

CURRICULUM VITAE

Osmo Antti Tervonen

Date of birth: July 1st, 1957,

Degrees

1980, Candidate in Medicine, University of Oulu, Oulu, Finland

1983, Licensiate in Medicine, University of Oulu

1988, Doctorate in Medicine (thesis), Topic: Ultrasound of the Lumbar Intervertebral Disc and Spinal Canal, University of Oulu

1993, Docent in Diagnostic Radiology, University of Oulu

2005, Professor qualification in Radiology, University of Turku, Finland

1983, License to practice medicine,

1989, Specialist in radiology, University of Oulu

Current position:

January 2010 – present: Head and Chief Physician of the Division of Hospital Services (incl Departments of Pathology, Clinical Microbiology, Clinical Neurophysiology, Radiology, Pharmacy, Social therapy, Food service, Logistics, Technical services, Hospital maintenance, Instrument sterilization), Oulu University Hospital
and

January 2006- Professor in Radiology, Oulu University Hospital

Previous positions

Resident positions:

1984-85, Department of Internal Medicine, Paivarinne Hospital, Muhos, Finland

1985-89, Department of Diagnostic Radiology, Oulu University Central Hospital

Specialist positions:

July-Oct 1989, Consultant in Diagnostic Radiology, Oulu University Central Hospital

Oct 1989-December 1990, Assistant professor in Diagnostic Radiology, University of Oulu

June 1991-February 1999, Head of the MRI Department, Oulu University Central Hospital

August 1992-February 1999, Assistant Chief Phycician in Department of Diagnostic Radiology, Oulu University Central Hospital

March 1999-December 2009: Head, Chief Physician, Department of Diagnostic Radiology, Oulu University Central Hospital

February 2006 – December 2009: Head of the Division of Diagnostic Services (incl Departments of Pathology, Clinical Microbiolgy, Clinical Laboratory, Clinical Neurophysiology, Radiology and Pharmacy), Oulu University Hospital

January 2008 – December 2009: Head of the Institute of Diagnostics (incl Departments of Pathology, Clinical Chemistry, Medical Microbiology, Forensic Medicin and Radiology), University of Oulu

Visits abroad:

November 1989 - June 1991, Visiting Scientist, Department of Diagnostic Radiology (under Dr. Richard L. Ehman), Mayo Clinic, Rochester, MN

Academic and professional activities

Scientific administrative positions

- 1992-1994 Secretary General, Radiological Society of Finland
2000-2002 Vice president, Radiological Society of Finland
2002-2004 President, Radiological Society of Finland

Research leaderships and supervised doctoral dissertations

Principal Investigator in start-up of following research groups:

1. Interventional MRI (Current PI Dr Roberto Blanco), 2. Functional MRI of the Brain (Current PI Dr Vesa Kiviniemi) and 3. Low Back Pain Imaging (Current PI Dr Jaakko Niinimäki)

Research funding 2007-2012: Northern Ostrobothnia Hospital District Research -funding 132000 €

Supervised dissertations:

Kerttula Liisa: *Magnetic resonance imaging of the intervertebral disc : post-traumatic findings and the value of diffusion-weighted MR imaging*, University of Oulu, 2001

Ojala Risto: *MR-guided interventions at 0.23T : facilities, user interface, guiding technology and musculoskeletal applications*, University of Oulu, 2002

Blanco Roberto: *Magnetic resonance imaging guided musculoskeletal interventions at 0.23T : optical instrument guidance, bone biopsy, periradicular nerve root therapy, discography, osteoid osteoma laser ablation; a feasibility study*, University of Oulu, 2003

Kurunlahti Mauno: *Association of impaired blood supply with painful lumbar disc degeneration*, University of Oulu, 2003

Kiviniemi Vesa: *Spontaneous blood oxygen fluctuation in awake and sedated brain cortex – a BOLD fMRI study*, University of Oulu, 2004

Mäkiranta Minna: *EEG and BOLD-contrast fMRI in brain : cerebrovascular reactivity, suppression of neuronal activity, global and local brain injury*, University of Oulu, 2004

