| Section and Topic | Item # | Checklist item                                                                                                                                                                                                 | Location where item is reported (page#) |
|------------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| **TITLE**        |        |                                                                                                                                                                                                            |                                        |
| Title            | 1      | Identify the report as a systematic review.                                                                                                                                                               | 1                                      |
| **ABSTRACT**     |        |                                                                                                                                                                                                            |                                        |
| Abstract         | 2      | See the PRISMA 2020 for Abstracts checklist.                                                                                                                                                              | 1                                      |
| **INTRODUCTION** |        |                                                                                                                                                                                                            |                                        |
| Rationale        | 3      | Describe the rationale for the review in the context of existing knowledge.                                                                                                                                 | 2                                      |
| Objectives       | 4      | Provide an explicit statement of the objective(s) or question(s) the review addresses.                                                                                                                                 | 2                                      |
| **METHODS**      |        |                                                                                                                                                                                                            |                                        |
| Eligibility criteria | 5      | Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.                                                                                               | 3                                      |
| Information sources | 6      | Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted. | 2                                      |
| Search strategy  | 7      | Present the full search strategies for all databases, registers and websites, including any filters and limits used.                                                                                     | Table S2 (Supplementary file 2)        |
| Selection process | 8      | Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process. | 3                                      |
| Data collection process | 9      | Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process. | 3                                      |
| Data items       | 10a    | List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect. | 3                                      |
|                  | 10b    | List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information. | 3                                      |
| Study risk of bias assessment | 11  | Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process. | 3                                      |
| Effect measures  | 12     | Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.                                                                         | 3, 4                                   |
| Synthesis methods| 13a    | Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)). | N/A                                    |
|                  | 13b    | Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.                                                                 | 3                                      |
|                  | 13c    | Describe any methods used to tabulate or visually display results of individual studies and syntheses.                                                                                                      | N/A                                    |
|                  | 13d    | Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used. | 4                                      |
|                  | 13e    | Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).                                                                   | 4                                      |
| Section and Topic | Item # | Checklist item | Location where item is reported (page#) |
|------------------|--------|----------------|----------------------------------------|
| Reporting bias assessment | 13f | Describe any sensitivity analyses conducted to assess robustness of the synthesized results. | 3 |
| Certainty assessment | 14 | Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases). | 3 |
| | 15 | Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome. | N/A |
| RESULTS | 16a | Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram. | 4 |
| | 16b | Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded. | Table S3 (Supplementary file 3) |
| Study characteristics | 17 | Cite each included study and present its characteristics. | 5 |
| Risk of bias in studies | 18 | Present assessments of risk of bias for each included study. | 6-7 |
| Results of individual studies | 19 | For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots. | Figure 4-9 |
| Results of syntheses | 20a | For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies. | Table S5, S6 (Supplementary file 5, 6) |
| | 20b | Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect. | 7-10 |
| | 20c | Present results of all investigations of possible causes of heterogeneity among study results. | 12 |
| | 20d | Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results. | 10 |
| Reporting biases | 21 | Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed. | 11 |
| Certainty of evidence | 22 | Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed. | N/A |
| DISCUSSION | 23a | Provide a general interpretation of the results in the context of other evidence. | 11-12 |
| | 23b | Discuss any limitations of the evidence included in the review. | 12 |
| | 23c | Discuss any limitations of the review processes used. | 12 |
| | 23d | Discuss implications of the results for practice, policy, and future research. | 12-13 |
| OTHER INFORMATION | 24a | Provide registration information for the review, including register name and registration number, or state that the review was not registered. | N/A |
| Section and Topic | Item # | Checklist item | Location where item is reported (page#) |
|-------------------|--------|----------------|----------------------------------------|
| protocol          | 24b    | Indicate where the review protocol can be accessed, or state that a protocol was not prepared. | 2 |
|                   | 24c    | Describe and explain any amendments to information provided at registration or in the protocol. | N/A |
| Support           | 25     | Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review. | 13 |
| Competing interests| 26     | Declare any competing interests of review authors. | 13 |
| Availability of data, code and other materials | 27 | Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review. | Specified the available sources |

From: Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ 2021;372:n71. doi: 10.1136/bmj.n71

For more information, visit: [http://www.prisma-statement.org/](http://www.prisma-statement.org/)
## Supplementary File 2. Search strategy

| Database          | Search terms                                                                                                                                                                                                                                                                                                                                 |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| **PubMed**        | Article types: Clinical Study, Clinical Trial, Comparative Study, Randomized Controlled Trial and 2000-01-01~2021-03-01 (cataract*[MeSH Terms]) OR (cataract extraction*[MeSH Terms]) OR (capsule opacification*[MeSH Terms]) AND (silicone) OR (hydrophobic acrylic) AND (IOL) OR (intraocular lens*[MeSH Terms]) OR (intraocular lens implantation*[MeSH Terms]) OR (lenses, intraocular*[MeSH Terms]) OR (lens implantation, intraocular*[MeSH Terms])) NOT (pediatric cataract*) OR (children) |
| **Embase**        | Article types: Controlled clinical trial, Randomized controlled trial and 2000~2021 (cataract*/exp OR 'cataract extraction*/exp OR 'cataract operation*/exp OR 'cataract surgery'/exp) AND ('intraocular lens*/exp OR 'IOL'/exp OR 'lens implantation*/exp OR 'lens implant*/exp OR 'silicone'/exp OR 'Hydrophobic acrylic'/exp)) |
| **Cochrane library** | Article types: Trials and 2000-01-01~2021-03-01 ("intraocular lens"):ti AND ("silicone"):ti OR (hydrophobic acrylic):ti NOT ("pediatric"):ti AND ("cataract"):ti,ab,kw (Word variations have been searched)                                                                                         |
### Supplementary File 3. Excluded studies and reasons

