Table 16: Studies included in the evidence review for partial breast radiotherapy

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Full citation Coles, Charlotte E., Griffin, Clare L., Kirby, Anna M., Titley, Jenny, Agrawal, Rajiv K., Alhasso, Abdulla, Bhattacharya, Indrani S., Brunt, Adrian M., Ciurlionis, Laura, Chan, Charlie, Donovan, Ellen M., Emson, Marie A., Harnett, Adrian N., Haviland, Joanne S., Hopwood, Penelope, Jefford, Monica L., Kaggwa, Ronald, Sawyer, Elinor J., Syndikus, Isabel, Tsang, Yat M., Wheatley, Duncan A., Wilcox, Maggie, Yarnold, John R., Bliss, Judith M., Al Sarakbi, Wail, Barber, Sarah, Barnett, Gillian, Bliss, Peter, Dewar, John, Eaton, David, Ebbs, Stephen, Ellis, Ian, Evans, Philip, Harris, Emma, James, Hayley, Kirwan, Cliona, Kirk, Julie, Mayles, Helen, McIntyre, Anne, Mills, Judith, Poynter, Andrew, Provenzano,	**Sample size** n=2018 randomised (two women withdrew consent for use of their data in the analysis). n=2016 available for analysis (n=674 whole-breast radiotherapy, n=673 reduced-dose group, and n=669 in the partial-breast group) **Characteristics** Whole-breast radiotherapy (n=674) vs Partial-breast group (n=669) Mean age (IQR range): 62 (57-67) vs 62 (57-67) Pathological tumour size (cm) (IQR range):1.2 (0.8-1.5) vs 1.2 (0.8-1.6) Tumour grade 1: 298/672 (44%) vs 284/668 (43%) Tumour grade 2: 310/672 (46%) vs 320/668 (48%) Tumour grade 3: 64/672 (10%) vs 63/668 (9%)	**Interventions** 1) Whole-breast radiotherapy received 40 Gy in 15 fractions to the whole breast. 2) Reduced-dose group received 36 Gy in 15 fractions to the whole breast and 40 Gy in 15 fractions to the partial breast containing the tumour bed. 3) Partial-breast group received 40 Gy in 15 fractions to the partial breast only.	**Details** Primary Outcomes: Local recurrence in the ipsilateral breast parenchyma or overlying skin. Secondary Outcomes: Location of local tumour relapse, time to regional relapse (axilla, supraclavicular fossa, and internal mammary chain), time to distant relapse, disease-free survival , overall survival, contralateral breast cancers, and other second primary cancers. Patient-reported outcomes substudy completed the European Organisation for Research and Treatment of Cancer (EORTC) QLQ-C30 core questionnaire, EORTC QLQ-BR23 breast cancer module, body-image scale, protocol-specific questions (has skin appearance changed, overall breast appearance changed, breast become smaller, breast become harder or firmer to touch, or is shoulder stiffness present?), Hospital Anxiety and Depression Scale, and the	**Results** **Comparison: Partial breast radiotherapy (PBI) vs. Whole breast radiotherapy (WBRT) at 5 years cumulative follow-up** Outcome: Local relapse PBI: 6/669 WBRT: 9/674 Outcome: Local regional relapse PBI: 8/669 WBRT: 9/674 Outcome: Distant relapse PBI: 12/669 WBRT: 13/674 Outcome: Any breast-cancer-related event PBI: 33/669 WBRT: 33/674 Outcome: All-cause mortality PBI: 37/669 WBRT: 40/674	**Limitations** **Cochrane risk of bias tool** Random sequence generation: Low risk. Women randomly assigned in a 1:1:1 ratio to the three arms using computer generated random permuted blocks (Mixed sizes of six and nine), stratified by treatment centre. Allocation concealment: Unclear risk. Unclear if research staff who telephoned treatment centres to obtain treatment allocation and trial ID number were blinded. Blinding of participants and personnel (Objective outcomes): High risk (patients and investigators were not blinded to treatment arm) Blinding of participants and personnel (Subjective outcomes): High risk

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Elena, Rawlings, Christine, Sculpher, Mark, Sumo, Georges, Sydenham, Mark, Tutt, Andrew, Twyman, Nicola, Venables, Karen, Winship, Anna, Winstanley, John, Wishart, Gordon, Partial-breast radiotherapy after breast conservation surgery for patients with early breast cancer (UK IMPORT LOW trial): 5-year results from a multicentre, randomised, controlled, phase 3, non-inferiority trial, The Lancet, Online First - In Press, Corrected Proof, 2017 **Ref Id** 664212 **Country/ies where the study was carried out** United Kingdom **Study type** Multi-centre RCT **Aim of the study** To compare the safety and efficacy of standard whole-breast radiotherapy (control, whole-breast	**Inclusion criteria** Women ≥ 50 years undergoing breast conserving surgery for unifocal invasive ductal adenocarcinoma of any grade (1–3); pathological tumour size ≤ 3 cm (pT1–2), axillary node negative or one to three positive nodes (pN0–1), microscopic margins of non-cancerous tissue ≥ 2 mm. **Exclusion criteria** Invasive carcinoma of classical lobular type; distant metastases; previous malignancy of any kind (unless non-melanomatous skin cancer); undergone a mastectomy; received neoadjuvant chemotherapy or concurrent adjuvant chemoradiotherapy.		EuroQol EQ-5D-3L health status questionnaire (at baseline (before randomisation), 6 months, and 1, 2, and 5 years). Symptomatic rib fracture, symptomatic lung fibrosis, and ischaemic heart disease incidence (at 1, 2, 5, and 10-year follow-up).	Mild or marked changes in breast appearance at 2 years PBI: 31/333 WBRT: 37/332 Mild or marked changes in breast appearance at 5 years PBI: 50/279 WBRT: 60/262 Protocol specific items, cumulative number of adverse events 5 year cumulative incidence:- - Breast appearance changed PBI: 113/421 WBRT: 158/411 - Breast smaller PBI: 119/421 WBRT: 104/411 - Breast harder or firmer PBI: 58/421 WBRT: 115/411 - Shoulder stiffness PBI: 58/421 WBRT: 56/411 - Skin appearance changed	(patients and investigators were not blinded to treatment arm) Blinding of outcome assessment (Objective outcomes): High risk (clinicians and investigators were not blinded to treatment arm) Blinding of outcome assessment (Subjective outcomes): High risk (patients and investigators were not blinded to treatment arm) Incomplete outcome data: Low risk Selective reporting: Low risk Other bias: Low risk **Other information** The authors here report on IMPORT LOW. Two sub-studies investigating late adverse effects and patient reported outcomes, including the European Organisation for Research and Treatment of Cancer (EORTC) QLQ-C30 core questionnaire (EORTC QLQ-BR23), will be

