Additional file 3: Summary of extracted information from included literature.

Aims/purpose/research question; study design; setting; data collection dates; sampling strategy; sample size and characteristics	**Method(s) of complication assessment**	**Relevant findings (excluding data on predictors)**
Arfken et al. 1998		
To compare the risk of developing proliferative DR in African-American and White participants with type 1 diabetes Cross-sectional design; case note audit U.S.A.; 'model demonstration units', number unclear Data collection period unclear Sampling strategy unclear; inclusion criteria: subjects with type 1 diabetes (age of onset of ≤ 40 years, continuous insulin usage); African-American or White; at least 2 visits with gradable eye photographs; if > 2 visits, visits chosen to maximise follow-up duration n 312 (n 97 (African-American participants); n 215 (White participants)) *Age: 27.0 (15.0) years (African-American participants); 19.0 (11.0) years (White participants); p = 0.0001 Male: 32% (African-American participants); 45% (White participants); p < 0.03 *Diabetes duration: 9.2 (7.0) years (African-American participants); 8.0 (6.4) years (White participants); p < 0.15	**DR** Photography	**DR** Proliferative: 17.5% (African-American); 10.2% (White participants)

Broe et al. 2014		
To investigate the long-term incidence of proliferative DR, and progression and regression of DR and associated risk factors in young Danish patients with type 1 diabetes Longitudinal cohort study Denmark; number of centres unclear Selection of participants from an earlier study. 16-year follow-up examination data in 2011 compared with participants' baseline 1995 data (the latter shown here). Mean age not reported for 2011 follow-up n 324 (n 185 (participants from baseline 1995 study); n 139 (non-participants from baseline 1995 study)) Baseline (1995) characteristics: *Age: 21.0 (3.3) years (participants from baseline 1995 study); 20.2 (3.2) years (non-participants from baseline 1995 study); $p < 0.03$ *Diabetes duration: 13.5 (3.3) years (participants from baseline 1995 study); 13.0 (2.9) years (non-participants from baseline 1995 study); $p = 0.22$	**DR** Photography **Nephropathy** Two consecutive overnight timed urine samples Microalbuminuria: AER 20 - 200 µg/min Macroalbuminuria: AER >200 µg/min	**DR** *Participants from 1995 study* - Non-proliferative: 61.2% (n 114) Proliferative: 0.5% (n 1) *Non-participants from 1995 study* - Non-proliferative: 51.8% (n 72) Proliferative: 0.7% (n 1) **Nephropathy** *Participants from 1995 study* - Albuminuria (mean AER > 20 µg/min): 10.5% (n 18) *Non-participants from 1995 study* - Albuminuria (mean AER > 20 µg/min): 14.8% (n 17) **HT** *Participants from 1995 study* - Antihypertensive treatment: 5.8% (n 10) *Non-participants from 1995 study* - Antihypertensive treatment: 6.9% (n 9)

Garg et al. 1997		
To determine the relationship between 24-hour ambulatory BP measurements and early renal disease Cross-sectional design U.S.A.; 1 eye/kidney clinic Data collection period unclear Consecutive sampling; inclusion criteria: subjects with type 1 diabetes who had completed the 24-hour ambulatory BP measurements, brought in two timed overnight urine specimens and who attended the clinic were included; exclusion criteria: subjects with a body-mass index greater than 120% of normal for their age and gender n 150 (n 86 (normal AER); n 29 (borderline AER elevation); n 24 (microalbuminuria); n 11 (macroalbuminuria)) *Age: 22.6 (3.3) years (normal AER 22.7 (0.5) years; borderline AER elevation 21.3 (0.6) years; microalbuminuria 23.0 (0.6) years; macroalbuminuria 24.3 (1.0) years) Male: 51.3% (normal AER 52.3%; borderline AER elevation 51.7%; microalbuminuria 45.8%; macroalbuminuria 54.6%) *Diabetes duration: 12.8 (5.0) years (range, 3.5 - 25.8) (normal AER 12.8 (0.6) years; borderline AER elevation 11.1 (0.8) years; microalbuminuria 13.7 (1.0) years; macroalbuminuria 15.0 (1.8) years)	**HT** Ambulatory BP measurements were taken by an oscillometric portable automatic monitor every 30 minutes from 6 a.m. to 10 p.m. and every hour from 10 p.m. to 6 a.m.; readings were downloaded. Office BPs were measured using the appropriate sized cuff and a sphygmomanometer after resting in sitting position for 5 minutes HT > 140/90 mmHg **Nephropathy** Overnight urine collections taken on nights with no evening exercise, alcohol or caffeine intake and when menses, pregnancy, or urinary tract infections were absent Borderline elevation: AER 7.6 - 20 µg/min Microalbuminuria: AER 20.1 - 200 µg/min Macroalbuminuria:	**HT** % 24-hour ambulatory BP measurements indicating - Systolic HT: borderline AER elevation 12.3% (2.8); microalbuminuria 6% (1.8); macroalbuminuia 40.2% (7.6); p < 0.0001 Diastolic HT: borderline AER elevation 11.1% (2.6); microalbuminuria 7.8% (1.5); macroalbuminuria 39.3% (8.8); p < 0.0001 % of ambulatory BP measurements > 90% percentile (mean of 24-hours) - Systolic: borderline AER elevation 48.3% (5.1); microalbuminuria 37.8% (4.9); macroalbuminuria 72.5% (8.4); p < 0.0002 Diastolic: borderline AER elevation 47.3% (4.3); microalbuminuria 40.5% (4.1); macroalbuminuria 64.9% (10.5), p < 0.002