| Authors                  | Title                                                                 | Reason for exclusion               |
|--------------------------|-----------------------------------------------------------------------|------------------------------------|
| Abela-Formanek C et al. 2002 | Inflammation after implantation of hydrophilic acrylic, hydrophobic acrylic, or silicone intraocular lenses in eyes with cataract and uveitis: comparison to a control group | Publication type not of interest |
| Abela-Formanek C et al. 2002 | Uveal and capsular biocompatibility of hydrophilic acrylic, hydrophobic acrylic, and silicone intraocular lenses | Insufficient data |
| Abela-Formanek C et al. 2002 | Results of hydrophilic acrylic, hydrophobic acrylic, and silicone intraocular lenses in uveitic eyes with cataract: comparison to a control group | Insufficient data |
| Auffarth GU et al. 2003  | Quantification of posterior capsule opacification with round and sharp edge intraocular lenses | Publication type not of interest |
| Auffarth GU et al. 2003  | Comparison of Nd : YAG capsulotomy rates following phacoemulsification with implantation of PMMA, silicone, or acrylic intra-ocular lenses in four European countries | diabetes requiring medical control |
| Beltrame G et al. 2002   | Posterior capsule opacification and Nd:YAG capsulotomy rates after implantation of silicone, hydrogel and soft acrylic intraocular lenses: a two-year follow-up study | Only abstract |
| Ding Y et al. 2009       | Quantification of posterior capsular opacification after cataract surgery | Only abstract |
| Elgohary MA et al. 2006  | Optical coherence tomography of intraocular lens implants and their relationship to the posterior capsule: a pilot study comparing a hydrophobic acrylic to a plate-haptic silicone type | Publication type not of interest |
| Georgopoulos M et al. 2003 | Influence of intraocular lens material on regeneratory posterior capsule opacification after neodymium:YAG laser capsulotomy | Insufficient data |
| Halpern MT et al. 2002   | Relationship of AcrySof acrylic and PhacoFlex silicone intraocular lenses to visual acuity and posterior capsule opacification | Insufficient data |
| Hütz WW et al. 2012      | Comparison of visual performance of silicone and acrylic multifocal IOLs utilizing the same diffractive design | Multifocal IOLs |
| Hwang IP et al. 2001     | Patient satisfaction after uneventful cataract surgery with implantation of a silicone or acrylic foldable intraocular lens. Comparative study | No wanted outcome |
| Jung CK et al. 2000      | Decentration and tilt: silicone multifocal versus acrylic soft intraocular lenses | Multifocal IOLs |
| Kremmer S et al. 2003    | Influence of cataract surgery with implantation of different intraocular lenses on scanning laser tomography and polarimetry | Publication type not of interest |
| Kremmer S et al. 2003    | Effect of AcrySof versus silicone or polymethyl methacrylate intraocular lens on posterior capsule opacification | Publication type not of interest |
| Ober MD et al. 2000      | Posterior capsular opacification in phacotrabeculectomy : a long-term comparative study of silicone versus acrylic intraocular lens | Patients not of interest |
| Papaliodis GN et al. 2002 | Intraocular lens tolerance in surgery for cataracta complicata: assessment of four implant materials | Insufficient data |
| Ram J et al. 2001        | Neodymium:YAG capsulotomy rates following phacoemulsification with implantation of PMMA, silicone, and acrylic intraocular lenses | Only abstract |
| Schrecker J et al. 2014  | Silicone-diffractive versus acrylic-refractive supplementary iols: visual performance and manual handling | Multifocal IOLs |
## Supplementary File 4. Characteristics of intraocular lenses included studies