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
group) with experimental schedules of radiotherapy to the whole breast and partial breast (reduced-dose group), and to the partial breast only in women at lower than average risk of local relapse. **Study dates** May 2007 - October 2010 **Source of funding** Cancer Research UK				PBI: 49/421 WBRT: 63/411 EORTC QLQ-BR23 related items, cumulative number of adverse events 5 year cumulative incidence: - - Arm or shoulder pain PBI: 97/421 WBRT: 98/411 - Swollen arm or hand PBI: 16/421 WBRT: 21/411 - Difficulty raising arm PBI: 47/421 WBRT: 42/411 - Breast pain PBI: 64/421 WBRT: 67/411 - Breast swollen PBI: 17/421 WBRT: 31/411 - Breast over sensitive PBI: 54/421 WBRT: 64/411	reported in additional papers.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
				- Skin problems in breast PBI: 35/421 WBRT: 50/411	
Full citation Hickey, Brigid E, Lehman, Margot, Francis, Daniel P, See, Adrienne M, Partial breast irradiation for early breast cancer, Cochrane Database of Systematic Reviews, 2016 **Ref Id** 553396 **Country/ies where the study was carried out** **Study type** Cochrane Systematic Review **Aim of the study** To investigate whether partial breast irradiation (PBI) is equivalent to or better than conventional or hypofractionated whole breast radiotherapy (WRBT) following breast-	**Sample size** **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** N=520 randomised **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** N=258 randomised **RAPID (Reported on by Olivotto 2013)** N=2135 randomised **Rodriguez 2013** N=102 randomised **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** N=1184 randomised **Characteristics** **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** Population: 520 women aged > 40 years	**Interventions** **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** 1) Partial breast irradiation (PBI) or accelerated partial breast irradiation (APBI) using intensity-modulated radiotherapy (IMRT). 2) Whole breast radiotherapy (WBRT); used 50 Gy/25 fractions plus 10 Gy boost. **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** 1) PBI; 7 × 5.2GyHDRmulti-catheter brachytherapy (88/128 women). Those unsuitable for HDR (40/1280 women) had 50 Gy/25 fractions electron beam RT to partial breast.	**Details** **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** Design: RCT; Single centre. Outcomes: Not specified. **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** Design: RCT; Single-centre trial. Primary Outcomes: Local recurrence in the ipsilateral breast at 5 years; Cosmetic outcome (using the Harvard cosmetic score) Secondary Outcomes: Overall survival; Toxicity; Cause-specific mortality (deaths due to breast cancer at 5 years); Distant metastasis-free survival at 5 years; Relapse-free survival at 5 years; Subsequent mastectomy (ipsilateral partial mastectomy, modified radical mastectomy or radical mastectomy);	**Results** **Comparison: PBI/APBI vs. WBRT** Outcome: Local recurrence-free survival (5 years follow up) **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** PBI/APBI: 9/633 WBRT: 5/551 **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** PBI/APBI: 0/260 WBRT: 3/260 **Rodriguez 2013** PBI/APBI: 0/51 WBRT: 0/51 **Outcome: Local recurrence-free survival (10 years follow up)** **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)**	**Limitations** **Quality of the SR**: Assessed using AMSTAR checklist Total score: 11/11. **Quality of individual studies:** Extracte from the Cochrane SR (Cochrane risk of bias tool) **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** Random sequence generation: Low risk Allocation concealment: Low risk Blinding of participants and personnel (Objective outcomes): Low risk Blinding of participants and personnel (Subjective outcomes): Low risk

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
conserving therapy for early stage breast cancer. **Study dates** Searches complete up to May 2015 **Source of funding** Internal sources No sources of support supplied. External sources Princess Alexandra Cancer Collaborative Group, Australia.	Setting: Italy, single institution trial from a cancer centre. **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** Population: 258 randomised women aged < 40 years Setting: Hungary, single institution trial from a tertiary institution. **RAPID (Reported on by Olivotto 2013)** Population: 2135 women aged ≥ 40 years. Setting: Canada, Australia, New Zealand. Multicentered, international study. **Rodriguez 2013** Population: 102 women aged ≥ 60 years old. Setting: Spain, single institution trial from a tertiary institution. **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)**	2) Control arm: 50 Gy/25 fractions WBRT (130 women) **RAPID (Reported on by Olivotto 2013)** 1) APBI using three-dimensional conformal radiotherapy (3D-CRT): 38.5 Gy in 10 fractions, bd over 5-8 days. 6-8 hour gap between doses. 2) WBRT; 42.5 Gy in 16 fractions daily over 22 days. Women with large breast size: 50 Gy in 25 fractions over 25 days. Boost 10 Gy in 4 or 5 fractions over 4-7 days was permitted women who were deemed at moderate to high risk of LR according to local cancer centre guidelines. **Rodriguez 2013** 1) PBI/APBI delivered by 3D-CRT at 48Gy/24 fractions ± 10 Gy boost (according to risk factors for local recurrence) in 51 women. 2) Conventional WBRT at 48 Gy/24 fractions ±	Compliance, defined as the number of women who commence treatment with PBI/APBI or conventional EBRT and complete the treatment course. **RAPID (Reported on by Olivotto 2013)** Design: Phase III RCT; stratified for age, tumour histology, tumour size, adjuvant hormonal therapy and clinical centre. Primary Outcomes: Ipsilateral breast tumour recurrence (defined as recurrent invasive or in situ cancer in the ipsilateral breast including the axillary tail), median follow-up 36 months. Secondary Outcomes: Adverse cosmetic outcome; Disease-free survival; Event-free survival; Overall survival; Radiation toxicity; Quality of life; Cost effectiveness. **Rodriguez 2013** Design: Phase III RCT (relative non-inferiority). Median follow-up time was 5 years. Outcomes: Local control; Dosimetry and toxicity (using RTOG CTC); Skin elasticity	PBI/APBI: 7/128 WBRT: 6/130 Outcome: Cosmesis, physician-reported **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** PBI/APBI: 0/246 WBRT: 2/260 **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** PBI/APBI: 24/125 WBRT: 43/116 **RAPID (Reported on by Olivotto 2013)** PBI/APBI: 140/399 WBRT: 61/367 **Rodriguez 2013** PBI/APBI: 12/51 WBRT: 8/51 Outcome: Overall survival **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** PBI/APBI: 27/633 WBRT: 32/551	Blinding of outcome assessment (Objective outcomes): Low risk Blinding of outcome assessment (Subjective outcomes): High risk (clinicians and investigators were not blinded to treatment arm) Incomplete outcome data: Low risk Selective reporting: Low risk Other bias: Low risk **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** Random sequence generation: Low risk Allocation concealment: Unclear risk (description of allocation concealment incomplete) Blinding of participants and personnel (Objective outcomes): Low risk Blinding of participants and personnel (Subjective outcomes): Low risk

