Table 1: Literature evidenced on the role of SPECT/CT and SLN assessment in breast cancer.

Author/Source/Year No. patients (n) Type of study	Aims & Results
Giżewska, Nucl Med Commun. 2017 (1) n=153 Retrospective	*Comparison with planar* Detection rates: SPECT/CT: 77.7% (first echelon) 34.6% (second echelon LN)
Borrelli et al, Eur J Nucl Med Mol Imaging. 2017 (2) n=122 Retrospective	*Comparison with planar* Detection rates: SPECT/CT: 53.3% vs. planar: 43.4% Change in surgical approach: 21.3 % patients.
Zetterlund et al, Breast. 2016 (3) n=37 Prospective	SPECT/CT detection rates: 91.9% patients
Pouw et al, Eur J Surg Oncol. 2016 (4) n=284 Retrospective	SPECT/CT detection rates: 23.2% patients
Jimenez-Heffernan et al, J Nucl Med. 2015 (5) n=1,182 Retrospective	*Comparison with planar* Detection rate: SPECT/CT >planar Drainage basin mismatch: 16.5% Change in surgical approach: 17% patients.
Tomiguchi et al, Surg Today. 2016 (6) n=381 Retrospective	*Comparison with planar* SPECT/CT higher detection rate
Shima et al, Exp Ther Med. 2014 (7) n=92 Retrospective	SPECT/CT detects level II/III LNs that may be at risk of metastatic involvement
Kraft et al, Nucl Med Rev Cent East Eur. 2013 (8) n=320 Retrospective	*Comparison with planar* SPECT/CT: higher detection rate SPECT/CT: precise localization of all visualized SLNs
Yoneyama et al, Clin Nucl Med. 2014 (9) n=106 Prospective	*Comparison with planar* Detection rates: SPECT/CT: 100% vs. planar: 97.2%
Brouwer et al, Eur J Nucl Med Mol Imaging. 2012 (10) n=50 Prospective	*Comparison with planar* SPECT/CT detected significantly more SLNs (axillary, mammary, interpectoral)
Uren et al, Breast. 2012 (11) n=741 Retrospective	SPECT/CT detection of SLNs: in 1 single node field - 63%, in 2 fields - 36%, and only few in 3 & 4 fields

Coffey et al, Nucl Med Commun. 2010 (12) n=187 Retrospective	*Comparison with planar* SPECT/CT : higher detection rate SPECT/CT: precise localization of all visualized SLNs
Cheville et al, Breast Cancer Res Treat. 2009 (13) n=32 Prospective	*Comparison with planar* SPECT/CT characterized incidental findings & directed therapy to reduce long-term morbidity
vanDer Ploeg et al, Eur J Nucl Med Mol Imag. 2009 (14) n=15 Prospective	*Comparison with planar* SPECT/CT: detected lymphatic drainage in 53% additional patients SPECT/CT: detected axillary SLN in 15% patients with known extra-axillary SLNs on planar
Gallowitsch et al, Nuklearmedizin. 2007 (15) n=51 Prospective	*Comparison with planar* SPECT/CT: more accurate characterization of SLNs (size, depth, location).
Lerman et al, J Nucl Med. 2007 (16) n=220 Retrospective	*Comparison with planar; obese patients* Detection rates: Total population: SPCT/CT 91% vs. planar: 78% Obese patients: SPECT/CT: 89% vs. planar: 72%

LN - lymph node; SLN – sentinel lymph node

Table 2: Literature evidence on the role SPECT/CT in SLN assessment in melanoma.