| Study                | IOL group          | Model                  | Piece number | Haptic material | Edge design | PCO/ACO evaluation system |
|----------------------|--------------------|------------------------|--------------|-----------------|-------------|----------------------------|
| Abhilakh Missier KA et al. 2003 [26] | Hydrophobic acrylic | AcrySof MA30BA/MA60BM | 3            | PMMA            | sharp       | EPCO                       |
|                       | Silicone           | Staar AA4203VF         | 1            | plate-haptic    | N/A         |                            |
| Baumeister M et al. 2005 [27]     | Hydrophobic acrylic | AcrySof MA60          | 3            | PMMA            | sharp       | N/A                       |
|                       | Silicone           | CeeOn Edge 911A        | 3            | PVDF            | sharp       |                            |
| Daynes T et al. 2002 [28]          | Hydrophobic acrylic | AcrySof MA60/MA30     | 3            | PMMA            | sharp       | EPCO                       |
|                       | Silicone           | SI-40NB                | 3            | round           | N/A         | Scheimpflugig              |
| Findl O et al. 2005 [29]            | Hydrophobic acrylic | AcrySof MA60BM       | 3            | PMMA            | sharp       | AQUA                       |
|                       | Silicone           | CeeOn Edge 911A        | 3            | PVDF            | sharp       |                            |
| Hayashi K et al. 2001 [30]          | Hydrophobic acrylic | AcrySof MA60BM       | 3            | PMMA            | sharp       | Scheimpflugig              |
|                       | Silicone           | SI-30NB                | 3            | polypropylene   | round       |                            |
| Hayashi K et al. 2007 [31]          | Hydrophobic acrylic | AR40e                | 3            | PMMA            | sharp       | Scheimpflugig              |
|                       | Silicone           | ClariFlex              | 3            | PMMA            | sharp       |                            |
| Kim JS et al. 2001 [32]             | Hydrophobic acrylic | AcrySof MA60BM       | 3            | PMMA            | sharp       | N/A                       |
|                       | Silicone           | SI-30NB                | 3            | polypropylene   | round       |                            |
| Kohnen T et al. 2008 [33]            | Hydrophobic acrylic | AcrySof MA60BM       | 3            | PMMA            | sharp       | EPCO                       |
|                       | Silicone           | CeeOn Edge 911A        | 3            | PVDF            | N/A         |                            |
| Ernest PH et al. 2003 [34]           | Hydrophobic acrylic | AcrySof MA30BA      | 3            | PMMA            | sharp       | N/A                       |
|                       | Silicone           | SI-40NB                | 3            | round           | N/A         |                            |
| Pohjalainen T et al. 2002 [35]      | Hydrophobic acrylic | AcrySof MA60BM       | 3            | PMMA            | sharp       | N/A                       |
|                       | Silicone           | SI-30NB                | 3            | polypropylene   | round       |                            |
| Prosdocimo G et al. 2003 [36]       | Hydrophobic acrylic | AcrySof                | N/A          | PMMA            | sharp       | AQUA                       |
|                       | Silicone           | CeeOn Edge 911A        | 3            | PVDF            | sharp       | Adobe Photoshop            |
| Ronbeck M et al. 2014 [8]            | Hydrophobic acrylic | Acrysof MA60BM       | 3            | PMMA            | sharp       | POCOman                    |
| Sacu S et al. 2006 [37]              | Hydrophobic acrylic | AcrySof MA60BM       | 3            | PMMA            | sharp       | Adobe Photoshop            |
|                       | Silicone           | CeeOn Edge 911A        | 3            | PVDF            | sharp       |                            |
| Vock L et al. 2009 [7]               | Hydrophobic acrylic | AcrySof MA60BM       | 3            | PMMA            | sharp       | AQUA                       |
|                       | Silicone           | SI-30NB/SI-40NB        | 3            | Polypropylene/PMMA | round       |                            |
| Vock L, Crnej A et al. 2009 [9]      | Hydrophobic acrylic | AcrySof MA60BM       | 3            | PMMA            | sharp       | AQUA                       |
|                       | Silicone           | CeeOn Edge 911A        | 3            | PVDF            | sharp       |                            |
| Wejde G et al. 2004 [38]             | Hydrophobic acrylic | AcrySof MA60BM       | 3            | PMMA            | sharp       | EPCO                       |
|                       | Silicone           | SI-40NB                | 3            | round           | N/A         |                            |
| Zemaitiene R et al. 2011 [39]        | Hydrophobic acrylic | AcrySof MA30BA      | 3            | PMMA            | sharp       | EPCO                       |
|                       | Silicone           | CeeOn Edge 911A        | 3            | PVDF            | sharp       |                            |

ACO = anterior capsule opacification; IOL = intraocular lens; PMMA = polymethyl methacrylate; PVDF = polyvinylidene fluoride; PCO = posterior capsule opacification.
Supplementary File 5. Risk of bias assessment of randomized controlled trials

### Baumeister M 2005 [27]

| Bias                                      | Judgement | Support for judgement                                                                 |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Unclear   | “Patient randomization for the entire multicenter study were performed by the institute for Medical Statistics, Computer Science and Documentation of the Friedrich Schiller University, Jena, on behalf of Pharmacia Co.” |
| Allocation concealment (selection bias)   | Low       | The IOL to be implanted in the first eye was assigned according to a randomization scheme. |
| Blinding of participants and personnel (performance bias) | High     | “Both examiners were informed about the study and the different shapes of the IOLs. Thus, blinding of the examiners was not possible” |
| Blinding of outcome assessment (detection bias) | Unclear | Not reported                                                                          |
| Incomplete outcome data (attrition bias)  | Low       | A chart of participant flow was provided, and there were no missing values.             |
| Selective reporting (reporting bias)      | Low       | Approved protocol                                                                    |
|                                            |           | Results for predetermined outcomes were reported.                                    |
| Other bias                                | Low       | Not likely                                                                             |

### Ernest PH 2003 [34]

| Bias                                      | Judgement | Support for judgement                                                                 |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Unclear   | “Patients received 1 lens type in 1 eye and the other in the fellow eye and were randomized as to which lens was implanted first and in which eye” No further description of randomization provided. |
| Allocation concealment (selection bias)   | Unclear   | Not reported                                                                          |
| Blinding of participants and personnel (performance bias) | Unclear | Not reported                                                                          |
| Blinding of outcome assessment (detection bias) | Unclear | Not reported                                                                          |
| Incomplete outcome data (attrition bias)  | Low       | No dropouts                                                                           |
| Selective reporting (reporting bias)      | Low       | Results for predetermined outcomes were reported.                                    |
| Other bias                                | High      | “Financial support by Alcon laboratories, Inc., Fort Worth, Texas, USA. The author became a paid consultant of Alcon laboratories, Inc., approximately 3 years after the initiation of this study” |