	AER > 200 µg/min	
James et al. 2014		
To identify the prevalence and factors predictive of development of vascular complications in a cohort of young adults with type 1 diabetes Cross-sectional design; case note audit Australia; number unclear Data collected 2010 - 2011 Participants accessing Hunter New England Local Health District public health services, identified through clinic records, hospital attendances and other clinical records n 707 (n 682 (2010); n 707 (2011)) Ophthalmic examinations documented: n 95 (2010); n 85 (2011) ACR measurements documented: n 222 (2010); n 218 (2011) BP measurements documented: n 313 (2010); n 306 (2011) *Age: 23.0 (3.7) years Male: 54.3% *Diabetes duration: 10.2 (5.8) (range 0.2 - 28.3) years Aboriginal and/or Torres Strait Islander 5.6%; Rural participants 42.4%	**DR** Documented **Nephropathy** ≥ one reported ACR measurement above laboratory threshold normal value **HT** ≥ 130/80 mmHg per annum, and/or prescription of anti-hypertensive medication	**DR** *2010 -* Any: 13.7% *2011 -* Any: 9.4% **Nephropathy** *2010 -* ≥ one ACR measurement above laboratory threshold value: 15.1% *2011 -* ≥ one ACR measurement above laboratory threshold value: 16.1% ≥ two above threshold value: 12.4% **HT** *2010:* ≥ 130/80 mmHg: 33.9% *2011:* ≥ 130/80 mmHg: 30.7%

		Anti-hypertensive medication: 10.2% Any HT: 48.4%
Kullberg et al. 2002		
To investigate the prevalence and incidence of vascular complications in a population with type 1 diabetes from a well-defined geographical area Cross-sectional design; case note audit Sweden; number of centres unclear 1994 - 1995 Total n 390 (n 258 (age at diabetes onset 0 - 19 years); n 132 (age at diabetes onset 20 - 35 years)) Consecutive sampling from registers from local diabetes centres; inclusion criteria: type 1 diabetes; diagnosed < 36 years of age, during 1983 - 1987, and at the time of onset living within a defined geographical area - consecutive cases Grouped by age at diagnosis: A3 (10 - 14 years) n 75; A4 (15 - 19 years) n 46. *Age at recruitment/fundus photo: A3 21.9 (2.2) years; A4 27.2 (2.3) years Male: A3 56%; A4 61%	**DR** Photography **Nephropathy** Measured with the standard (unstated) method at each clinic **HT** > 140/90 mmHg or on anti-hypertensive medication(s)	**DR** Data not provided specific to target age group *Age at diabetes onset 0 - 19 years* - Microaneurysms: 23.3% > than microaneurysms: 3.9% *Age at diabetes onset 20 - 35 years* - Microaneurysms: 21.2% > than microaneurysms: 11.4% **Nephropathy** UAE > 20 mg/L: A3 14%; A4 13% **HT** Any HT: A3 9%; A4 9%

