On-line Table 1: Search strategy—EMBASE 1988 to 2014 Week 16

No.	Searches	Results	Search Type
1	Spinal diseases/or intervertebral disk degeneration/or intervertebral disk displacement/ or exp spondylolysis/	22,247	Advanced
2	Lumbar vertebrae/or zygapophyseal joint/	11,470	Advanced
3	Osteoarthritis/or osteoarthritis, spine/	48,654	Advanced
4	Osteoarthritis/and (2 or exp spinal diseases/)	2766	Advanced
5	Diagnostic imaging/or exp magnetic resonance imaging/or exp radiography/or exp radionuclide imaging/or exp tomography/or exp ultrasonography/	1,727,168	Advanced
6	Exp spine disease/and exp degenerative disease/	8885	Advanced
7	Low back pain/	32,683	Advanced
8	Or/1–4,6–7	108,803	Advanced
9	8 and modic.mp. [mp = title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	243	Advanced
10	5 and 8	31,092	Advanced
11	9 or 10	31,135	Advanced
12	Asymptomatic disease/or asymptomatic.mp.	124,137	Advanced
13	11 and 12	1022	Advanced
14	Comparative study/or cross-sectional study/or case control study/or cohort*.mp. or prospective*.mp. or retrospective*.mp. [mp = title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	1,967,431	Advanced
15	13 and 14	296	Advanced
16	Limit 15 to human	278	Advanced
17	Remove duplicates from 16	276	
18	(vertebral or spin*) adj2 (endplate or "end-plate").mp. [mp = title, abstract, subject headings, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword]	493	Advanced
19	14 and 18	115	Advanced
20	5 and 19	85	

Note:—exp indicates explosion search; mp, multipurpose; adj2, adjective 2.

On-line Table 2: Search strategy—Ovid MEDLINE In-Process and other nonindexed citations and Ovid MEDLINE 1946 to Present

No.	Searches	Results	Search Type
1	Spinal diseases/or intervertebral disk degeneration/or intervertebral disk displacement/or exp spondylolysis/	34,995	Advanced
2	Low back pain/or osteoarthritis, spine.mp. or (spinal diseases/and osteoarthritis/) [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	14,254	Advanced
3	Exp diagnostic imaging/and (1 or 2)	11,581	Advanced
4	3 and asymptomatic*.mp. [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	380	Advanced
5	(Modic or [(vertebral or spin*) adj2 (endplate* or "end-plate*")]).mp. [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	880	Advanced
6	5 and asymptomatic*.mp. [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	22	Advanced
7	4 or 6	390	Advanced
8	7 and (incidence or prevalence or frequency).mp. [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	99	Advanced
9	7 and (comparative study/or cross-sectional study/or cohort*.mp. or prospective*.mp. or retrospective*.mp. or "case-control*".mp.) [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	146	Advanced
10	8 or 9	195	
11	[(lumbar or spinal or spine or vertebral) and (osteoarthritis or degenerat* or spondyl* or arthropath* or herniat*)].mp. [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	41,194	Advanced
12	11 and asymptomatic*.mp. [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	795	Advanced
13	12 and (mri or imag* or "magnetic resonance" or radiogra*).mp. [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	519	Advanced
14	13 and (compar* or "cross-section*" or "case control*" or cohort*).mp. [mp = title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier]	211	Advanced
15	10 or 14	340	Advanced
16	Remove duplicates from 15	334	Advanced
17	10 or 15	340	

Note:—exp indicates explosion search; mp, multipurpose; adj2, adjective 2.