### Findl O 2005 [29]

| Bias                                      | Judgement | Support for judgement                                                                 |
|-------------------------------------------|-----------|----------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Low       | “A randomization schedule of 60 allocations was supplied from a computer-derived list of random numbers” |
| Allocation concealment (selection bias)   | Low       | Each patient was allocated a unique trial number.                                      |
| Blinding of participants and personnel (performance bias) | Low     | Patient- and examiner-masked                                                         |
| Blinding of outcome assessment (detection bias) | High   | “The examiner who performed the slit-lamp examination obviously could not be masked any longer” |
| Incomplete outcome data (attrition bias)  | Low       | A chart of participant flow was provided.                                             |
| Selective reporting (reporting bias)      | Low       | A supporting protocol existed. Results for predetermined outcomes were reported.     |
| Other bias                                | Low       | Not likely                                                                             |
| Bias                                      | Judgement | Support for judgement                                                                 |
|------------------------------------------|-----------|---------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Low       | Initially randomized into 3 groups based on IOL type. All enrolled eyes were randomly allocated using the sealed-envelope method. |
| Allocation concealment (selection bias)  | Low       | All enrolled eyes were randomly allocated using the sealed-envelope method.            |
| Blinding of participants and personnel (performance bias) | Low       | Patients, examiners, and surgeons were masked.                                           |
| Blinding of outcome assessment (detection bias) | Low       | Patients, examiners, and surgeons were masked.                                           |
| Incomplete outcome data (attrition bias)  | Low       | “Of the 300 eyes, 10 in the PMMA IOL group, 17 in the silicone IOL group, and 4 in the acrylic IOL group were lost to follow-up. Thus, 269 eyes completed a 2 year follow-up and were available for analysis” |
| Selective reporting (reporting bias)      | Low       | “The study protocol was approved by the Institutional Review Board, and informed consent was obtained from each patient” |
| Other bias                                | Low       | Not likely                                                                               |

| Bias                                      | Judgement | Support for judgement                                                                 |
|------------------------------------------|-----------|---------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Low       | “The controller of this clinical trial generated a randomization code with equal numbers using random number tables, and, to ensure allocation concealment, the assignment schedule was kept concealed until all data were collected” |
| Allocation concealment (selection bias)  | Low       | All enrolled patients were randomly assigned the day before surgery to one of two groups. |
| Blinding of participants and personnel (performance bias) | Low       | All patients and examiners were masked as to randomization.                             |
| Blinding of outcome assessment (detection bias) | Low       | “The operating room personnel who allocated the IOLs to the patients were unaware of the purpose of this study. The examiners were also unaware of the type of IOL used because the two IOLs are the same in appearance. Furthermore, because the controller of this clinical trial assignment schedule was kept concealed until the end of the study, the data analyst, who was the surgeon, did not know the type of IOL used” |
| Incomplete outcome data (attrition bias)  | Low       | “Of the 100 patients enrolled, nine were lost to follow-up during the 36-month period: one patient died and two were hospitalized for an unrelated cause, one moved from the area, and five did not appear for reexamination because of an illness or scheduling conflict. In addition, in two patients the Scheimpflug image obtained was difficult to analyze. Therefore, 89 patients (89%) remained for analysis” |
| Selective reporting (reporting bias)      | Low       | Protocol approved Results for predetermined outcomes were reported.                     |
| Other bias                                | Low       | Not likely                                                                               |

| Bias                                      | Judgement | Support for judgement                                                                 |
|------------------------------------------|-----------|---------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Low       | Using the sealed envelope method, the eyes were stratified randomly into 3 groups based on the IOL type. |
| Allocation concealment (selection bias)  | Low       | Using the sealed envelope method                                                      |
| Blinding of participants and personnel (performance bias) | Unclear | Not reported                                                                           |
| Blinding of outcome assessment (detection bias) | Unclear | Not reported                                                                           |
| Incomplete outcome data (attrition bias)  | Low       | “Twenty-one patients (25 eyes) did not complete the follow-up, and these eyes were excluded, leaving 137 eyes for analysis” |
| Selective reporting (reporting bias)      | Low       | Results for predetermined outcomes were reported.                                     |
| Other bias                                | Unclear   | Uncertainty existed                                                                   |
Kohnen T 2008 [33]

| Bias                              | Judgement | Support for judgement                                                                 |
|-----------------------------------|-----------|---------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Low       | “The IOL type for the first operated eye was randomly assigned according to a code generated from a random-number table with blocking and stratification by center” |
| Allocation concealment (selection bias) | Low       | Randomly assigned (open-label)                                                         |
| Blinding of participants and personnel (performance bias) | Unclear   | Not reported                                                                           |
| Blinding of outcome assessment (detection bias) | Unclear   | Not reported                                                                           |
| Incomplete outcome data (attrition bias) | Low       | “Of the 288 randomized patients, 41 (14%) had to be excluded from analyses due to various reasons: severe complications during surgery (10), no surgery or adverse events before second surgery (7), refused further participation (12), and other (12)” |
| Selective reporting (reporting bias) | Low       | Results for predetermined outcomes were reported.                                      |
| Other bias                        | Unclear   | Uncertainty existed                                                                    |

Pohjalainen T 2002 [35]

| Bias                              | Judgement | Support for judgement                                                                 |
|-----------------------------------|-----------|---------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Unclear   | No further description of randomization was provided.                                 |
| Allocation concealment (selection bias) | Unclear   | Not reported                                                                           |
| Blinding of participants and personnel (performance bias) | Unclear   | Not reported                                                                           |
| Blinding of outcome assessment (detection bias) | Unclear   | Not reported                                                                           |
| Incomplete outcome data (attrition bias) | Low       | No missing values                                                                      |
| Selective reporting (reporting bias) | Low       | Results for predetermined outcomes were reported.                                      |
| Other bias                        | Low       | Not likely                                                                             |