Autio Reijo: *MRI of herniated nucleus pulposus : correlation with clinical findings, determinants of spontaneous resorption and effects of anti-inflammatory treatments on spontaneous resorption*, University of Oulu, 2006

Ronkainen Johanna: *Costs in today's radiology : aBC analysis of typical situations in the transitional period*, University of Oulu, 2008

Palosaari Kari: *Quantitative and semiquantitative imaging techniques in detecting joint inflammation in patients with rheumatoid arthritis : phase-shift water-fat MRI method for fat suppression at 0.23 T, contrast-enhanced dynamic and static MRI, and quantitative ^{99m}Tc-nanocolloid scintigraphy*, University of Oulu, 2008

Niinimäki Jaakko: *Diffusion-weighted MRI and delayed contrast enhancement of degenerated intervertebral disc*, University of Oulu, 2009

Kokkonen Salla-Maarit: *MRI of intracranial tumours in adults : oedema-attenuated inversion recovery MR sequence in low-field MRI, diffusion-weighted MRI and BOLD fMRI*, University of Oulu, 2009

Kuisma Mari: *Magnetic resonance imaging of lumbar degenerative bone marrow (Modic) changes: determinants, natural course and association with low back pain*, University of Oulu, 2009

Ahvenjärvi Lauri: *Computed tomography in diagnostics and treatment decisions concerning multiple trauma and critically ill patients*, University of Oulu, 2010

Jartti Pekka: *Computed tomography in subarachnoid haemorrhage : studies on aneurysm localization, hydrocephalus and early rebleeding*, University of Oulu, 2010

Reponen Jarmo: *Teleradiology—changing radiological service processes from local to regional, international and mobile environment*, University of Oulu, 2010

Kariniemi Juho: *Magnetic resonance imaging-guided percutaneous abdominal interventions*,
University of Oulu, 2011

Other scientific activities

Reviewer for *Acta Radiologica*, *Journal of Magnetic Resonance Imaging*, *Pediatric Rheumatology*,
Proceedings of National Academy of Sciences

Memberships in academic societies:

Finnish Medical Association

Duodecim

Radiological Society of Finland

Society for Magnetic Resonance in Medicine and Biology

Preliminary examiner or opponent of doctoral dissertations in multiple doctoral thesis in University
of Helsinki, University of Turku, University of Tampere and University of Kuopio

Publications

Veijola, J., Guo, J.Y., Moilanen, J.S., Jääskeläinen, E., Miettunen, J., Kyllönen, M., Haapea, M., Huhtaniska, S.,
Alaräisänen, A., Mäki, P., Kiviniemi, V., Nikkinen, J., Starck, T., Remes, J.J., Tanskanen, P., Tervonen, O., Wink,
A.-M., Kehagia, A., Suckling, J., Kobayashi, H., Barnett, J.H., Barnes, A., Koponen, H.J., Jones, P.B., Isohanni,
M., Murray, G.K.

Longitudinal changes in total brain volume in schizophrenia: Relation to symptom severity, cognition and
antipsychotic medication

(2014) *PLoS ONE*, 9 (7), art. no. e101689, .

Koivisto, K., Kyllönen, E., Haapea, M., Niinimäki, J., Sundqvist, K., Pehkonen, T., Seitsalo, S., Tervonen, O.,
Karppinen, J.

Efficacy of zoledronic acid for chronic low back pain associated with Modic changes in magnetic resonance
imaging

(2014) *BMC Musculoskeletal Disorders*, 15 (1), art. no. 64, .

Hiltunen, T., Kantola, J., Elseoud, A.A., Lepola, P., Suominen, K., Starck, T., Nikkinen, J., Remes, J., Tervonen,
O., Palva, S., Kiviniemi, V., Matias Palva, J.

Infra-slow EEG fluctuations are correlated with resting-state network dynamics in fMRI

(2014) *Journal of Neuroscience*, 34 (2), pp. 356-362.

Abou Elseoud, A., Nissilä, J., Liettu, A., Remes, J., Jokelainen, J., Takala, T., Aunio, A., Starck, T., Nikkinen, J.,
Koponen, H., Zang, Y.-F., Tervonen, O., Timonen, M., Kiviniemi, V.