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
	Population: 1184 women aged > 40 years Setting: Austria, Czech Republic, Germany, Hungary, Poland, Spain, and Switzerland. Multi-centered study in hospitals and medical centres. **Inclusion criteria** **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** Wide local excision or quadrantectomy for invasive breast cancer, negative margins and tumour size 2.5 cm or less. **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** Invasive breast cancer after wide local excision of tumour and negative pathological margins (unifocal tumours, tumour size less than 20 mm, clinically or pathologically N0, or single microscopic nodal metastasis (greater than 0.2 mm and less than 2.0 mm), that is, pT1N0-1miM0, Grade I or II; T1N0-N1miM0, Grade I or II. **RAPID (Reported on by Olivotto 2013)**	10 Gy boost in 51 women. **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** 1) APBI Interstitial brachytherapy; HDR 32 Gy/8 fractions or 30.3 Gy/7 fractions; PDR 50 Gy at 0.6-0.8 Gy/fractions given hourly. 2) External beam WBRT 50.0-50.4 Gy/1.8-2.0 Gy fractions (5-28) plus 10 Gy/5 fraction boost.	measured using a dedicated device. Median follow-up time was 5 years. **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** Design: Phase III RCT; Open-label trial. Primary Outcomes: Local recurrence, 5 year follow up. Secondary Outcomes: Incidence and severity of acute and late adverse effects; Differences in cosmetic results; Distant metastases disease-free survival; Survival rates (overall survival, disease-free survival); Contralateral breast cancer rate; Quality of life. Median follow up of 5 years.	**Livi 2015 (Reported on by Livi 2010 and Livi 2015)** PBI/APBI: 1/260 WBRT: 7/260 **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** PBI/APBI: 25/128 WBRT: 23/130 Outcome: Acute radiotherapy (RT) skin toxicity. **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** PBI/APBI: 5/246 WBRT: 98/260 **Rodriguez 2013** PBI/APBI: 9/51 WBRT: 38/51 Outcome: Outcome 5 Late RT skin toxicity. **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** PBI/APBI: 0/246 WBRT: 2/260 **Rodriguez 2013** PBI/APBI: 0/51	Blinding of outcome assessment (Objective outcomes): Low risk Blinding of outcome assessment (Subjective outcomes): High risk (No mention of Participants, Physicians or Assessors being blinded) Incomplete outcome data: Low risk Selective reporting: Low risk Other bias: Low risk RAPID (Reported on by Olivotto 2013) Random sequence generation: Low risk Allocation concealment: Unclear risk (inadequate details of allocation concealment) Blinding of participants and personnel (Objective outcomes): Low risk Blinding of participants and personnel (Subjective outcomes): Low risk Blinding of outcome assessment (Objective outcomes): Low risk

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
	Either invasive ductal carcinoma or ductal carcinoma in situ with tumours 3.3 cm or greater, with negative margins. **Rodriguez 2013** pT1-2pN0M0 invasive ductal carcinoma, with tumour size 3 cm or less, with negative margins and Grade I or II histology. **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** Small T1-2N0-miM0 (less than 3 cm) with negative margins and Tis. **Exclusion criteria** **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** Not reported. **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** Not reported. **RAPID (Reported on by Olivotto 2013)** No involved axillary nodes. **Rodriguez 2013** Not reported.			WBRT: 0/51 Outcome: Fat necrosis **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** PBI/APBI: 26/127 WBRT: 26/129 **RAPID (Reported on by Olivotto 2013)** PBI/APBI: 12/399 WBRT: 4/367 Outcome: 'Elsewhere primary **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** PBI/APBI: 3/633 WBRT: 4/551 **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** PBI/APBI: 3/260 WBRT: 0/260 Outcome: Case-specific survival **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** PBI/APBI: 4/633 WBRT: 4/551	Blinding of outcome assessment (Subjective outcomes): Low risk Incomplete outcome data: Unclear risk (exclusions and attrition not assessed) Selective reporting: Unclear risk (interim report) Other bias: Unclear risk (No other sources of bias noted) **Rodriguez 2013** Random sequence generation: Low risk Allocation concealment: Unclear risk (Not clearly described) Blinding of participants and personnel (Objective outcomes): Low risk Blinding of participants and personnel (Subjective outcomes): Low risk Blinding of outcome assessment (Objective outcomes): Low risk Blinding of outcome assessment (Subjective outcomes): High risk (Acute, late RT toxicity

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
	GEC-ESTRO (Reported by Ott 2016, Strnad 2016) No lympho-vascular invasion (LVI) and women with multifocal tumours.			**Livi 2015 (Reported on by Livi 2010 and Livi 2015)** PBI/APBI: 1/260 WBRT: 3/260 **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** PBI/APBI: 6/128 WBRT: 10/130 Outcome: Distant metastasis-free survival. **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** PBI/APBI: 5/633 WBRT: 5/551 **Livi 2015 (Reported on by Livi 2010 and Livi 2015)** PBI/APBI: 3/260 WBRT: 4/260 **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)** PBI/APBI: 11/128 WBRT: 14/130 Outcome: Relapse-free survival.	and cosmesis were evaluated by the treating physician and patients) Incomplete outcome data: Low risk Selective reporting: Low risk Other bias: Low risk **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** Random sequence generation: Low risk Allocation concealment: Low risk Blinding of participants and personnel (Objective outcomes): Low risk Blinding of participants and personnel (Subjective outcomes): Low risk Blinding of outcome assessment (Objective outcomes): Low risk Blinding of outcome assessment (Subjective outcomes): High risk (Blinding of outcome assessors was not mentioned) Incomplete outcome data: Low risk