Prosdocimo G 2003 [36]

| Bias                              | Judgement | Support for judgement                                                                 |
|-----------------------------------|-----------|---------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Unclear   | “In an open clinical study, 78 cataract patients were randomly selected to have implantation of a silicone CeeOn Edge (Pharmacia) or acrylate AcrySof (Alcon) IOL after phacoemulsification cataract surgery” No further description of randomization provided. |
| Allocation concealment (selection bias) | Unclear   | Not reported                                                                           |
| Blinding of participants and personnel (performance bias) | Unclear   | Not reported                                                                           |
| Blinding of outcome assessment (detection bias) | Unclear   | Not reported                                                                           |
| Incomplete outcome data (attrition bias) | Low       | Not reported of SD but IQR reported                                                    |
| Selective reporting (reporting bias) | Low       | All patients provided informed consent, and the data were collected in accordance with the International Standard Organization protocol for IOL studies. |
| Other bias                        | Low       | Not likely                                                                             |
### Ronbeck M 2014 [8]

| Bias                                           | Judgement | Support for judgement                                                                 |
|------------------------------------------------|-----------|----------------------------------------------------------------------------------------|
| Random sequence generation (selection bias)    | Low       | A randomization protocol was generated using computer software.                         |
| Allocation concealment (selection bias)        | Low       | The patients were assigned a study number that corresponded to 1 of the 3 IOLs.          |
| Blinding of participants and personnel (performance bias) | Unclear  | Not reported                                                                           |
| Blinding of outcome assessment (detection bias) | Unclear   | Not reported                                                                           |
| Incomplete outcome data (attrition bias)       | Low       | “Postoperatively, at 11.3 to 13.4 years (mean 12.3 years), 74 (39 women, 35 men) of the initial 180 patients were lost to follow-up; 52 patients died, 3 patients moved, 2 patients had dementia, 2 patients had an unknown illness, and 13 patients did not show up for unknown reasons. In addition, 1 patient was lost to follow-up because of aphasia and paralysis after a stroke and 1 patient was excluded because of intraoperative posterior capsule rupture… The statistical analysis of the median Nd:YAG survival time and the mean Nd:YAG overall survival included 179 patients; 1 patient in the silicone IOL group with intraoperative capsule rupture was excluded.” |
| Selective reporting (reporting bias)           | Low       | Results for predetermined outcomes were reported.                                      |
| Other bias                                     | Low       | Not likely                                                                             |

### Sacu S 2006 [37]

| Bias                                           | Judgement | Support for judgement                                                                 |
|------------------------------------------------|-----------|----------------------------------------------------------------------------------------|
| Random sequence generation (selection bias)    | Unclear   | “Posterior capsule opacification data from these patients have been published previously. The patients were recruited from a continuous cohort” No further description of randomization provided. |
| Allocation concealment (selection bias)        | Unclear   | “The IOL type for the first-operated eye of each patient was assigned randomly before surgery” No mention how to be assigned randomly. |
| Blinding of participants and personnel (performance bias) | Low       | Double-blind                                                                          |
| Blinding of outcome assessment (detection bias) | Unclear   | Not reported                                                                           |
| Incomplete outcome data (attrition bias)       | Low       | “Of the 52 patients who were included in the study, 43 patients were not available 1 year after surgery. Nine patients were not available for follow-up examination (one patient died before the 1-year follow-up examination; three patients were excluded after the operation because they were not operated bilaterally, and five patients could not be reached). One patient in group 1 and three patients group 2 were excluded because the pupil dilatation did not exceed the size of the capsulorrhexis edge, so 80 eyes of 40 patients were evaluated in each group” |
| Selective reporting (reporting bias)           | Unclear   | “The Ethics Committee of the Medical University of Vienna approved the protocol. Patients gave informed consent before inclusion into the study” |
| Other bias                                     | Low       | Not likely                                                                             |
### Vock L, Crnej A 2009 [9]

| Bias                                    | Judgement | Support for judgement                                                                 |
|-----------------------------------------|-----------|---------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Low       | Randomized by using numbers from a computer-generated list of random numbers.          |
| Allocation concealment (selection bias)  | Low       | “The first eye to be operated in each patient was randomly assigned to receive the silicone IOL (CeeOn Edge 911A) or the acrylic IOL (AcrySof MA60BM)” |
| Blinding of participants and personnel (performance bias) | Low       | Patient- and examiner-masked                                                          |
| Blinding of outcome assessment (detection bias) | Uncler   | Not reported                                                                          |
| Incomplete outcome data (attrition bias) | Low       | “Six other patients passed away during the follow-up period and one became a nursing case. In the other cases, the patients could not be traced and contacted anymore” A chart of participant flow was provided. |
| Selective reporting (reporting bias)     | Uncler   | Uncertainty existed                                                                    |
| Other bias                              | Low       | Not likely                                                                             |

### Wejde G 2004 [38]

| Bias                                    | Judgement | Support for judgement                                                                 |
|-----------------------------------------|-----------|---------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Unclear   | “The patients were randomized to implantation with either a silicone intraocular lens (IOL) (SI40NB, Allergan) or an AcrySof IOL (MA60BM, Alcon)” No further description of randomization was provided. |
| Allocation concealment (selection bias)  | Unclear   | Not reported                                                                          |
| Blinding of participants and personnel (performance bias) | Unclear   | Not reported                                                                          |
| Blinding of outcome assessment (detection bias) | Unclear   | Not reported                                                                          |
| Incomplete outcome data (attrition bias) | Low       | “Twenty-seven patients were lost to follow-up because they were not available for examination or were excluded because the images did not visualize the entire anterior capsulorhexis margin” |
| Selective reporting (reporting bias)     | Low       | Results for predetermined outcomes were reported.                                      |
| Other bias                              | Low       | Not likely                                                                             |