Altered resting-state activity in seasonal affective disorder

(2014) *Human Brain Mapping*, 35 (1), pp. 161-172.

Kerimaa, P., Ojala, R., Sinikumpu, J.-J., Hyvönen, P., Korhonen, J., Markkanen, P., Tervonen, O., Sequeiros, R.B.
MRI-guided percutaneous retrograde drilling of osteochondritis dissecans of the talus: A feasibility study

(2014) *European Radiology*, 24 (7), pp. 1572-1576.

Kallio-Pulkkinen, S., Haapea, M., Liukkonen, E., Huuomonen, S., Tervonen, O., Nieminen, M.T.

Comparison of consumer grade, tablet and 6MP-displays: Observer performance in detection of anatomical and
pathological structures in panoramic radiographs

(2014) *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology*, 118 (1), pp. 135-141.

Kerimaa, P., Marttila, A., Hyvönen, P., Ojala, R., Lappi-Blanco, E., Tervonen, O., Sequeiros, R.B.

MRI-guided biopsy and fine needle aspiration biopsy (FNAB) in the diagnosis of musculoskeletal lesions

(2013) *European Journal of Radiology*, 82 (12), pp. 2328-2333

Starck, T., Nikkinen, J., Rahko, J., Remes, J., Hurtig, T., Haapsamo, H., Jussila, K., Kuusikko-Gauffin, S., Mattila, M.-L., Jansson-Verkasalo, E., Pauls, D.L., Ebeling, H., Moilanen, I., Tervonen, O., Kiviniemi, V.J.
Resting state fMRI reveals a default mode dissociation between retrosplenial and medial prefrontal subnetworks in ASD despite motion scrubbing
(2013) *Frontiers in Human Neuroscience*, (NOV), .

Toljamo, P.S., Pulkkinen, P., Lammentausta, E., Tervonen, O., Jamsa, T., Nieminen, M.T.
Bone mineral density and geometry parameters determined in vitro from dual-energy digital radiography images in the assessment of bone maximal load of reindeer femora
(2013) *Acta Radiologica*, 54 (8), pp. 961-965.

Oikarinen, H., Karttunen, A., Pääkkö, E., Tervonen, O.
Survey of inappropriate use of magnetic resonance imaging
(2013) *Insights into Imaging*, 4 (5), pp. 729-733.

Remes, J.J., Abou Elseoud, A., Ollila, E., Haapea, M., Starck, T., Nikkinen, J., Tervonen, O., Silven, O.
On applicability of PCA, voxel-wise variance normalization and dimensionality assumptions for sliding temporal window sICA in resting-state fMRI
(2013) *Magnetic Resonance Imaging*, 31 (8), pp. 1338-1348.

Tahvonen, P., Oikarinen, H., Pääkkö, E., Karttunen, A., Blanco Sequeiros, R., Tervonen, O.
Justification of CT examinations in young adults and children can be improved by education, guideline implementation and increased MRI capacity
(2013) *British Journal of Radiology*, 86 (1029), art. no. 20130337, .

Rytty, R., Nikkinen, J., Paavola, L., Abou Elseoud, A., Moilanen, V., Visuri, A., Tervonen, O., Renton, A.E., Traynor, B.J., Kiviniemi, V., Remes, A.M.
GroupICA dual regression analysis of resting state networks in a behavioral variant of frontotemporal dementia
(2013) *Frontiers in Human Neuroscience*, (AUG), art. no. 461,

Akural, E., Ojala, R.O., Järvimäki, V., Kariniemi, J., Tervonen, O.A., Blanco Sequeiros, R.
MR-guided neurolytic celiac plexus ablation: An evaluation of effect and injection spread pattern in cancer patients with celiac tumor infiltration
(2013) *CardioVascular and Interventional Radiology*, 36 (2), pp. 472-478.

Takatalo, J., Karppinen, J., Taimela, S., Niinimäki, J., Laitinen, J., Blanco Sequeiros, R., Paananen, M., Remes, J., Näyhä, S., Tammelin, T., Korpelainen, R., Tervonen, O.
Body mass index is associated with lumbar disc degeneration in young Finnish males: Subsample of Northern Finland birth cohort study 1986
(2013) *BMC Musculoskeletal Disorders*, 14, art. no. 87, .