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
				Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013) PBI/APBI: 19/128 WBRT: 20/130 **Rodriguez 2013** PBI/APBI: 0/51 WBRT: 0/51 Outcome: Locoregional recurrence-free survival **Rodriguez 2013** PBI/APBI: 0/51 WBRT: 0/51 Outcome: Masectomy **GEC-ESTRO (Reported by Ott 2016, Strnad 2016)** PBI/APBI: 1/633 WBRT: 0/551 **Polgár 2007 (Reported on by Lovey 2007, Polgár 2007, Polgár 2013)**	Selective reporting: Low risk Other bias: Low risk **Other information** Interim results from Livi 2015 on skin toxicity results are reported on in Livi 2010. Meattini 2017 present the early and 2-year follow-up health-related quality of life results from Livi 2015. Additional results from Polgár 2007 are reported in Lovey 2007,and Polgár 2013. Further results from GEC-ESTRO reported in Ott 2016.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
				PBI/APBI: 0/128 WBRT: 2/130	
Full citation Livi, L., Buonamici, F. B., Simontacchi, G., Scotti, V., Fambrini, M., Compagnucci, A., Paiar, F., Scoccianti, S., Pallotta, S., Detti, B., Agresti, B., Talamonti, C., Mangoni, M., Bianchi, S., Cataliotti, L., Marrazzo, L., Bucciolini, M., Biti, G., Accelerated Partial Breast Irradiation With IMRT: New Technical Approach and Interim Analysis of Acute Toxicity in a Phase III Randomized Clinical Trial, International Journal of Radiation Oncology Biology Physics, 77, 509-515, 2010 **Ref Id** 664582 **Country/ies where the study was carried out** Italy **Study type**	**Sample size** n=259 women randomised. **Characteristics** APBI (131) vs. WBT (128) **Inclusion criteria** Age at presentation >40 years; Tumor size ≥25 mm; Wide excision or quadrantectomy with clear margins (≤5 mm); Clips placed in tumor bed; Full informed consent from patient; Follow-up at he radiotherapy department of Florence University. **Exclusion criteria** Cardiac dysfunction (Left ventricular ejection fraction <50% as measured by echocardiography or history of active angina, myocardial infarction, or other cardiovascular disease); Forced expiratory volume <1 L/m; Extensive intraductal carcinoma; Multifocal cancer; Psychiatric problems; Follow-up at center other than the radiotherapy department of Florence University.	**Interventions** Please see Hickey 2016 Cochrane systematic review.	**Details** Outcomes: Acute skin toxicity measured using the Radiation Therapy Oncology Group scale.	**Results** **Comparison: PBI/APBI vs. WBRT** Outcome: Grade 1 acute skin toxicity APBI: 5% of 131 WBRT: 22% of 128 Outcome: Grade 2 acute skin toxicity APBI: 0.8% of 131 WBRT: 19% of 128	**Limitations** Please see Hickey 2016 Cochrane systematic review. **Other information** Here the authors report on acute skin toxicity from September 2008 where the RCT had recruited 259 patients from a target of 520 patients. Livi 2015 provides skin toxicity results for the completed target of 520 patients.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
RCT **Aim of the study** To compare the use of accelerated partial breast irradiation (APBI) with external intensity-modulated radiotherapy (IMRT) to conventional fractionated whole breast treatment (WBT) in patients with early-stage breast cancer and to analyze the acute toxicity. **Study dates** March 2005 - September 2013 (As reported in Livi 2015). Here authors here present results from September 2008. **Source of funding** None disclosed.					
Full citation Livi, L., Meattini, I., Marrazzo, L., Simontacchi, G., Pallotta, S., Saieva, C., Paiar, F., Scotti, V., De Luca Cardillo, C.,	**Sample size** Please see Hickey 2016 Cochrane systematic review. **Characteristics**	**Interventions** Please see Hickey 2016 Cochrane systematic review.	**Details** Please see Hickey 2016 Cochrane systematic review.	**Results** Please see Hickey 2016 Cochrane systematic review.	**Limitations** Please see Hickey 2016 Cochrane systematic review.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Bastiani, P., Orzalesi, L., Casella, D., Sanchez, L., Nori, J., Fambrini, M., Bianchi, S., Accelerated partial breast irradiation using intensity-modulated radiotherapy versus whole breast irradiation: 5-year survival analysis of a phase 3 randomised controlled trial, European Journal of Cancer, 51, 451-463, 2015 **Ref Id** 611859 **Country/ies where the study was carried out** Italy **Study type** RCT **Aim of the study** To compare the use of accelerated partial breast irradiation (APBI) with external intensity-modulated radiotherapy (IMRT) to conventional fractionated whole breast treatment (WBT) in patients with early-stage breast cancer and analyse local	Please see Hickey 2016 Cochrane systematic review. **Inclusion criteria** Age at presentation >40 years with early breast cancer (maximum diameter 2.5 cm); Tumor size ≥25 mm; Wide excision or quadrantectomy with clear margins (≤5 mm); Clips placed in tumor bed; Full informed consent from patient; Follow-up at the radiotherapy department of Florence University. **Exclusion criteria** Previously diagnosed solid tumours; left ventricular ejection fraction (LVEF) <50% as measured by echocardiography or a history of active angina, myocardial infarction, or other cardiovascular disease; forced expiratory volume in 1s (FEV1) <1 L/m; extensive intraductal carcinoma; multiple foci cancer; final surgical margins <5 mm; and the absence of surgical clips in tumour bed.				**Other information** Results for acute skin toxicity from September 2008 where the RCT had recruited 259 patients from a target of 520 patients are reported in Livi 2010.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
recurrence and survival rates. **Study dates** March 2005 - September 2013 **Source of funding** None disclosed.					
Full citation Lovey, K., Fodor, J., Major, T., Szabo, E., Orosz, Z., Sulyok, Z., Janvary, L., Frohlich, G., Kasler, M., Polgar, C., Fat Necrosis After Partial-Breast Irradiation With Brachytherapy or Electron Irradiation Versus Standard Whole-Breast Radiotherapy-4-Year Results of a Randomized Trial, International Journal of Radiation Oncology Biology Physics, 69, 724-731, 2007 **Ref Id** 538435 **Country/ies where the study was carried out**	**Sample size** Please see Hickey 2016 Cochrane systematic review. **Characteristics** Please see Hickey 2016 Cochrane systematic review. **Inclusion criteria** Women aged < 40 years with pT1 pN0-1mi, nonlobular breast cancer without the presence of extensive intraductal component, and resected with negative margins **Exclusion criteria** None reported.	**Interventions** Please see Hickey 2016 Cochrane systematic review.	**Details** Outcomes: Fat necrosis determined by an institutional scoring scheme to grade fat necroses.	**Results** **Comparison: PBI/APBI vs. WBRT** Outcome: Fat necrosis with a median follow-up of 4 years WBI: 32/129 HDR-BT: 7/87 ELE: 7/40	**Limitations** Please see Hickey 2016 Cochrane systematic review. **Other information** Further results from this RCT are presented in Polgár 2007 and Polgár 2013.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Hungary **Study type** RCT **Aim of the study** To investigate in patients with early-stage breast cancer the incidence and clinical relevance of fat necrosis after the use of accelerated partial-breast irradiation (APBI) using interstitial high-dose-rate brachytherapy (HDR-BT) in comparison with partial-breast electron irradiation (ELE) and whole-breast irradiation (WBI). **Study dates** July 1998 - May 2004 **Source of funding** None disclosed.					
Full citation Meattini, I., Saieva, C., Miccinesi, G., Desideri, I., Francolini, G., Scotti, V., Marrazzo, L., Pallotta, S., Meacci, F.,	**Sample size** Please see Livi 2015. **Characteristics** Please see Livi 2015.	**Interventions** Please see Livi 2015.	**Details** Outcomes: HRQoL (reported at short-term and 2-year follow-up)	**Results** **Comparison: Accelerated partial breast irradiation (APBI) vs. whole breast irradiation (WBI)**	**Limitations** Please see Livi 2015. **Other information** The 5-year results of this APBI-IMRT-Florence