### Zemaitienė R 2011 [39]

| Bias                                    | Judgement | Support for judgement                                                                 |
|-----------------------------------------|-----------|---------------------------------------------------------------------------------------|
| Random sequence generation (selection bias) | Unclear   | “After the patients provided informed consent, they were randomly assigned to receive a 3-piece AcrySof MA3OBA hydrophobic acrylic IOL or 1-piece AcrySof SA3OAL hydrophobic acrylic IOL or 3-piece CeeOn 911A silicone IOL.” No further description of randomization was provided. |
| Allocation concealment (selection bias)  | Unclear   | Not reported                                                                          |
| Blinding of participants and personnel (performance bias) | High      | Non-blinded                                                                           |
| Blinding of outcome assessment (detection bias) | High      | Non-blinded                                                                           |
| Incomplete outcome data (attrition bias) | Low       | “Seven patients were known to have died, and 6 patients were too ill or frail to attend. It was not possible to contact 2 patients. Three patients refused to participate in the study” |
| Selective reporting (reporting bias)     | Low       | Results for predetermined outcomes were reported.                                      |
| Other bias                              | Low       | Not likely                                                                             |
## Supplementary File 6. Risk of bias assessment of non-randomized controlled trials

### Abhilakh Missier KA 2003 [26]

| Bias                          | Judgement | Support for judgement                                                                 |
|-------------------------------|-----------|----------------------------------------------------------------------------------------|
| Bias due to confounding       | Low       | No prognostic variables (factors that predict the outcome of interest) and no changed IOLs |
| Bias due to selection of participants | Low       | “In each patient, 1 eye was randomly selected to receive an MA30BA (n=77) or MA60BM (n=30) AcrySof acrylate IOL and the other eye, an AA4203 VF plate-haptic silicone IOL. Randomization was performed using computerized random number generator” |
| Bias in classification of interventions | Low       | Randomization was performed using a computerized random number generator. |
| Bias due to deviations from intended interventions | Low       | No systematic differences between intervention and comparison groups                   |
| Bias due to missing data      | Low       | No missing patients (All patients were examined.)                                       |
| Bias in measurement of outcomes | Low       | All follow-up visits were performed by the same observer (K.A.A.M)                     |
| Bias in selection of the reported result | Low       | No any suspicious reports                                                              |

### Daynes T 2002 [28]

| Bias                          | Judgement | Support for judgement                                                                 |
|-------------------------------|-----------|----------------------------------------------------------------------------------------|
| Bias due to confounding       | Low       | No prognostic variables (factors that predict the outcome of interest) and no changed IOLs |
| Bias due to selection of participants | High      | “Patients with at least 3 years of follow-up were reviewed consecutively and retrospectively for evidence of uneventful surgery with no evidence of sight-limiting pathology and at least 20/25 uncorrected visual acuity in the early postoperative period. Patients who met these preliminary criteria were called consecutively and asked to come in for a comprehensive examination. Approximately 60% of patients were contacted; half agreed to come for the examination” Only eligible patients were included (good visual acuity) so there was no examination of all patients (60%). |
| Bias in classification of interventions | Low       | No suspicious bias of classification                                                     |
| Bias due to deviations from intended interventions | Low       | No systematic differences between intervention and comparison groups                   |
| Bias due to missing data      | Low       | All of the responded patients were reported but 60%.                                     |
| Bias in measurement of outcomes | Low       | All examinations were carried out in a masked fashion.                                  |
| Bias in selection of the reported result | Low       | No any suspicious reports                                                              |

### Vock L 2009 [7]

| Bias                          | Judgement | Support for judgement                                                                 |
|-------------------------------|-----------|----------------------------------------------------------------------------------------|
| Bias due to confounding       | Low       | No prognostic variables (factors that predict the outcome of interest) and no changed IOLs |
| Bias due to selection of participants | Low       | “Patients having had cataract surgery and implantation of at least 1 study IOL by the same surgeon between 1994 and 1999 were retrospectively examined. These patients were recruited and invited by letter to have a voluntary eye examination. Of 298 eligible patients, 98 accepted the invitation and 46 were reported to have died; the others did not respond to the invitation for unknown reasons” |
| Bias in classification of interventions | Low       | No suspicious bias of classification                                                     |
| Bias due to deviations from intended interventions | Low       | No systematic differences between intervention and comparison groups                   |
| Bias due to missing data      | Low       | Showed with/without imputation of missing values                                         |
| Bias in measurement of outcomes | Low       | Use of the same evaluation software                                                      |
| Bias in selection of the reported result | Low       | No any suspicious reports                                                              |
Supplementary File 7. Forest plots

a. The overall effect of PCO value (Chi^2 = chi-square statistic, CI = confidence interval, df = degrees of freedom, I^2 = I-squared, heterogeneity statistic, IV = inverse variance, SMD = standard mean difference, Z = Z-statistic).

