part I
J Appl Physics
1963, 34: 2722-2727
J Appl Physics
1964, 35: 2908-2913

1970

1972

Nobelpreis für Medizin 1979

...for the development of computer assisted tomography

Allan MacLeod Cormack 1924 - 1998
Sir Geoffrey Rosemary Cormack 1924 - 1998

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1992

1999

2001

2006

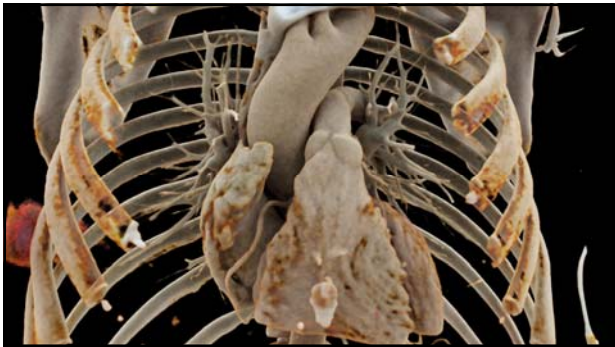
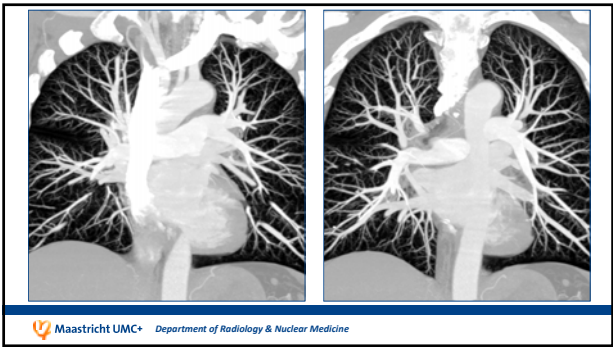
2010

2015

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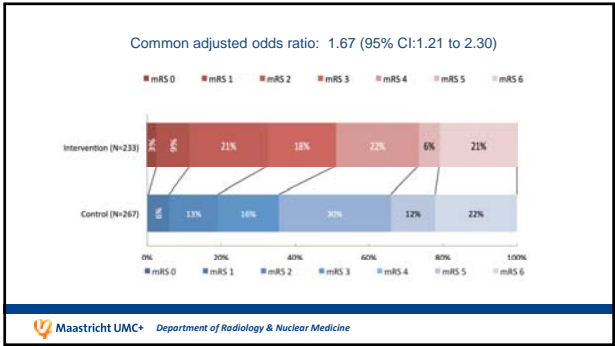
The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 JANUARY 1, 2015 VOL. 372 NO. 1