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Muntoni, C., Bendinelli, B., Sanchez, L. J., Bernini, M., Orzalesi, L., Nori, J., Bianchi, S., Livi, L., Accelerated partial breast irradiation using intensity modulated radiotherapy versus whole breast irradiation: Health-related quality of life final analysis from the Florence phase 3 trial, European journal of cancer, 76, 17-26, 2017 **Ref Id** 664623 **Country/ies where the study was carried out** Italy **Study type** RCT **Aim of the study** To compare the use of accelerated partial breast irradiation (APBI) with external intensity-modulated radiotherapy (IMRT) to conventional fractionated whole breast treatment (WBT) in patients with early-stage breast cancer and analyse early and	**Inclusion criteria** Please see Livi 2015. **Exclusion criteria** Please see Livi 2015.			Mean values (and SD) of QLQ-C30 scores at 2 years follow up Outcome: Global health status APBI: 75.5 (13.3) WBI: 59.5 (22.0) Outcome: Physical functioning APBI: 90.9 (10.9) WBI: 79.9 (17.8) Outcome: Role functioning APBI: 91.3 (15.7) WBI: 80.2 (24.2) Outcome: Emotional functioning APBI: 85.0 (14.6) WBI: 69.8 (26.2) Outcome: Cognitive functioning APBI: 90.8 (10.3) WBI: 77.7 (20.3) Outcome: Social functioning APBI: 96.7 (7.8) WBI: 82.8 (18.6) Outcome: Fatigue APBI: 15.5 (16.0) WBI: 27.3 (23.7)	phase 3 randomised trial on disease failure, acute and early late toxicity are presented in Livi 2015.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
2-year follow-up health-related quality of life (HRQoL) results. **Study dates** March 2015 - June 2013 **Source of funding** None declared.				Outcome: Nausea-vomiting APBI: 1.0 (4.5) WBI: 8.3 (13.1) Outcome: Pain APBI: 7.3 (14.0) WBI: 21.8 (21.3) Outcome: Dyspnoea APBI: 13.0 (18.8) WBI: 18.3 (22.4) Outcome: Insomnia APBI: 10.5 (20.3) WBI: 28.3 (27.0) Outcome: Appetite loss APBI: 3.2 (13.5) WBI: 14.0 (22.8) Outcome: Constipation APBI: 13.3 (20.5) WBI: 16.0 (24.8) Outcome: Diarrhoea APBI: 2.9 (11.4) WBI: 6.3 (16.2) Outcome: Financial difficulties	

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
				APBI: 4.4 (18.5) WBI: 12.0 (22.0) Mean values of QLQ-BR23 scores Outcome: Body image APBI: 89.0 (13.2) WBI: 72.1 (26.6) Outcome: Sexual functioning APBI: 24.9 (30.4) WBI: 18.3 (19.9) Outcome: Sexual enjoyment APBI: 57.1 (18.0) WBI: 49.5 (21.7) Outcome: Future perspective APBI: 84.8 (23.1) WBI: 57.0 (28.5) Outcome: Systemic therapy side-effects APBI: 11.5 (9.8) WBI: 17.4 (13.3) Outcome: Breast symptoms APBI: 6.1 (6.6) WBI: 18.9 (18.2) Outcome: Arm symptoms	