*Diabetes duration at fundus photo: A3 9.4 (1.8) years; A4 9.8 (1.6) years		
LeCaire et al. 2006		
To examine development of DR in a population-based cohort of persons with incident type 1 diabetes, to investigate the possibility of lowered DR prevalence and severity compared with previous U.S. studies Longitudinal cohort study U.S.A.; number of centres unclear Voluntary recruitment to cohort with inclusion criteria: type 1 diabetes diagnosed from May 1987 - April 1992; ≤ 30 years of age; living within defined area in Southern and Central Wisconsin n 474 (n 420 (4 years diabetes duration (T1)); n 275 (7 years diabetes duration (T2)); n 290 (9 years diabetes duration (T3)); n 68 (14 years diabetes duration (T4))) *Age: T1 14.1 (6.2) years (DR -); 19.5 (7.0) years (DR +) (P ≤ 0.0001). T2 16.1 (6.6) years (DR -); 19.5 (6.4) years (DR +) (P ≤ 0.01). T3 18.8 (7.2) years (DR -); 21.1 (6.4) years (DR +) (P ≤ 0.01). T4 22.2 (8.2) years (DR -); 24.8 (6.3) years (DR +) Male: T1 51% (DR -); 52% (DR +). T2 49% (DR -); 48% (DR +). T3 49% (DR -); 57% (DR +). T4 39% (DR -); 46% (DR +) Ethnicity (White) T1 96% (DR -); 96% (DR +). T2 96% (DR -); 90% (DR +). T3 99% (DR -); 95% (DR +). T4 100% (DR -); 98% (DR +)	**DR** Photography	**DR** Any: T1 6%; T2 23%; T3 47%; T4 73% Minimal non-proliferative: T1 5%; T2 18%; T3 33%; T4 44% Mild non-proliferative: T1 1%; T2 4%; T3 11%; T4 19% Moderate - severe non-proliferative: T1 0.2%; T2 0.4%; T3 2%; T4 10% Proliferative or treated: T1 0%; T2 0.4%; T3 0.3%; T4 0%

Olsen et al. 1999		
To estimate the prevalence of present glycaemic control and the prevalence of microvascular complications in a cohort of children and adolescents who had participated in 2 previous studies Longitudinal cohort study Denmark; 19 paediatric departments and five departments of internal medicine Selection of participants from two previous studies (1987 and 1989) Study n 339 (n 205 > 20 years of age of which n 190 assessed for DR, and n 192 assessed for nephropathy); Median age 21.1 years (range 12.0 - 26.9), male 53.1% and duration 13.2 years (8.9 - 24.5). n and characteristics of sample > 20 years not reported	**DR** Photography **Nephropathy** Two consecutive overnight timed urine samples. If AER was > 20 µg/min in one of the two samples a third sample was collected. The mean of 2 consistent AER samples was used in the analaysis Microalbuminuria: AER of 20 - 150 µg/min Macroalbuminuria: AER >150 µg/min	*Age > 20 years:* **DR** Minimal non-proliferative: 48.9% Moderate non-proliferative plus: 20% **Nephropathy** Microalbuminuria: 9.4% Macroalbuminuria: 4.7%
Olsen et al. 2004		
To determine the effect of the pre-pubertal duration of diabetes on early DR and elevated AER Longitudinal cohort study	**DR** Photography	**DR** Any: 57.6%

Denmark; 19 paediatric departments and six departments of internal medicine Selection of participants from an earlier study. Eight year follow-up data (1995 - 1996) n 353 (n 304 (Onset of diabetes < 12 years (pre-pubertal); n 49 (Onset of diabetes ≥ 12 years (pubertal/postpubertal)))); n 339 had urine samples taken *Age: 20.4 (3.2) years (Onset of diabetes < 12 (pre-pubertal)); 24.2 (1.3) years (Onset of diabetes ≥ 12 years (pubertal/post-pubertal)); p < 0.0001 Male: 51.3% (Onset of diabetes < 12 years (pre-pubertal)); 65.3% (Onset of diabetes ≥ 12 years (pubertal/post-pubertal)) *Duration: 13.8 (3.2) years (Onset of diabetes <12 years (pre-pubertal)); 10.7 (1.3) years (Onset of diabetes ≥ 12 years (pubertal/post-pubertal)); p < 0.0001)	**Nephropathy** Two out of three consecutive overnight timed urine samples Microalbuminuria: AER 20 - 150 µg/min Macroalbuminuria: AER >150 µg/min	**Nephropathy** AER > 20 µg/min: 12.7%
Raile et al. 2007		
To analyse the prevalence of nephropathy in a nationwide prospective survey Prospective cross-sectional design, documentation survey Germany and Austria; 262 centres Data collection period unclear but ceased February 2007	**Nephropathy** Measurement of ACR in a random spot collection, 24-hour collection with creatinine, or timed (e.g. overnight) collection. Microalbuminuria or macroalbuminuria was defined as at least two increased urine albumin	**Nephropathy** Microalbuminuria: 3.3% Macroalbuminuria: 0.2% End stage renal disease: 0.8%