A Randomized Trial of Intraarterial Treatment for Acute Ischemic Stroke

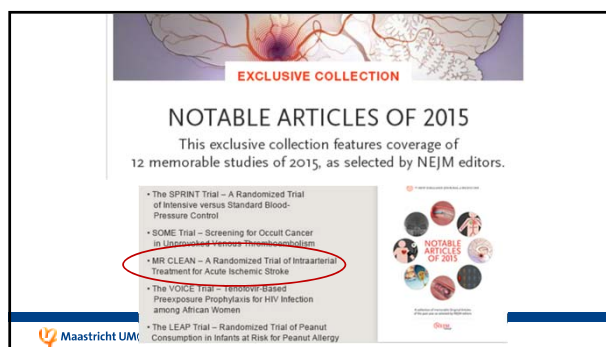
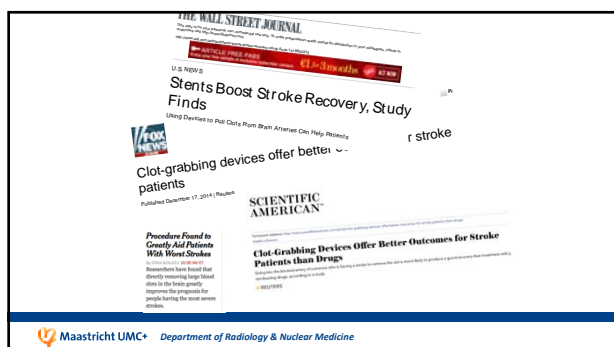
O.A. Berkhemer, P.S.S. Fransen, D. Beumer, L.A. van den Berg, H.F. Lingsma, A.J. Yoo, W.J. Schonewille, J.A. Vos, P.J. Nederkoorn, M.J.H. Werner, M.A.A. van Walderveen, J. Staals, J. Hofmeijer, J.A. van Oostayen, G.J. Lycklama à Nijeholt, J. Boiten, P.A. Brouwer, B.J. Emmer, S.F. de Bruijn, L.C. van Dijk, L.J. Kappelle, R.H. Lo, E.J. van Dijk, J. de Vries, P.L.M. de Kort, W.J.J. van Rooij, J.S.P. van den Berg, B.A.A.M. van Hasselt, L.A.M. Aarden, R.J. Dallinga, M.C. Visser, J.C.J. Bot, P.C. Vroomen, O. Eshghi, T.H.C.M.L. Schreuder, R.J.J. Heijboer, K. Keizer, A.V. Tielbeek, H.M. den Hertog, D.G. Gerrits, R.M. van den Berg-Vos, G.B. Karas, E.W. Steyerberg, H.Z. Flach, H.A. Marquering, M.E.S. Sprengers, S.F.M. Jenniskens, L.F.M. Beenen, R. van den Berg, P.J. Koudstaal, W.H. van Zwam, Y.B.W.E.M. Roos, A. van der Lugt, R.J. van Oostenbrugge, C.B.L.M. Majoie, and D.W.J. Dippel, for the MR CLEAN Investigators*

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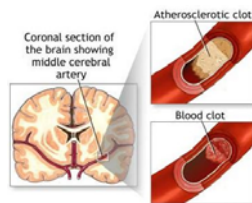
Conclusion

- Intra-arterial treatment in patients with acute ischemic stroke caused by an intracranial arterial anterior circulation occlusion is **effective and safe** within 6 hours from stroke onset.



– In the Netherlands approx **20.000** per year*

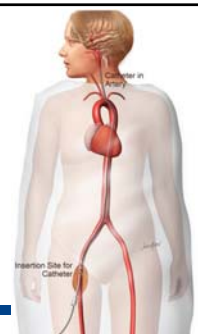
- 20 % hemorrhagic
- 80 % ischemic



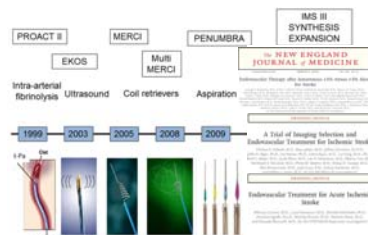
*Vaartjes et al. Stroke 2013

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- Since 1995 IV thrombolytics (NINDS)
 - < 4.5 h after symptom onset
 - Effective in 10% of patients (NNT 7 – 14)
 - Even less effective in large vessel occlusion
- 1999 IA therapy experiments
 - IA thrombolytics
 - Mechanical thrombectomy



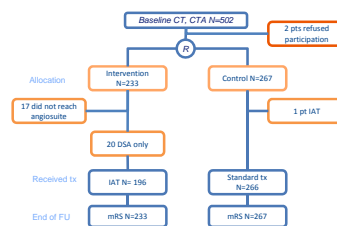
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Techniques for endovascular treatment of acute ischemic stroke: from intra-arterial fibrinolysis to stent-retrievers. Pierot L, Soize S, Benaissa A, Wakhloo AK. Stroke. 2015 Mar;46(3):909-14

