Table 2.3 Major cohorts of patients exposed to radioiodine

Reference	Study	Type of study	Characteristics	Follow-up (years, mean), person–years of observation	Site, number of cancer cases, SIR or SMR (95% CI)
Diagnostic exposures					
Hall *et al*. (1996) Holm et al. (1991)	Diagnostic (Sweden)	Incidence	34 104; 80% women; age, 1–75	5–39 (24), 653 093	Thyroid: 67, 1.35 (1.05–1.71) diagnosed > 5 years after exposure Solid tumours: 964, 1.07 (1.01–1.14) only for tumours within 5 years of exposure
(Dickman *et al*., 2003)			36 792 (additional follow-up of Hall *et al*. cohort): 1767 – with previous external radiation therapy 11 015 – referred for suspicion of thyroid disease 24 010 – no external radiation therapy or suspicion	2–47, 886 618	Thyroid; 139 24, 9.83 (6.3, 14.6) 69, 3.48 (2.7,4.4) 36, 0.91 (0.6,1.3)
Treatment of hyperthyroidism					
(Saenger *et al*., 1968)	Hyperthyroid patients (US)	Incidence	22 0 000 treated with ^{131}I 14 000 surgery or antithyroid drugs only		Leukaemia – adjusted rate 17, 13/100,00 PY 16, 16/100 000 PY
Hall *et al*. (1992); Holm *et al*. (1991)	Hyperthyroid patients (Sweden)	Incidence/ mortality	10 552; 82% women; age, 13–74	1–33 (15), 139 018	*Incidence (Holm et al., 1991)* Stomach: 92, 1.05 (0.85–1.28) Kidney: 66, 1.39 (1.07–1.76) Brain: 48, 1.30 (0.96–1.72) Thyroid: 18, 1.29 (0.76–2.03) *Mortality (Hall et al., 1992)* Stomach: 54, 1.41 (1.06–1.85) Kidney: 15, 0.90 (0.51–1.49) Thyroid: 12, 1.95 (1.01–3.41)

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Ron *et al*. (1998)	Hyperthyroid patients (USA)	Mortality	20 949 iodine-exposed; 8 054 only iodine-exposed; 10 874 unexposed; 79% women; age, < 80	1–44 (21), 385 468 (iodine-exposed) 141 543 (only iodine-exposed)	*Iodine-exposed* Thyroid: 24, 3.94 (2.52–5.86) Lung: 295, 1.06 (NG) Breast: 248, 1.10 (NG) *Only iodine-exposed* Thyroid: 11, 4.91 (2.45–3.41)
Franklyn *et al*. (1999)	Hyperthyroid patients (United Kingdom)	Incidence/ mortality	7417; 83% women; age, 49– ≥ 70	1– ≥ 20, 72 073	Thyroid: Incidence: 9, 3.25 (1.69–6.25) Mortality: 5, 2.78 (1.16–6.67) Small bowel: Incidence: 6, 4.81 (2.16–10.7) Mortality: 6, 7.03 (3.16–15.7)
(Metso *et al*., 2007)	Hyperthyroid patients (Finland)	Incidence	2793 treated with radioactive iodine 2793 reference group		All cancer: 675, 1.25 (1.08–1.46) Stomach: 48, 1.75 (1.00–3.14) Kidney: 29, 2.32 (1.06–5.09) Breast: 124, 1.53 (1.07–2.19) Haematopoietic 40, no increase
Treatment of thyroid cancer					
Hall *et al*. (1991)	Thyroid cancer patients (Sweden)	Incidence	834 exposed[a], 1 121 unexposed; 75% women; age, 5–75	2–34 (14), 10 073 in the ^{131}I treated group; 15 757 in the untreated group	Exposed: Salivary glands: 3, 15.0 (3.09–43.8) leukaemia: genital organs: breast: Kidney: 7, 3.00 (1.21–6.19) Unexposed: Salivary glands: 0, 0 (0.00–12.7) Kidney: 5 1.48 (0.48–3.45)

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Reference	Study	Type of study	Characteristics	Follow-up (years, mean), person–years of observation	Site, number of cancer cases, SIR or SMR (95% CI)
de Vathaire *et al*. (1997)	Thyroid cancer patients (France)	Incidence	1771 patients: 846 received ^{131}I for therapy, 651 received ^{131}I for diagnosis; 274 unexposed; 79% women; age, 5–89	2–37 (10), 14 615	Colorectal, 1 771 patients 0–0.19 GBq[b]: 6 1.0 (reference category) > 0.19–3.7 1 1.4 (0.2–6.8)[c] > 3.7–7.5 GBq 4 4.0 (1.3–12.2) [c] > 7.5 GBq: 2 4.9 (1.2–18.5) [c]
(Rubino *et al*., 2003)	Thyroid cancer patients (combined analysis of French, Italian and Swedish cohorts)	Incidence	6841 patients::4225 received ^{131}I for therapy; 1 194 external beam therapy; 77% women; age 2–91	2–55 (13), 77 955	RR for ^{131}I vs none All cancers: 576, 1.2 (1.0–1.4) Leukaemia: 18, 2.5 (1.0–7.4) Salivary gland 19, 7.5 (1.2–743) Bone & soft tissue sarcoma 19, 4.0 (1.5–6.4) Female genital organs 57, 2.2 (1.3–3.9) CNS 21, 2.2 (0.9–5.7.) Breast 128, 0.8 (0.5–1.1) ERR per GBq of ^{131}I trend p-value Solid cancers 0.04 (0.009–0.07) < 0.01 Soft tissue & bone 0.61 (?–2.41) < 0.001 Colorectal cancer 0.10 (0.08–0.27) 0.03 Breast cancer –0.01(?–0.04) 0.6 Leukaemia 0.39 (?–1.54) 0.01
(Berthe *et al*., 2004)	Thyroid cancer patients (France)	Incidence	875 patients; 476 received ^{131}I for therapy; 7–87		Second primary cancers: 58 0–0.037 GBq of ^{131}I 1.00 0.037–3.7, 1.25 (0.53–2.97) 3.7–7.4, 1.00 (0.48–2.09) 7.4–14.8, 1.72 (0.79–3.73) > 14.8, 1.12 (0.50–2.76)

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Reference	Study	Type of study	Characteristics	Follow-up (years, mean), person–years of observation	Site, number of cancer cases, SIR or SMR (95% CI)
(Brown *et al*., 2008)	Thyroid cancer patients (US)	Incidence	30 278:10 257 received ^{131}I for therapy;18 029 received no radioisotopes	0.2–29.7(8.6), 310 258	All cancers 331, 1.2 (1.08–1.34) CNS 7, 2.01 (0.81–4.15) Breast 76, 1.21 (0.95–15.5) Stomach 12, 2.79 (1.44–4.87) Colon & rectum 27, 0.93 (0.62–1.35) Prostate 45, 1.41 (1.03–1.88) Leukaemia 19, 3.14 (1.89–4.91)

SIR, standardized incidence ratio; SMR, standardized mortality ratio; CI, confidence interval
[a] Individual doses based on iodine administered, 24-hour uptake
[b] Cumulative activity of ^{131}I (GBq) [10^9 Bq] administered 5 years or more before diagnosis of colorectal cancer
[c] 90% CI