On-line Table 3: Summary of articles included in the systematic review

Author, Year	No. of Subjects	Age Range (yr)	Patient Characteristics	Imaging Modality	Degenerative Findings Reported
Boden et al, 1990[5]	67	20–80	Volunteers	MRI	Disk degeneration, disk bulge
Boden et al, 1996[27]	67	20–79	Volunteers	MRI	Annular fissure
Boos et al, 1995[28]	46	20–50	Volunteers	MRI	Disk degeneration, disk protrusion
Capel et al, 2009[29]	60	18–31	Volunteer female dancers	MRI	Disk degeneration
Carragee et al, 2006[4]	200	22–57	Volunteers	MRI	Disk degeneration, disk protrusion, annular fissure, facet degeneration
Danielson and Willen, 2001[30]	43	20–60	Volunteers	MRI	Disk degeneration, disk protrusion
Dora et al, 2002[31]	46	20–50	Volunteers	MRI	Disk protrusion
Edmondston et al, 2000[32]	10	30 ± 5.8[a]	Volunteers	MRI	Disk degeneration, disk protrusion
Erkintalo et al, 1995[33]	31	18	Volunteers	MRI	Disk degeneration, disk height loss, disk protrusion
Feng et al, 2000[34]	73	29–56	Volunteers	CT	Disk protrusion
Gibson et al, 1987[35]	20	14–19	Volunteers	MRI	Disk protrusion
Greenberg et al, 1991[20]	64	20–60	Volunteers	MRI	Disk degeneration, disk bulge, disk protrusion
Hamanishi et al, 1994[36]	81	20–80	Imaged for nonlumbar spine pathologies	MRI	Schmorl nodes
Healy et al, 1996[37]	19	41–69	Volunteer adult male athletes	MRI	Disk bulge
Jarvik et al, 2001[22]	148	35–70	Volunteers	MRI	Disk degeneration, disk signal loss, disk height loss, disk bulge, disk protrusion, annular fissure, facet degeneration, spondylolisthesis
Jensen et al, 1994[38]	98	20–80	Volunteers	MRI	Disk bulge, disk protrusion
Kalichman et al, 2010[6]	150	40–80	Cross-sectional sample of Framingham Heart Study participants	CT	Disk height loss, facet degeneration
Kanayama et al, 2009[39]	200	30–55	Volunteers	MRI	Disk degeneration, disk protrusion
Karakida et al, 2003[40]	18	23–56	Volunteers	MRI	Disk degeneration
Kjaer et al, 2005[41]	412	40	Volunteers	MRI	Disk degeneration, disk signal loss, disk height loss, disk protrusion, annular fissure, facet degeneration
Kovacs et al, 2014[42]	64	41–47	Volunteers	MRI	Disk degeneration, disk protrusion, spondylolisthesis
Matsumoto et al, 2013[43]	94	48 ± 13.4[a]	Volunteers	MRI	Disk signal loss, disk height loss, disk protrusion
Paajanen et al, 1997[44]	216	10–49	Volunteers	MRI	Disk degeneration
Paajanen et al, 1989[45]	34	20	Volunteers	MRI	Disk degeneration
Ranson et al, 2005[46]	53	25 ± 5[a]	Volunteer cricket players	MRI	Disk degeneration, disk signal loss
Savage et al, 1997[47]	149	45–62	Cross-sectional study of male workers	MRI	Disk degeneration, disk protrusion, facet degeneration
Silcox et al, 1995[48]	8	30–40	Volunteers	MRI	Disk signal loss, disk height loss, disk bulge
Stadnik et al, 1998[49]	36	20–45	Volunteers	MRI	Disk bulge, disk protrusion, annular fissure
Szypryt et al, 1989[50]	20	15–45	Volunteers	MRI	Disk degeneration
Takatalo et al, 2012[11]	167	20–23	Volunteers from birth cohort study	MRI	Annular fissure
Weinreb et al, 1989[51]	41	20–39	Asymptomatic nonpregnant female volunteers	MRI	Disk bulge
Weishaupt et al, 1998 [52]	60	20–50	Volunteers	MRI	Disk signal loss, disk bulge, disk protrusion
Zobel et al, 2012[53]	315	19–25	Volunteers	MRI	Disk degeneration

[a] Age range not available. Reported as mean ± SD.