Takatalo, J., Karppinen, J., Taimela, S., Niinimäki, J., Laitinen, J., Sequeiros, R.B., Samartzis, D., Korpelainen, R., Näyhä, S., Remes, J., Tervonen, O.
Association of Abdominal Obesity with Lumbar Disc Degeneration - A Magnetic Resonance Imaging Study
(2013) *PLoS ONE*, 8 (2), art. no. e56244, .

Junno, J.-A., Paananen, M., Karppinen, J., Tammelin, T., Niinimäki, J., Lammentausta, E., Niskanen, M., Nieminen, M.T., Järvelin, M.-R., Takatalo, J., Tervonen, O., Tuukkanen, J.
Influence of physical activity on vertebral strength during late adolescence
(2013) *Spine Journal*, 13 (2), pp. 184-189

Myllylä, T., Korhonen, V., Vihriälä, E., Sorvoja, H., Hiltunen, T., Tervonen, O., Kiviniemi, V.
Human heart pulse wave responses measured simultaneously at several sensor placements by two MR-compatible fibre optic methods
(2012) *Journal of Sensors*, 2012, art. no. 769613, .

Takatalo, J., Karppinen, J., Niinimäki, J., Taimela, S., Mutanen, P., Sequeiros, R.B., Näyhä, S., Järvelin, M.R., Kyllönen, E., Tervonen, O.
Association of modic changes, Schmorl's nodes, spondylolytic defects, high-intensity zone lesions, disc herniations, and radial tears with low back symptom severity among young Finnish adults.
(2012) *Spine*, 37 (14), pp. 1231-1239

Mankinen, K., Jalovaara, P., Paakki, J.-J., Harila, M., Rytky, S., Tervonen, O., Nikkinen, J., Starck, T., Remes, J., Rantala, H., Kiviniemi, V.

Connectivity disruptions in resting-state functional brain networks in children with temporal lobe epilepsy
(2012) *Epilepsy Research*, 100 (1-2), pp. 168-178

Rahko, J.S., Paakki, J.-J., Starck, T.H., Nikkinen, J., Pauls, D.L., Kätsyri, J.V., Jansson-Verkasalo, E.M., Carter, A.S., Hurtig, T.M., Mattila, M.-L., Jussila, K.K., Remes, J.J., Kuusikko-Gauffin, S.A., Sams, M.E., Bölte, S., Ebeling, H.E., Moilanen, I.K., Tervonen, O., Kiviniemi, V.

Valence scaling of dynamic facial expressions is altered in high-functioning subjects with autism spectrum disorders: An fMRI study
(2012) *Journal of Autism and Developmental Disorders*, 42 (6), pp. 1011-1024.

Toljamo, P.S., Lammentausta, E., Pulkkinen, P., Tervonen, O., Jämsä, T., Nieminen, M.T.

Dual-energy digital radiography in the assessment of bone mechanical properties
(2012) *Physiological Measurement*, 33 (1), pp. 29-37.

Takatalo, J., Karppinen, J., Niinimäki, J., Taimela, S., Mutanen, P., Sequeiros, R.B., Näyhä, S., Järvelin, M.-R., Kyllönen, E., Tervonen, O.

Association of modic changes, schmorl's nodes, spondylolytic defects, high intensity zone lesions, disc herniations, and radial tears with low back symptom severity among young finnish adults
(2011) *Spine*, . Article in Press.

Myllylä, T.S., Sorvoja, H.S.S., Nikkinen, J., Tervonen, O., Kiviniemi, V., Myllylä, R.A.

Instrumentation and method for measuring NIR light absorbed in tissue during MR imaging in medical NIRS measurements
(2011) *Optics InfoBase Conference Papers*, art. no. 80900Y, .

Bode, M.K., Mattila, M.-L., Kiviniemi, V., Rahko, J., Moilanen, I., Ebeling, H., Tervonen, O., Nikkinen, J.

White matter in autism spectrum disorders - Evidence of impaired fiber formation
(2011) *Acta Radiologica*, 52 (10), pp. 1169-1174.