| Study or Subgroup | Silicone Mean | Hydrophobic Mean | Std. Mean Difference | Std. Mean Difference |
|-------------------|---------------|------------------|---------------------|---------------------|
|                   | Mean | SD   | Total  | Mean | SD   | Total  | IV  | Random, 95% CI | IV  | Random, 95% CI |
| Abhijith Mislier KA 2003 | 1.178 | 1.636 | 107 | 2.056 | 1.415 | 107 | 11.4% | -0.57 [-0.85, -0.30] |
| Daynes T 2002 | 0.42 | 0.52 | 43 | 0.55 | 0.66 | 52 | 10.0% | -0.21 [-0.62, 0.19] |
| Find O 2005 | 1.9 | 1.6 | 56 | 2.3 | 1.6 | 56 | 10.4% | -0.19 [-0.66, 0.30] |
| Hayashi K 2001 | 14.1 | 9.2 | 83 | 11.7 | 7.6 | 96 | 11.2% | 0.29 [-0.01, 0.58] |
| Kohnen T 2008 | 0.0005 | 0.235 | 60 | 0.044 | 0.289 | 60 | 10.5% | -0.16 [-0.52, 0.19] |
| Prodocimo G 2003 | 0.08 | 0.17 | 40 | 0.305 | 0.47 | 38 | 9.4% | -0.78 [-1.24, -0.32] |
| Vock L. Otnj A 2009 | 1.4 | 2.6 | 44 | 2.78 | 2.78 | 99 | 10.5% | -0.50 [-0.86, -0.14] |
| Vock L 2009 | 2.3 | 1.4 | 22 | 2.8 | 2.2 | 22 | 7.8% | -0.85 [-1.47, -0.23] |
| Weibe O 2004 | 0.233 | 0.235 | 47 | 0.056 | 0.269 | 45 | 9.9% | 0.64 [0.22, 1.06] |
| Zemaitiene R 2011 | 0.158 | 0.194 | 30 | 0.171 | 0.208 | 31 | 9.2% | -0.96 [-0.57, 0.44] |
| Total (95% CI) | 532 | 606 | 100.0% | 106 | -0.23 [-0.50, 0.03] |

Heterogeneity: Tau^2 = 0.16; Chi^2 = 46.08, df = 9 (P < 0.00001); I^2 = 80%
Test for overall effect: Z = 1.81 (P = 0.11)

b. The overall effect of Nd:YAG capsulotomy rate (Chi^2 = chi-square statistic, CI = confidence interval, df = degrees of freedom, I^2 = I-squared, heterogeneity statistic, M-H = Mantel-Haenszel estimate, RR = risk ratio, Z = Z-statistic).

| Study or Subgroup | Silicone Events | Hydrophobic Events | Risk Ratio | Risk Ratio |
|-------------------|----------------|------------------|------------|------------|
|                   | Mean | SD   | Total  | Mean | SD   | Total  | Weight | M-H, Fixed, 95% CI | Weight | M-H, Fixed, 95% CI |
| Abhijith Mislier KA 2003 | 25 | 107 | 3 | 107 | 3.3% | 8.33 [2.59, 26.77] |
| Ernemet PO 2003 | 33 | 74 | 17 | 82 | 17.8% | 2.15 [1.31, 3.52] |
| Find O 2005 | 1 | 56 | 1 | 56 | 11.1% | 1.00 [0.96, 1.59] |
| Hayashi K 2001 | 12 | 83 | 4 | 63 | 4.4% | 3.00 [1.01, 8.92] |
| Kohnen T 2008 | 3 | 89 | 7 | 89 | 7.7% | 0.43 [0.11, 1.60] |
| Prodocimo G 2003 | 2 | 96 | 2 | 96 | 2.2% | 1.00 [0.14, 6.95] |
| Zemaitiene R 2011 | 0 | 40 | 1 | 38 | 1.7% | 0.32 [0.01, 7.55] |
| Total (95% CI) | 740 | 801 | 100.0% | 106 | 1.21 [0.94, 1.56] |

Heterogeneity: Chi^2 = 37.21, df = 11 (P = 0.0001); I^2 = 70%
Test for overall effect: Z = 1.49 (P = 0.14)
### a. Subgroup analysis of PCO value

| Study or Subgroup | Favour Silicone | Hydrophobic | Std. Mean Difference |
|-------------------|----------------|-------------|---------------------|
|                   | Mean | SD | Total | Mean | SD | Total | Weight | IV | Random | 95% CI | Mean | SD | Total | Weight | IV | Random | 95% CI |
| 1.1.1 Group 1 (n=43) |       |     |       |       |     |       |        |     |         |       |       |     |       |        |     |         |       |
| Findi O 2005      | 1.5  | 1.5 | 56    | 1.7  | 1.6 | 56    | 0.98   | -0.06 | [0.00, 0.31] |       |       |     |       |        |     |         |       |
| Heyer K 2001      | 14.1 | 9.2 | 33    | 11.7 | 7.6 | 96    | 10.5%  | 0.29  | [0.01, 0.58] |       |       |     |       |        |     |         |       |
| Procadio G 2003   | 0.089| 0.17| 40    | 0.365| 0.47| 38    | 8.9%   | -0.78 | [-1.24, -0.32] |       |       |     |       |        |     |         |       |
| Vock L, CrnJ A 2009 | 1.5  | 0.7 | 22    | 1.7  | 0.7 | 22    | 7.6%   | -0.14 | [-0.73, 0.44] |       |       |     |       |        |     |         |       |
| Subtotal (95% CI) | 291  | 212 | 36.8% | -0.15 | [-0.61, 0.30] |       |       |         |       |
| Heterogeneity: $\tau^2 = 0.17$, $\chi^2 = 14.69$, df = 3 (P = 0.002); $I^2 = 80\%$ |
| Test for overall effect: $Z = 0.66$ (P = 0.51) |