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
				APBI: 11.7 (13.4) WBI: 19.6 (19.0) Outcome: Hair loss APBI: 31.8 (17.3) WBI: 36.3 (25.4)	
Full citation Olivotto, I. A., Whelan, T. J., Parpia, S., Kim, D. H., Berrang, T., Truong, P. T., Kong, I., Cochrane, B., Nichol, A., Roy, I., Germain, I., Akra, M., Reed, M., Fyles, A., Trotter, T., Perera, F., Beckham, W., Levine, M. N., Julian, J. A., Interim cosmetic and toxicity results from RAPID: A randomized trial of accelerated partial breast irradiation using three-dimensional conformal external beam radiation therapy, Journal of Clinical Oncology, 31, 4038-4045, 2013 **Ref Id** 552558	**Sample size** Please see Hickey 2016 Cochrane systematic review. **Characteristics** Please see Hickey 2016 Cochrane systematic review. **Inclusion criteria** Women ≥ 40 years with invasive ductal carcinoma or ductal carcinoma in situ (DCIS) treated with BCS with microscopically clear margins and negative axillary nodes by sentinel node biopsy, or axillary dissection for those with invasive disease, or by clinical examination for those with DCIS alone. **Exclusion criteria** Women < 40 years; combined tumor size (DCIS and/or invasive carcinoma)>3 cm,	**Interventions** Please see Hickey 2016 Cochrane systematic review.	**Details** Please see Hickey 2016 Cochrane systematic review. Outcomes: ipsilateral breast tumor recurrence (IBTR). Secondary outcomes: Cosmesis (adverse cosmesis defined scored as fair or poor using European Organisation for Research and Treatment of Cancer Cosmetic Rating System), toxicity.	**Results** Please see Hickey 2016 Cochrane systematic review. Outcome: Outcome: Physician reported cosmesis, 3 years PBI/APBI: 140/399 WBRT: 61/367 Outcome: Nurse reported cosmesis, 5 years PBI/APBI: 56/171 WBRT: 22/164 Outcome: Patient reported cosmesis, 5 years PBI/APBI: 55/170 WBRT: 34/258	**Limitations** Please see Hickey 2016 Cochrane systematic review. **Other information** This is an interim report as part of the RAPID (Randomized Trial of Accelerated Partial Breast Irradiation) trial.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Country/ies where the study was carried out Canada, Australia, New Zealand. **Study type** Multi-centre RCT **Aim of the study** To compare the use of three-dimensional conformal RT (3D-CRT) with whole-breast irradiation (WBI) in patients with early-stage breast cancer and analyse the impact of cosmesis and normal tissue toxicity. **Study dates** February 2006 - July 2011 **Source of funding** Supported in part by Grants No. 78567 and 114947 from the Canadian Institutes for Health Research and No. 016421 from the Canadian Breast Cancer Research Alliance.	lobular carcinoma, > one primary tumor in different quadrants of the breast, or an RT plan that did not meet protocol-defined dose-volume constraints for APBI.				