Takatalo, J., Karppinen, J., Niinimäki, J., Taimela, S., Näyhä, S., Mutanen, P., Sequeiros, R.B., Kyllönen, E., Tervonen, O.

Does lumbar disc degeneration on magnetic resonance imaging associate with low back symptom severity in young finnish adults?
(2011) *Spine*, 36 (25), pp. 2180-2189.

Kelempisioti, A., Eskola, P.J., Okuloff, A., Karjalainen, U., Takatalo, J., Daavittila, I., Niinimäki, J., Sequeiros, R.B., Tervonen, O., Solovieva, S., Kao, P.Y.P., Song, Y.-Q., Cheung, K.M.C., Chan, D., Ala-Kokko, L., Järvelin, M.-R., Karppinen, J., Männikkö, M.

Genetic susceptibility of intervertebral disc degeneration among young Finnish adults
(2011) *BMC Medical Genetics*, 12, art. no. 153, .

Paalanne, N., Niinimäki, J., Karppinen, J., Taimela, S., Mutanen, P., Takatalo, J., Korpelainen, R., Tervonen, O.

Assessment of association between low back pain and paraspinal muscle atrophy using opposed-phase magnetic resonance imaging: A population-based study among young adults
(2011) *Spine*, 36 (23), pp. 1961-1968.

Silfverhuth, M.J., Remes, J., Starck, T., Nikkinen, J., Veijola, J., Tervonen, O., Kiviniemi, V.

Directional connectivity of resting state human fMRI data using cascaded ICA-PDC analysis
(2011) *Acta Radiologica*, 52 (9), pp. 1037-1042.

Silfverhuth, M.J., Kortelainen, J., Ruohonen, J., Suominen, K., Niinimäki, J., Sonkajärvi, E., Kiviniemi, V., Alahuhta, S., Jäntti, V., Tervonen, O., Seppänen, T.

A characteristic time sequence of epileptic activity in EEG during dynamic penicillin-induced focal epilepsy - A preliminary study
(2011) *Seizure*, 20 (7), pp. 513-519.

Myllylä, T.S., Sorvoja, H.S.S., Nikkinen, J., Tervonen, O., Kiviniemi, V., Myllylä, R.A.

Instrumentation and method for measuring NIR light absorbed in tissue during MR imaging in medical NIRS

measurements

(2011) *Progress in Biomedical Optics and Imaging - Proceedings of SPIE*, 8090, art. no. 80900Y, .

Elseoud, A.A., Littow, H., Remes, J., Starck, T., Nikkinen, J., Nissilä, J., Timonen, M., Tervonen, O., Kiviniemi, V.

Group-ICA model order highlights patterns of functional brain connectivity

(2011) *Frontiers in Systems Neuroscience*, (JUNE 2011), art. no. 37,

Ojala, R., Kerimaa, P., Lakovaara, M., Hyvönen, P., Lehenkari, P., Tervonen, O., Blanco-Sequeiros, R.

MRI-guided percutaneous retrograde drilling of osteochondritis dissecans of the knee

(2011) *Skeletal Radiology*, 40 (6), pp. 765-770.

Remes, J.J., Starck, T., Nikkinen, J., Ollila, E., Beckmann, C.F., Tervonen, O., Kiviniemi, V., Silven, O.

Effects of repeatability measures on results of fMRI sICA: A study on simulated and real resting-state effects

(2011) *NeuroImage*, 56 (2), pp. 554-569.

Mankinen, K., Long, X.-Y., Paakki, J.-J., Harila, M., Rytty, S., Tervonen, O., Nikkinen, J., Starck, T., Remes, J., Rantala, H., Zang, Y.-F., Kiviniemi, V.

Alterations in regional homogeneity of baseline brain activity in pediatric temporal lobe epilepsy

(2011) *Brain Research*, 1373, pp. 211-220.

Mankinen, K., Long, X.Y., Paakki, J.J., Harila, M., Rytty, S., Tervonen, O., Nikkinen, J., Starck, T., Remes, J., Rantala, H., Zang, Y.F., Kiviniemi, V.

