Supplementary Table 4: Methodological quality of included studies

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Item** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |  |  |
|  | **Sample method** | **Sampling frame** | **Adequate sample size** | **Measurement** | **Unbiased measurement** | **Response rate** | **Estimates/subgroups** | **Study subjects** | **Total score** | **Normalized score (0-2)** |
| **Radiography Studies** |  |  |  |  |  |  |  |  |  |  |
| Ahn 2012 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 4 | 1 |
| Arfaj 2002 | 1 | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 6 | 1.5 |
| Baker Xu 2004 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 5 | 1.25 |
| Barenius 2014 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 5 | 1.25 |
| Barret 1990 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 2 | 0.5 |
| Bennett 2007 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 4 | 1 |
| Bourke 2012 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0.5 |
| Braga 2009 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 5 | 1.25 |
| Chan 1991\* | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.25 |
| Cho 2016 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 6 | 1.5 |
| Cicuttini 1997 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 5 | 1.25 |
| Cicuttini 2002 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 5 | 1.25 |
| Cohen 2007 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0.5 |
| Cooper 1994 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Culvenor 2014 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 3 | 0.75 |
| Davies 2002 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0.5 |
| Duncan 2006 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 4 | 1 |
| Elahi 2000 | 0 | 1 | 0 | 1 | 0 | 1 | 0 | 1 | 4 | 1 |
| Englund 2005 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 5 | 1.25 |
| Ersoz 2003 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0.5 |
| Eti 1998 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0.25 |
| Farrokhi 2013 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 4 | 1 |
| Glass 2014 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 6 | 1.5 |
| Gross 2012ⱡ | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 1 |
| Hertel 2005 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0.5 |
| Hinman 2002 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 4 | 1 |
| Hinman 2014 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 6 | 1.5 |
| Huang 2000 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 5 | 1.25 |
| Hulet 2015 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 3 | 0.75 |
| Hunter Niu 2005 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 5 | 1.25 |
| Hunter Zhang 2007 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 6 | 1.5 |
| Jarvela 2001 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 2 | 0.5 |
| Jones 1993 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0.5 |
| Keays 2007 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 0.5 |
| Kerna 2013 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 5 | 1.25 |
| Kujala 1995 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 5 | 1.25 |
| Kumm 2012 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 4 | 1 |
| Lacey 2008 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 6 | 1.5 |
| Lanyon 1998 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 1 |
| Ledingham 1993 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 2 | 0.5 |
| Li 2011 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0.5 |
| Liden 2008 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0.5 |
| Lohmander 2004 | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 5 | 1.25 |
| McAlindon 1992 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 3 | 0.75 |
| **Item** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |  |  |
|  | **Sample method** | **Sampling frame** | **Adequate sample size** | **Measurement** | **Unbiased measurement** | **Response rate** | **Estimates/subgroups** | **Study subjects** | **Total score** | **Normalized score (0-2)** |
| McAlindon 1996 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 4 | 1 |
| Messier 2005 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 3 | 0.75 |
| Murray 2012 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Naredo 2005 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 4 | 1 |
| Neame 2004 | 0 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 5 | 1.25 |
| Neuman 2009 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 4 | 1 |
| Oiestad 2013 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 4 | 1 |
| Roth 1985 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Rytter 2009 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 6 | 1.5 |
| Sadat Ali 1996 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0.25 |
| Sajovic 2006 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0.5 |
| Salmon 2006 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0.25 |
| Spector 1996 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 4 | 1 |
| Sward 2013 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 1 |
| Szebenyi 2006 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 3 | 0.75 |
| Szoeke 2006 | 1 | 1 | 0 | 0 | 1 | 0 | 1 | 1 | 5 | 1.25 |
| Tangtrakulwanich 2006 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 6 | 1.5 |
| Thorstensson 2009 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 3 | 0.75 |
| Van der Esch 2014 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 1 |
| **MRI Studies** |  |  |  |  |  |  |  |  |  |  |
| Amin Guermazi 2008 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 6 | 1.5 |
| Amin Goggins 2008 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 6 | 1.5 |
| Amin Baker 2009 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 2 |
| Cai 2015 | 0 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | 4 | 1 |
| Crema 2014 | 1 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 6 | 1.5 |
| Culvenor 2015 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 1 |
| Ding Cicuttini 2005 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 4 | 1 |
| Gross 2011 | 1 | 1 | 0 | 1 | 0 | 0 | 1 | 1 | 5 | 1.25 |
| Hayes 2005 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 1 | 4 | 1 |
| Kornaat 2005 | 0 | 1 | 0 | 1 | 1 | 0 | 1 | 1 | 5 | 1.25 |
| Peterfy 2004 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | 3 | 0.75 |
| Runhaar 2014 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 1 | 4 | 1 |
| Sowers 2011 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 4 | 1 |
| Teng 2015 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0.5 |
| Tsavalas 2012 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 0.5 |
| Van Meer 2016 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 1 |
| Wang 2012 | 0 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 6 | 1.5 |
| Wang 2015 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 6 | 1.5 |
| Stefanik Niu 2013 | 1 | 1 | 0 | 1 | 0 | 1 | 1 | 1 | 6 | 1.5 |
| Stefanik Gross 2015 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 1 | 3 | 0.75 |
| Stefanik Gross 2015 (ACR) | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2 | 0.5 |
| Sharma 2014  | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 5 | 1.25 |

Note. Abbreviations as follows: MRI, magnetic resonance imaging. \*symbol denotes to studies included in radiography and MRI analyses. ⱡsymbol denotes to studies included in radiography and MRI analyses. Normalized score of ≥1.4 indicates high methodological quality (shaded dark grey), 1.1 to 1.4 moderate methodological quality (shaded light grey) and <1.1 low methodological quality