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Full citation Ott, O. J., Strnad, V., Hildebrandt, G., Kauer-Dorner, D., Knauerhase, H., Major, T., Lyczek, J., Guinot, J. L., Dunst, J., Miguelez, C. G., Slampa, P., Allgauer, M., Lossl, K., Polat, B., Kovacs, G., Fischedick, A. R., Wendt, T. G., Fietkau, R., Kortmann, R. D., Resch, A., Kulik, A., Arribas, L., Niehoff, P., Guedea, F., Schlamann, A., Potter, R., Gall, C., Malzer, M., Uter, W., Polgar, C., GEC-ESTRO multicenter phase 3-trial: Accelerated partial breast irradiation with interstitial multicatheter brachytherapy versus external beam whole breast irradiation: Early toxicity and patient compliance, Radiotherapy and Oncology, 120, 119-123, 2016 **Ref Id** 553472 **Country/ies where the study was carried out**	**Sample size** Please see Hickey 2016 Cochrane systematic review. **Characteristics** Please see Hickey 2016 Cochrane systematic review. **Inclusion criteria** Women aged ≥ 40 years; histologically confirmed invasive breast cancer or ductal carcinoma in situ (DCIS) UICC stage 0–IIA, a maximum tumor diameter 6 3 cm, complete resection with clear marginsP2 mm (in case of invasive lobular cancer or pure DCISP5 mm), at least six negative axillary lymph nodes (pN0), or singular nodal micro-metastasis (pN1mi), or negative sentinel node biopsy (pN0sn), or a clinically negative axilla in case of DCIS (cN0), no distant metastasis or contralateral breast cancer. **Exclusion criteria** Any signs of a multifocal growth pattern in mammography, had residual micro-calcifications post-operatively, an extensive intraductal component (EIC), vessel invasion (L1, V1), involved, close (<2 mm) or	**Interventions** Please see Hickey 2016 Cochrane systematic review.	**Details** Outcomes: Early side effects (classified according to the Common Terminology Criteria for Adverse Events v3.0 (CTCAE; publish date: June 10, 2003)); late side effects (classified according to RTOG/EORTC criteria and Lent Soma Scores); Toxicity (defined as early if it occurred within the first 90 days from the start of radiotherapy).	**Results** **Comparison: APBI vs. WBI** Outcome: Early skin reaction (radiodermatitis) WBI: 513/552 APBI: 134/630 Outcome: Mild hematoma WBI: 10/553 APBI: 127/630 Outcome: Breast infection rate) WBI: 11/552 APBI: 32/630 Outcome: Low grade intraoperative breast injury WBI: 4/553 APBI: 31/630 Outcome: Breast Pain WBI: 161/553 APBI: 161/630	**Limitations** Please see Hickey 2016 Cochrane systematic review. **Other information** Long-term results from the Groupe Européen de Curiethérapie of European Society for Radiotherapy and Oncology (GEC-ESTRO) multicentre, phase 3, randomised controlled trial are presented in Strnard 2016. Late side-effects and cosmesis for this trial are presented in Polgar 2017.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Austria, Czech Republic, Germany, Hungary, Poland, Spain, and Switzerland **Study type** Multi-centre RCT **Aim of the study** To compare accelerated partial breast irradiation (APBI) with multicatheter brachytherapy to external beam whole breast irradiation (WBI) in patients with early-stage breast cancer and analyse early side effects and patient compliance. **Study dates** April 2004 - July 2009 **Source of funding** German Cancer Aid (Deutsche Krebshilfe e.V.; Grant Number 106288)	unknown margins (R1/Rx), or were pregnant.				
Full citation	**Sample size**	**Interventions**	**Details**	**Results**	**Limitations**
Polgar, C., Fodor, J., Major, T., Nemeth, G., Lovey, K., Orosz, Z.,	Please see Hickey 2016 Cochrane systematic review.	Please see Hickey 2016 Cochrane systematic review.	Outcomes: Local recurrence; 5-year probability; overall survival; cancer-specific	**Please see Hickey 2016 Cochrane systematic review.**	Please see Hickey 2016 Cochrane systematic review.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Sulyok, Z., Takacsi-Nagy, Z., Kasler, M., Breast-Conserving Treatment With Partial or Whole Breast Irradiation for Low-Risk Invasive Breast Carcinoma-5-Year Results of a Randomized Trial, International Journal of Radiation Oncology Biology Physics, 69, 694-702, 2007 **Ref Id** 580095 **Country/ies where the study was carried out** Hungary **Study type** RCT **Aim of the study** To compare partial breast irradiation (PBI) with conventional whole breast irradiation (WBI) in patients with early-stage breast cancer and analyse the 5-year results of survival and cosmetic results. **Study dates** July 1998 - May 2004	**Characteristics** Please see Hickey 2016 Cochrane systematic review. **Inclusion criteria** Women > 40 years; Wide excision with microscopically negative surgical margins; unifocal tumor; primary tumor size ≤20 mm (pT1); cN0, pN0, or pN1mi (single nodal micrometastasis >0.2mmand≤2.0 mm) axillary status; and histologic Grade 2 or less. **Exclusion criteria** Women ≤ 40 years; bilateral breast carcinoma; prior uni- or contralateral breast cancer; concomitant or previous other malignancies (except basal cell carcinoma of the skin); pure ductal or lobular carcinoma in situ (pTis); invasive lobular carcinoma; or the presence of an extensive intraductal component.		survival; disease-free survival	**Comparison: PBI vs. WBI** Outcome: Local recurrence at 5 years follow up WBI: 4/130 PBI: 6/128 Outcome: 5-year probability of overall survival WBI: 91.8% (95% CI, 86.3–97.4%) PBI: 94.6% (95% CI, 90.2–99.1%) Outcome: 5-year probability of cancer-specific survival WBI: 96.0% (95% CI, 92.4–99.6%) PBI: 98.3% (95% CI, 96.0–100%) Outcome: 5-year disease-free survival WBI: 90.3% (95% CI, 84.5–96.1%) PBI: 88.3% (95% CI, 81.3–95.2%)	**Other information** Polgar 2013 presents the 10 year follow-up results from the Polgar 2007 trial.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Source of funding None disclosed.					
Full citation Polgar, C., Fodor, J., Major, T., Sulyok, Z., Kasler, M., Breast-conserving therapy with partial or whole breast irradiation: Ten-year results of the Budapest randomized trial, Radiotherapy and Oncology, 108, 197-202, 2013 **Ref Id** 538607 **Country/ies where the study was carried out** Hungary **Study type** RCT **Aim of the study** To compare partial breast irradiation (PBI) with conventional whole breast irradiation (WBI) in patients with early-stage breast cancer and analyse	**Sample size** Please see Hickey 2016 Cochrane systematic review. **Characteristics** Please see Hickey 2016 Cochrane systematic review. **Inclusion criteria** Please see Polgar 2007. **Exclusion criteria** Please see Polgar 2007.	**Interventions** Please see Hickey 2016 Cochrane systematic review.	**Details** Please see Hickey 2016 Cochrane systematic review.	**Results** Please see Hickey 2016 Cochrane systematic review.	**Limitations** Please see Hickey 2016 Cochrane systematic review. **Other information** Polgar 2007 presents the 5 year results of this trial.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
the 10-year results of survival and cosmetic results. **Study dates** July 1998 - May 2004 **Source of funding** None disclosed.					
Full citation Polgar, C., Ott, O. J., Hildebrandt, G., Kauer-Dorner, D., Knauerhase, H., Major, T., Lyczek, J., Guinot, J. L., Dunst, J., Miguelez, C. G., Slampa, P., Allgauer, M., Lossl, K., Polat, B., Kovacs, G., Fischedick, A. R., Fietkau, R., Resch, A., Kulik, A., Arribas, L., Niehoff, P., Guedea, F., Schlamann, A., Potter, R., Gall, C., Uter, W., Strnad, V., Late side-effects and cosmetic results of accelerated partial breast irradiation with interstitial brachytherapy versus whole-breast irradiation after breast-conserving surgery for low-risk invasive and in-situ carcinoma of the female breast: 5-year results of	**Sample size** Please see Hickey 2016 Cochrane systematic review. **Characteristics** Please see Hickey 2016 Cochrane systematic review. **Inclusion criteria** Women aged ≥ 40 years with ductal carcinoma in situ (pTis) or invasive breast carcinoma up to a diameter of 3 cm (pT1–2a), with pN0 or pN1mi axillary status (stage 0, I, and IIA) who had undergone local excision of the breast tumour with microscopically clear resection margins of at least 2 mm. **Exclusion criteria** Multiple tumour foci, lymphovascular invasion, an extensive intraductal	**Interventions** Please see Hickey 2016 Cochrane systematic review.	**Details** Please see Hickey 2016 Cochrane systematic review. Outcomes: late side-effects (occurring >3 months after radiotherapy) grade 2 or worse severity of any toxicity, any skin toxicity (including skin hyper pigmentation and skin telangiectasia), any subcutaneous tissue toxicity (including fibrosis and fat necrosis), arm lymphoedema, and breast pain.	**Results** **Comparison: APBI vs. WBRT** Outcome: Cosmesis 5 year follow up, physician-reported fair to poor APBI: 39/542 WBRT: 46/454 Outcome: Cosmesis 5 year follow up, patient-reported fair to poor APBI: 43/541 WBRT: 41/454 Outcome: Skin RTOG/EORTC	**Limitations** Please see Hickey 2016 Cochrane systematic review. **Other information**

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
a randomised, controlled, phase 3 trial, The Lancet Oncology., 2017 **Ref Id** 580945 **Country/ies where the study was carried out** Austria, Czech Republic, Germany, Hungary, Poland, Spain, and Switzerland **Study type** Multi-centre RCT **Aim of the study** To compare accelerated partial breast irradiation (APBI) with multicatheter brachytherapy to external beam whole breast irradiation (WBI) in patients with early-stage breast cancer and analyse late side-effects and cosmesis. **Study dates** April 2004 - July 2009 **Source of funding** German Cancer Aid.	component, Paget's disease or pathological skin involvement, synchronous or previous breast cancer, safety margins that could not be microscopically assessed, a history of other malignant disease, or were pregnant or breastfeeding.			APBI: 69/484 WBRT: 69/393 Outcome: Skin telangiectasia APBI: 49/483 WBRT: 40/392 Outcome: Skin hyperpigmentation APBI: 27/484 WBRT: 40/392 Outcome: Subcutaneous tissue RTOG/EORTC APBI: 204/485 WBRT: 145/393 Outcome: Fibrosis APBI: 187/484 WBRT: 138/392 Outcome: Fat necrosis APBI: 44/484 WBRT: 28/393 Outcome: Pain APBI: 105/484 WBRT: 84/393 Outcome: Arm lymphoedema	