Alterations in regional homogeneity of baseline brain activity in pediatric temporal lobe epilepsy.

(2011) *Brain research*, 1373, pp. 221-229.

Myllylä, T.S., Elseoud, A.A., Sorvoja, H.S.S., Myllylä, R.A., Harja, J.M., Nikkinen, J., Tervonen, O., Kiviniemi, V.

Fibre optic sensor for non-invasive monitoring of blood pressure during MRI scanning

(2011) *Journal of Biophotonics*, 4 (1-2), pp. 98-107.

Junno, J.-A., Paananen, M., Karppinen, J., Tammelin, T., Niinimäki, J., Niskanen, M., Nieminen, M., Kamula, K., Kaakinen, M., Tervonen, O., Tuukkanen, J.

Influence of physical activity on vertebral size

(2011) *Osteoporosis International*, 22 (1), pp. 371-372.

Littow, H., Elseoud, A.A., Haapea, M., Isohanni, M., Moilanen, I., Mankinen, K., Nikkinen, J., Rahko, J., Rantala, H., Remes, J., Starck, T., Tervonen, O., Veijola, J., Beckmann, C., Kiviniemi, V.J.

Age-related differences in functional nodes of the brain cortex-a high model order group ICA study

(2010) *Frontiers in Systems Neuroscience*, 4, art. no. 32, .

Sorvoja, H.S.S., Myllylä, T.S., Kirillin, M.Yu., Sergeeva, E.A., Myllylä, R.A., Elseoud, A.A., Nikkinen, J., Tervonen, O., Kiviniemi, V.

Non-invasive, MRI-compatible fibreoptic device for functional near-IR reflectometry of human brain

(2010) *Quantum Electronics*, 40 (12), pp. 1067-1073.

Jartti, P., Isokangas, J.-M., Karttunen, A., Jartti, A., Haapea, M., Koskelainen, T., Tervonen, O.

Early rebleeding after coiling of ruptured intracranial aneurysms

(2010) *Acta Radiologica*, 51 (9), pp. 1043-1049.

Abou-Elseoud, A., Starck, T., Remes, J., Nikkinen, J., Tervonen, O., Kiviniemi, V.

The effect of model order selection in group PICA

(2010) *Human Brain Mapping*, 31 (8), pp. 1207-1216.

Liukkonen, E., Niinimäki, J., Tervonen, O., Nieminen, M.

Displays at health centers insufficient for radiological diagnostics [Terveyskeskusten työasemanäytöt riittämättömiä röntgendiagnostiikkaan.]

(2010) *Duodecim; lääketieteellinen aikakauskirja*, 126 (6), pp. 650-658.

Harja, J., Myllylä, T.S., Sorvoja, H.S.S., Myllylä, R.A., Elseoud, A.A., Nikkinen, J., Kiviniemi, V., Tervonen, O.
MRI-compatible non-invasive continuous blood pressure measurement using fiber optics
(2010) *Proceedings of SPIE - The International Society for Optical Engineering*, 7547, art. no. 75470F, .

Tahvanainen, P.S., Lammontausta, E., Pulkkinen, P., Tervonen, O., Jms, T., Nieminen, M.T.
Dual-energy digital radiography for the assessment of bone mineral density
(2010) *Acta Radiologica*, 51 (5), pp. 543-548.

Sequeiros, R.B., Kariniemi, J., Ojala, R., Chengli, L., Haapea, M., Sequeiros, A.B., Tervonen, O.
Liver tumor laser ablation increase in the subacute ablation lesion volume detected with post procedural MRI
(2010) *Acta Radiologica*, 51 (5), pp. 505-511.

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Jussila, K., Jansson-Verkasalo, E., Kätsyri, J., Sams, M., Pauls, D., Ebeling, H., Moilanen, I., Tervonen, O.,
Kiviniemi, V.
Functional mapping of dynamic happy and fearful facial expression processing in adolescents
(2010) *Brain Imaging and Behavior*, 4 (2), pp. 164-176.

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Haapsamo, H., Jussila, K., Kuusikko-Gauffin, S., Mattila, M.-L., Zang, Y., Kiviniemi, V.
Alterations in regional homogeneity of resting-state brain activity in autism spectrum disorders
(2010) *Brain Research*, 1321, pp. 169-179.