Sample from German Diabetes Documentation System with inclusion criteria of at least 2 documented urine analyses; strategy unclear n 27,805 (n 26,644 (normal). n 919 (microalbuminuria); n 52/229 (macroalbuminuria/end stage renal disease) *Age at last visit: 21.1 (0.1) years (normal); 28.7 (0.6) years (microalbuminuria); 37.2 (1.2) years (macroalbuminuria/ end stage renal disease); $p < 0.0001$ Male: 52.6% (normal); 52.1% (microalbuminuria); 58% (macroalbuminuria/end stage renal disease) *Diabetes duration: 8.3 (0.05) years (normal); 12.6 (0.4) years (microalbuminuria); 20.1 (0.9) years (macroalbuminuria/ end stage renal disease); $p < 0.0001$	tests during the follow-up Microalbuminuria: AER 20 - 199 µg/min or an urinary albumin creatinine ≥ 2.5 mg/mmol Macroalbuminuria: AER ≥ 200 µg/min or an urinary albumin creatinine ≥ 35 mg/mmol	
Salardi et al. 2012		
To compare the effects of the pre-pubertal duration of diabetes on the occurrence of complications in two groups of patients after the same number with years of the disease Cross-sectional design Italy; 11 centres 2007 - 2009 Patients initially diagnosed and treated between 1981 - 1992, those who were aged 0 - 3 years and those who were in puberty or post-pubertal at the onset of type 1 diabetes; obtained from individual centres but	**DR** Photography	**DR** *Entire cohort* - Any after 20 years diabetes duration: 55% Mild after 20 years diabetes duration: 40% Moderate non-proliferative after 20 years diabetes duration: 9% Severe non-proliferative after 20 years diabetes duration: 4% Proliferative after 20 years diabetes duration: 2%

sampling strategy unclear n 105 (n 53 (very young pre-pubertal onset); n 52 (pubertal onset)); n 86 assessed for UAE; n 89 assessed for HT *Age: 22.0 (4.5) years (very young pre-pubertal onset); 31.6 (4.1) years (pubertal onset) Male: 43% (41.5% (very young pre-pubertal onset); 44.2% (pubertal onset)) *Diabetes duration: 19.7 (4.0) (range 15 - 28.5) years; n 69 (< 20 years); n 36 (≥ 20 years)		*Very young pre-pubertal-onset group* - Any: 40% Mild: 30% Moderate to severe: 10% Any < 20 years diabetes duration: 27% Any > 20 years diabetes duration: 88% *Pubertal onset group* - Any: 71% Mild: 52% Moderate to severe: 20% Any < 20 years diabetes duration: 63% Any > 20 years diabetes duration: 63%
	Nephropathy UAE or AER - Microalbuminuria: UAE 30 - 300 mg/day or AER ≥ 20 µg/min Macroalbuminuria: UAE > 300 mg day or AER > 150 µg/min	**Nephropathy** *Entire cohort* - Abnormal UAE: 7% *Very young pre-pubertal-onset group* - Abnormal UAE: 4% *Pubertal onset group* - Abnormal UAE: 9%
	HT BP was measured using a standard sphygmanometer with patients seated, and calculated as the mean of two measurements	**HT** *Entire cohort* - Any: 3% *Very young pre-pubertal-onset group* - Any: 0%

	HT: > 140/90 mmHg	*Pubertal onset group -* Any: 7%
Schwab et al. 2006		
To ascertain the type and prevalence rate, age and sex distribution of cardiovascular risk factors in type 1 diabetic patients up to 26 years of age Cross-sectional design, documentation survey Germany and Austria; 195 centres 2003 - 2004 Sampled consecutive cases from a joint-national register; inclusion criteria: type 1 diabetes. n 27,358 (n 25,184 assessed for raised systolic BP; n 25,178 assessed for raised diastolic BP; n 27,358 assessed for HT treatment) Cohort divided into pre-pubertal (0.25 - 11 years), pubertal (12 - 16 years) and young adulthood (17 - 26 years) based upon developmental stage Size of each cohort unclear *Age: 7.5 (2.5) years (pre-pubertal); 13.7 (1.4) years (pubertal); 18.5 (2.3) years (young adulthood) (P < 0.0001) Male: 51.7% (pre-pubertal); 51.7% (pubertal); 52.5% (young adulthood) (P value NS)	**HT** Use of a sphygmanometer. Median value calculated from at least three measurements HT: Average systolic or diastolic BP ≥ to the 95th percentile for age and sex. Values not provided for adults	**HT** Systolic: 8.1% Diastolic: 2.5% Raised systolic BP: 5.8% (pre-pubertal); 7.4% (pubertal); 11% (young adulthood); p < 0.0001 Raised diastolic BP: 3.9% (pre-pubertal); 3.2% (pubertal); 2.6% (young adulthood); p < 0.0001 Receiving anti-hypertensive medication: 2.1% (0.2% (pre-pubertal); 1.4% (pubertal); 4.8% (young adulthood)); p < 0.0001

*Diabetes duration: 2.5 (2.3) years (pre-pubertal); 4.9 (3.6) years (pubertal); 8.2 (4.8) years (young adulthood) ($P < 0.0001$)		

(ACR) Albumin-creatinine ratio (AER) Albumin excretion rate (BP) Blood pressure (DR) Diabetic retinopathy
(HT) Hypertension (n) Number (OR) Odds ratio (P) Probability (UAE) Urinary albumin excretion *Mean (SD)