| 1.1.2 Group 2 (n=49) |       |     |       |       |     |       |        |     |         |       |       |     |       |        |     |         |       |
| Aldehyde Monomer KA 2003 | 2.066 | 1.410 | 107 | 1.178 | 1.636 | 107 | 10.7% | 0.57 | [0.30, 0.84] |       |       |     |       |        |     |         |       |
| Daynes T 2002      | 0.42  | 0.52 | 43    | 0.55  | 0.66 | 52    | 9.4%   | -0.21 | [-0.62, 0.18] |       |       |     |       |        |     |         |       |
| Findi O 2005      | 1.5  | 1.6 | 56    | 2.2  | 1.6 | 56    | 9.8%   | -0.19 | [-0.66, 0.30] |       |       |     |       |        |     |         |       |
| Kohmen T 2008      | 0.005 | 0.235 | 60 | 0.044 | 0.209 | 60 | 0.09% | -0.18 | [-0.52, 0.19] |       |       |     |       |        |     |         |       |
| Vock L, CrnJ A 2009 | 1.9  | 1.1 | 22    | 2.6  | 0.9 | 22    | 7.8%   | -0.10 | [-0.69, 0.48] |       |       |     |       |        |     |         |       |
| Wage G 2014        | 0.233 | 0.235 | 47 | 0.054 | 0.289 | 48 | 0.09% | 0.64 | [0.22, 0.106] |       |       |     |       |        |     |         |       |
| Zemalének R 2011   | 0.158 | 0.194 | 30 | 0.171 | 0.208 | 31 | 8.5% | -0.06 | [0.07, 0.44] |       |       |     |       |        |     |         |       |
| Subtotal (95% CI) | 258  | 268 | 48.6% | 0.62 | [0.35, 0.84] |       |       |         |       |
| Heterogeneity: $\tau^2 = 0.13$, $\chi^2 = 16.74$, df = 4 (P = 0.002); $I^2 = 76\%$ |
| Test for overall effect: $Z = 0.13$ (P = 0.90) |

| 1.1.3 Group 3 (n=69) |       |     |       |       |     |       |        |     |         |       |       |     |       |        |     |         |       |
| Vock L, CrnJ A 2009 | 2.3  | 1.4 | 22    | 3.8  | 22 | 7.4% | -0.05 | [-1.47, -0.23] |       |       |     |       |        |     |         |       |
| Vock L 2009        | 1.4  | 2.6 | 44    | 2.76 | 2.78 | 99    | 9.9% | -0.59 | [0.06, 0.14] |       |       |     |       |        |     |         |       |
| Subtotal (95% CI) | 66  | 121 | 17.3% | -0.59 | [-0.86, -0.32] |       |       |         |       |
| Heterogeneity: $\tau^2 = 0.00$, $\chi^2 = 0.95$, df = 1 (P = 0.33); $P = 0\%$ |
| Test for overall effect: $Z = 3.61$ (P = 0.0002) |

| Total (95% CI) | 525 | 601 | 100.0% | -0.16 | [-0.43, 0.11] |       |       |         |       |
| Heterogeneity: $\tau^2 = 0.16$, $\chi^2 = 48.07$, df = 10 (P = 0.00001); $I^2 = 79\%$ |
| Test for overall effect: $Z = 1.15$ (P = 0.24) |
| Test for subgroup differences: $\chi^2 = 6.54$, df = 2 (P = 0.04); $I^2 = 69.4\%$ |

### b. The overall effect of ACO value

| Study or Subgroup | Silicone | Hydrophobic | Std. Mean Difference |
|-------------------|----------|-------------|---------------------|
|                   | Mean | SD | Total | Mean | SD | Total | Weight | IV | Random | 95% CI | Mean | SD | Total | Weight | IV | Random | 95% CI |
| Daynes T 2002      | 0.59  | 0.46 | 43    | 0.32  | 0.3 | 52    | 34.0% | 0.70 | [0.29, 1.12] |       |       |     |       |        |     |         |       |
| Findi O 2005      | 19.5  | 8    | 56    | 19.7 | 0.56 | 56    | 0.0%  | -0.02 | [-0.49, 0.35] |       |       |     |       |        |     |         |       |
| Sacu S 2006       | 0.2   | 0.08 | 53    | 0.21  | 0.08 | 53    | 34.6% | -0.12 | [-0.51, 0.26] |       |       |     |       |        |     |         |       |
| Zemalének R 2011 | 2.333 | 0.758 | 30 | 1.58  | 0.866 | 31 | 31.2% | 0.90 | [0.37, 1.43] |       |       |     |       |        |     |         |       |
| Total (95% CI) | 126 | 136 | 100.0% | 0.48 | [-0.16, 1.12] |       |       |         |       |
| Heterogeneity: $\tau^2 = 0.27$, $\chi^2 = 12.75$, df = 2 (P = 0.002); $I^2 = 84\%$ |
| Test for overall effect: $Z = 1.46$ (P = 0.14) |
Supplementary File 9. Funnel plots of publication bias

a. Subgroup analysis effects of PCO value (SE = standard error, SMD = standard mean difference).

b. Subgroup analysis effects of Nd:YAG capsulotomy rate (SE = standard error, RR = risk ratio).
c. The overall effect of ACO (SE = standard error, SMD = standard mean difference).

d. The overall effect of visual acuity (SE = standard error, MD = mean difference).
e. The overall effect of tilt (SE = standard error, MD = mean difference).

f. The overall effect of decentration (SE = standard error, MD = mean difference).