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
				APBI: 11/483 WBRT: 16/393	
Full citation Rodriguez, N., Sanz, X., Dengra, J., Foro, P., Membrive, I., Reig, A., Quera, J., Fernandez-Velilla, E., Pera, O., Lio, J., Lozano, J., Algara, M., Five-year outcomes, cosmesis, and toxicity with 3-dimensional conformal external beam radiation therapy to deliver accelerated partial breast irradiation, International Journal of Radiation Oncology Biology Physics, 87, 1051-1057, 2013 **Ref Id** 614611 **Country/ies where the study was carried out** Spain **Study type** RCT	**Sample size** Please see Hickey 2016 Cochrane systematic review. **Characteristics** Please see Hickey 2016 Cochrane systematic review. **Inclusion criteria** Women age ≥60 years; invasive ductal carcinoma; unifocal tumor; primary tumor size ≤30 mm (pT2); cN0, pN0 axillary status; and histologic grade 2 or less. **Exclusion criteria** Bilateral breast carcinoma; prior unilateral or contralateral breast cancer; concomitant or other previous malignancies; pure ductal or lobular carcinoma in situ (pTis); invasive lobular carcinoma; presence of an extensive intraductal component; excision with microscopically positive or close (3 mm)	**Interventions** Please see Hickey 2016 Cochrane systematic review.	**Details** Please see Hickey 2016 Cochrane systematic review.	**Results** Please see Hickey 2016 Cochrane systematic review. Survival rates: The authors report no significant differences in survival rates were found. No data provided.	**Limitations** Please see Hickey 2016 Cochrane systematic review. **Other information**

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
Aim of the study To compare accelerated partial breast irradiation (APBI) and whole breast irradiation (WBI) using 3-dimensional conformal external beam radiation therapy (3D-CRT) in patients with early-stage breast cancer and present the interim results analysing the efficacy, toxicity, and cosmesis of the breast-conserving treatments. **Study dates** Not reported. **Source of funding** None disclosed.	surgical margins; multicentric disease; nodepositive disease; concomitant or neoadjuvant chemotherapy; and postsurgical hematoma >2 cm, or seroma fluid that required multiple aspirations.				
Full citation Strnad, V., Ott, O. J., Hildebrandt, G., Kauer-Dorner, D., Knauerhase, H., Major, T., Lyczek, J., Guinot, J. L., Dunst, J., Miguelez, C. G., Slampa, P., Allgauer, M., Lossl, K., Polat, B., Kovacs, G., Fischedick, A. R., Wendt, T. G., Fietkau,	**Sample size** Please see Hickey 2016 Cochrane systematic review. **Characteristics** Please see Hickey 2016 Cochrane systematic review. **Inclusion criteria**	**Interventions** Please see Hickey 2016 Cochrane systematic review.	**Details** Please see Hickey 2016 Cochrane systematic review.	**Results** Please see Hickey 2016 Cochrane systematic review.	**Limitations** Please see Hickey 2016 Cochrane systematic review. **Other information** Early side effect results from the Groupe Européen de Curiethérapie of European Society

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
R., Hindemith, M., Resch, A., Kulik, A., Arribas, L., Niehoff, P., Guedea, F., Schlamann, A., Potter, R., Gall, C., Malzer, M., Uter, W., Polgar, C., 5-year results of accelerated partial breast irradiation using sole interstitial multicatheter brachytherapy versus whole-breast irradiation with boost after breast-conserving surgery for low-risk invasive and in-situ carcinoma of the female breast: A randomised, phase 3, non-inferiority trial, The Lancet, 387, 229-238, 2016 **Ref Id** 553507 **Country/ies where the study was carried out** Austria, Czech Republic, Germany, Hungary, Poland, Spain, and Switzerland. **Study type** Multi-centre RCT **Aim of the study**	Women ≥ aged 40 years; pTis or pT1–2a (lesions of ≤3 cm diameter), pN0/pNmi, and M0 breast cancer (stage 0, I, and IIA), undergone local excision of the breast tumour with microscopically clear resection margins of at least 2 mm in any direction; no lymph or blood-vessel invasion (L0, V0); DCIS lesions classified as low or intermediate risk (Van Nuys prognostic index <8); axillary dissection with minimum of six nodes in the specimen or a negative sentinel node was required in patients with invasive carcinoma; axillary staging in case of pure DCIS. **Exclusion criteria** Women aged < 40 years; multiple tumour foci or an extensive intraductal component; Paget's disease or pathological skin involvement; synchronous or previous breast cancer; history of other malignant disease; pregnant or lactating.				for Radiotherapy and Oncology (GEC-ESTRO) multicentre, phase 3, randomised controlled trial are presented in Ott 2016. Late side-effects and cosmesis for this trial are presented in Polgar 2017.

Study details	Participants	Interventions	Methods	Outcomes and results	Comments
To compare accelerated partial breast irradiation (APBI) and whole-breast irradiation in patients with stage 0, I, and IIA breast cancer. **Study dates** April 2004 -July 2009 **Source of funding** German Cancer Aid and consultation fees from Nucletron Operations BV, an Elekta Company.					

3D-CRT: 3 dimensional conformal radiotherapy; APBI: Accelerated partial breast irradiation; BCS: breast conserving surgery; CTC, Common Toxicity Criteria; DCIS: ductal carcinoma in situ; EIC: extensive intraductal component; EORTC QLQ-30: European Organisation for Research and Treatment of Cancer Quality of Life Questionairre; EQ5D: EuroQol Research Foundation measure of general health status; GEC-ESTRO: The Groupe Européen de Curiethérapie and the European SocieTy for Radiotherapy & Oncology; Gy: Gray; HDR: High dose rate; HRQoL: health-related quality of life; IMPORT: Intensity Modulated and Partial Organ Radiotherapy; IMRT: intensity modulated radiotherapy; IQR: interquartile range; LVI: lymphovascular invasion; NCI, National Cancer Institute; PBI: Partial breast irradiation; PDR: Pulsed dose rate; RAPID: Randomized Trial of Accelerated Partial Breast Irradiation; RCT: randomised controlled trial; RT: radiotherapy; RTOG: Radiation Therapy Oncology Group; SD: standard deviation; SOMA-LENT: SOMA-LENT: Subjective, Objective, Management, Analytic-Late Effects of Normal Tissues; SR: systematic review; UICC: Union for International Cancer Control; WBRT: Whole breast radiotherapy