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Patient flow in the study



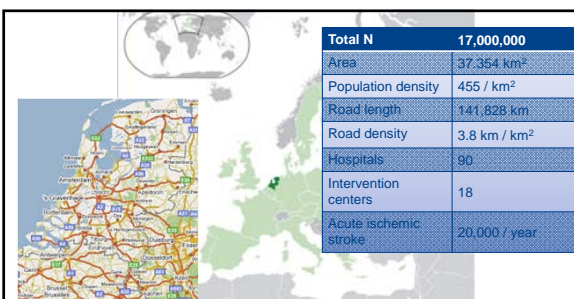
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Why was it so successful

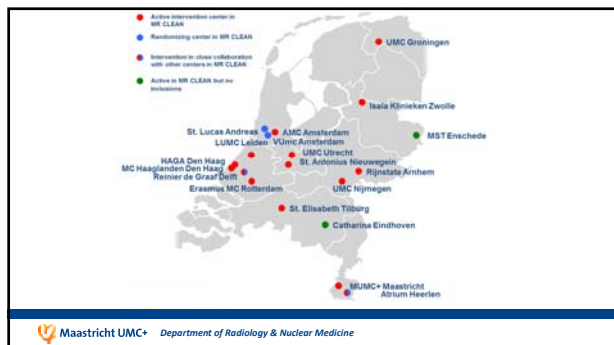
- Right time
- Right place
- Right team



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STAATSCOURANT Nr. 28175 18 september 2014
Officiële uitgave van het Koninkrijk der Nederlanden sinds 1814.

Regeling van de Minister van Volksgezondheid, Welzijn en Sport van 9 september 2014, kenmerk 644674-123776-Z, houdende wijziging van de Regeling zorgverzekering in verband met wijziging van de voorwaarden voor voorwaardelijk toegelaten zorg

De Minister van Volksgezondheid, Welzijn en Sport,
Gelet op artikel 2.1, vijfde lid, van het Besluit zorgverzekering;
Besluit:

ARTIKEL I
Artikel 2.2 van de Regeling zorgverzekering wordt als volgt gewijzigd:

1. Voor de tekst wordt de aanduiding "I" geplaatst.
2. In het eerste lid (nieuw), onderdelen a, b, d en e, wordt "indien de verzekerde deelneemt aan het onderzoek dat door ZonMw wordt gefinancierd" tevens vervangen door "voor zover de verzekerde deelneemt aan onderzoek als bedoeld in het tweede lid na deze zorg".
3. In het eerste lid (nieuw), onderdeel c, wordt na "MR CLEAN" ingevoegd: "of aan observationeel onderzoek als bedoeld in het tweede lid, onderdeel b, na deze zorg".

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Dutch Health Care system

#1 The Netherlands!!!
The Netherlands is the only country which has consistently been among the top three in the total ranking of any European Index the Health Consumer Powerhouse has published since 2005.

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Dutch Health Care system

- The EHCI 2015 total ranking of healthcare systems shows The Netherlands again widening the gap to country #2
- ...could indeed be said to have "the best healthcare system in Europe". There should be a lot to learn from looking deeply into the Dutch progress!
- Ideal environment for nationwide population-based research.

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Why was it so successful

- Right time
- Right place
- Right team

Futura Multicentre Trials

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3 University Hospitals

- Executive Cie: 1 neurologist, 1 interventional radiologist

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Why PET/MRI?

- Compared to CT, MRI can provide additional diagnostic information

The diagram is a table with four columns: Anatomy, Physiology, Metabolism, and Molecular. The rows are CT and MRI. CT has a grey arrow pointing right under Anatomy. MRI has a grey arrow pointing right under Anatomy, a longer grey arrow pointing right under Physiology, and a very long grey arrow pointing right under Metabolism and Molecular. The MRI row is enclosed in a dashed box.

	Anatomy	Physiology	Metabolism	Molecular
CT	→			
MRI	→	→	→	→

Note: The MRI row is highlighted with a dashed border in the original image.

