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| --- | --- | --- |
| **First author, year of the study** |  | **Quality of the studies (GRADE Scale)** |
| **Design** | **Risk of Bias** | **Consistency** | **Directness** | **Precision** | **Publication bias** | **Effect** | **Dose-Response** | **Residual confounding** |
| Hannan et al, 1994 (1) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Small (some statistically significant) | Minimal | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Dziuban et al, 1994 (2) | **Characteristic** | Observational study | Minimal | Consistent | Indirect | Precise | Not likely | Small | Not shown | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Rosenthal et al, 1997 (3) | **Characteristic** | Observational study | Minimal | Consistent | Indirect | Precise | Not likely | Small (some statistically significant) | Not shown | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Peterson et al, 1998 (4) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Small (some statistically significant) | Small | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | Increase | No change | No change |
| Chassin, 2002 (5) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Moderate | Small | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | Increase | No change | No change |
| Clough et al, 2002 (6) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Small | Very minimal | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Baker et al, 2002 (7) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Small (few statistically significant) | None | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Baker et al, 2003 (8) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Small (few statistically significant) | Small  | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Dranove et al, 2003 (9) | **Characteristic** | Observational study | Minimal | Consistent (inconsistencies explained) | Direct | Precise | Not likely | Small | Moderate | Some potential |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | Increase | No change |
| Moscucci et al, 2005 (10) | **Characteristic** | Observational study | Multiple sources identified | Consistent | Direct | Precise | Not likely | Some statistically significant | Not shown | Potential to increase or decrease |
| **Effect on quality** | Low | Decrease | No change | No change | No change | No change | Increase | No change | No change |
| Carey et al., 2006 (11) | **Characteristic** | Observational study | Minimal | consistent | Direct | Precise | Not likely | Small | Association suggested | None |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | Increase | No change |
| Guru et al, 2006 (12) | **Characteristic** | Observational study | Minimal | consistent | Direct | Precise | Not likely | Small | Nearly none | Minimal |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Jha et al, 2006 (13) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Slightly less precise (small numbers) | Not likely | Small | Not significant | Potential to increase or decrease |
| **Effect on quality** | Low | No change | No change | No change | Decrease | No change | No change | Increase | No change |
| Hollenbeak et al, 2008 (14) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Small | Small | Potential to increase or decrease |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | Increase | No change |
| Ryan, 2009 (15) | **Characteristic** | Observational study | Small potential | Consistent | Direct | Slightly less precise (limited amount of patient/hospital data) | Not likely | None | None | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | Decrease | No change | No change | No change | No change |
| Friedberg et al, 2009 (16) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | very minimal | Nearly none | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Werner et al, 2010 (17) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Small (Modest) | Not significant | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Li et al, 2010 (18) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Moderate | Some statistically significant | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | Increase | No change | No change |
| Jha et al, 2012 (19) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | None | None found | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Joynt et al, 2012 (20) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Moderate | Significant association indicated | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | Increase | No change | No change |
| Renzi et al, 2012 (21) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Some statistically significant | Association suggested | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | Increase | No change | No change |
| Ryan et al, 2012 (22) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | very small | None | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Linkin et al, 2013 (23) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | None | Not shown | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| McCabe et al, 2013 (24) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | Small (some statistically significant) | very small | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Marsteller et al, 2014 (25) | **Characteristic** | Observational study | Minimal | Consistent | Direct | Precise | Not likely | small | small | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | No change | No change | No change |
| Yang et al, 2014 (26) | **Characteristic** | Experimental study | Minimal | Consistent | Direct | Precise | Not likely | Small (few statistically significant) | Small | Potential to increase or decrease effect |
| **Effect on quality** | High | No change | No change | No change | No change | No change | Increase | No change | No change |
| Wang et al, 2014 (27) | **Characteristic** | Observational study | Minimal | Consistent (possible inconsistencies accounted for) | Direct | Precise | Not likely | Moderate | Some statistically significant | Potential to increase or decrease effect |
| **Effect on quality** | Low | No change | No change | No change | No change | No change | Increase | No change | No change |

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