Starck, T., Remes, J., Nikkinen, J., Tervonen, O., Kiviniemi, V.
Correction of low-frequency physiological noise from the resting state BOLD fMRI-Effect on ICA default mode
analysis at 1.5 T
(2010) *Journal of Neuroscience Methods*, 186 (2), pp. 179-185.

Kiviniemi, V., Starck, T., Remes, J., Long, X., Nikkinen, J., Haapea, M., Veijola, J., Moilanen, I., Isohanni, M.,
Zang, Y.-F., Tervonen, O.
Functional segmentation of the brain cortex using high model order group PICA
(2009) *Human Brain Mapping*, 30 (12), pp. 3865-3886.

Hannila, I., Susanna Räinä, S., Tervonen, O., Ojala, R., Nieminen, M.T.
Topographical variation of T2 relaxation time in the young adult knee cartilage at 1.5 T
(2009) *Osteoarthritis and Cartilage*, 17 (12), pp. 1570-1575.

Kiviniemi, V., Remes, J., Starck, T., Nikkinen, J., Haapea, M., Silven, O., Tervonen, O.
Mapping transient hyperventilation induced alterations with estimates of the multi-scale dynamics of BOLD signal
(2009) *Frontiers in Neuroinformatics*, 3 (JUL), art. no. 18, .

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Kiviniemi, V.
Preoperative localization of the sensorimotor area using independent component analysis of resting-state fMRI
(2009) *Magnetic Resonance Imaging*, 27 (6), pp. 733-740.

Takatalo, J., Karppinen, J., Niinimäki, J., Taimela, S., Näyhä, S., Järvelin, M.-R., Kyllönen, E., Tervonen, O.
Prevalence of degenerative imaging findings in lumbar magnetic resonance imaging among young adults
(2009) *Spine*, 34 (16), pp. 1716-1721.

Niinimäki, J., Korhikoski, A., Ojala, O., Karppinen, J., Ruohonen, J., Haapea, M., Korpelainen, R., Natri, A.,
Tervonen, O.

Association between visual degeneration of intervertebral discs and the apparent diffusion coefficient
(2009) *Magnetic Resonance Imaging*, 27 (5), pp. 641-647.

Niinimäki, J., Korkiakoski, A., Parviainen, O., Haapea, M., Kuisma, M., Ojala, R.O., Karppinen, J., Korpelainen, R., Tervonen, O., Nieminen, M.T.

Association of lumbar artery narrowing, degenerative changes in disc and endplate and apparent diffusion in disc on postcontrast enhancement of lumbar intervertebral disc
(2009) *Magnetic Resonance Materials in Physics, Biology and Medicine*, 22 (2), pp. 101-109.

Korkiakoski, A., Niinimäki, J., Karppinen, J., Korpelainen, R., Haapea, M., Natri, A., Tervonen, O.

Association of lumbARterial stenosis with low back symptoms: A cross-sectional study using two-dimensional time-of-flight magnetic resonance angiography
(2009) *Acta Radiologica*, 50 (1), pp. 48-54.

Kuisma, M., Karppinen, J., Haapea, M., Lammentausta, E., Niinimäki, J., Tervonen, O.

Modic changes in vertebral endplates: A comparison of MR imaging and multislice CT
(2009) *Skeletal Radiology*, 38 (2), pp. 141-147.

Oikarinen, H., Meriläinen, S., Pääkkö, E., Karttunen, A., Nieminen, M.T., Tervonen, O.

Unjustified CT examinations in young patients
(2009) *European Radiology*, 19 (5), pp. 1161-1165.

Kariniemi, J., Sequeiros, R.B., Ojala, R., Tervonen, O.

MRI-guided percutaneous nephrostomy: A feasibility study
(2009) *European Radiology*, 19 (5), pp. 1296-1301.

Jartti, P., Karttunen, A., Isokangas, J.-M., Jartti, A., Koskelainen, T., Tervonen, O.

Chronic hydrocephalus after neurosurgical and endovascular treatment of ruptured intracranial aneurysms
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