Author/Source/Year **No. patients (n)** **Type of study**	**Aims & Results**
Trinh et al, Ann Surg Oncol. 2018 (17) n=118 Retrospective	**Melanoma in Head and Neck** *Comparison with planar* Detection rates: SPECT/CT: 100% vs. planar: 61.9% . Change in surgical approach: 81% patients
Doepker et al, Ann Surg Oncol. 2017 (18) n=351 Retrospective	*Comparison with planar* Detection rates: SPECT/CT: 89.6% vs. planar: 50.4%
Jimenez-Heffernan et al, J Nucl Med. 2015 (5) n=262 Retrospective	*Comparison with planar* Detection rates: SPECT/CT > planar Drainage basin mismatch: 11.1% patients Change in surgical approach: 37% patients
Stoffels et al, Eur J Nucl Med Mol Imaging. 2014 (19) n=464 Retrospective	*Comparison with planar* Median cost of SLN procedure: SPECT/CT: 1,619.7 € vs. planar: 2,330.2 €; Cost savings by SPECT/CT 30.5 %
Zender et al, Am J Otolaryngol. 2014 (20) n=14 Retrospective	SPECT/CT change in management: 57% patients.
Kraft et al, Nucl Med Rev Cent East Eur. 2013 (8) n=161 Retrospective	*Comparison with planar* SPECT/CT: significantly higher detection rate SPECT/CT: precise localization of all visualized SLNs.
Fairbairn et al, J Plast Reconstr Aesthet Surg. 2013 (21) n=32 Retrospective	*Comparison with planar* Similar diagnostic accuracy Change in surgical approach: > 30% patients
Vuthaluru et al, Am J Ophthalmol. 2013 (22) n=12 Prospective	*Melanoma in eyelid* SPECT/CT accurately localization of SLNs: 11/12 patients
Stoffels et al, JAMA. 2012 (23) n=464 Retrospective	*Comparison with planar* Detection rates: SPECT/CT > planar Local relapse rate: SPECT/CT cohort 6.8% vs. standard cohort 23.8% 4-year DFS: SPECT/CT 93.9% vs planar 79.2%
Kraft et al, Nucl Med Rev Cent East Eur. 2012 (24) n=113 Retrospective	*Comparison with planar* Detection rates: SPECT/CT: 94.7% vs. planar: 88.5%

Veenstra et al, Ann Surg Oncol. 2012 (25) n=631 Retrospective	*Melanoma in upper limb or trunk* SPECT/CT detected lymphatic drainage to cervical basins, mainly IV and Vb.
Veenstra et al, Ann Surg Oncol. 2012 (26) n=35 Prospective	*Comparison with planar* Similar detection rates SPECT/CT: localization & change in surgical approach: >30% patients
Nielsen et al, Eur J Nucl Med Mol Imaging. 2011 (27) n=307 Retrospective	*Comparison with planar* SPECT/CT detection rate: additional 10% patients
Klode et al, J Eur Acad Dermatol Venereol 2011 (28) n=48 Retrospective	*Melanoma in Head & Neck* *Comparison with planar* SPECT/CT: better postoperative aesthetic results, lower morbidity; significantly shorter operating time with subsequent reduced costs
Vermeeren et al, Head Neck. 2011 (29) n=38 Retrospective	*Melanoma in Head & Neck* SPECT/CT detection rate: additional LNs in 16% patients Change in surgical approach: >35% patients
van der Ploeg et al, Ann Surg Oncol. 2009 (30) n=50 Retrospective	Most (involved) SLNs located in infero-medial & central zones High frequency of pelvic second-tier nodes - need for deep groin dissection in most patients with positive SLNs.
van der Ploeg, Ann Surg Oncol. 2009 (31) n=85 Retrospective	*Comparison with planar* Detection rates: SPECT/CT > planar Change in surgical approach in 35% patients; questionable value in 22% & no value in 42% patients
Ishihara et al, Int J Clin Oncol. 2006 (32) n=35 Retrospective	*Comparison with blue dye* SPECT/CT: higher detection rates in neck area
Even-Sapir et al, J Nucl Med. 2003 (33) n=34 Prospective	*Comparison with planar* SPECT/CT: higher detection rates

SLN – sentinel lymph node
DFS – disease free survival

Table 3: Literature evidence on the role of pre-ablation diagnostic SPECT/CT in differentiated thyroid cancer

Author/Source/Year **No. patients (9)** **Type of study**	**Results**
Avram et al, J Clin Endocr Metab, 2015 (34) n=220 Prospective	SPECT/CT (combined with stimulated serum thyroglobulin) • Change in risk stratification: 15% patients • Change in intended management: 31% patients
Agrawal K et al, Ind J Nucl Med, 2015 (35) n=83 Prospective	SPECT/CT: • Detection of additional metastases: cervical nodes 29% & distant location 10% patients • Change in TNM stage: 9.6% patients • Change in risk stratification: 13.2% patients • Change in intended management: 38.5% patients
Avram et al, J Clin Endocr Metab, 2013 (36) n=320 Prospective	SPECT/CT: • Detection of additional cervical metastases: 38% patients under 45y & 24% patients over 45y of age • Detection of additional distant metsastases: 4% patients under 45y & 10% patients over 45y of age
Wong et al, Am J Roentgenol, 2010 (37) n=48 Retrospective	SPECT/CT: • Additional findings: 40% patients • Change in post-surgical stage: 21% patients • Change in intended management (RAI therapy dose):58% patients

RAI – radioactive Iodine

Table 4: Literature evidence on the role of SPECT/CT after radioiodine treatment for ablation or for recurrent/metastatic differentiated thyroid cancer

Author/Source/Year **No. patients (n)** **Type of study**	**Results**
Hassan et al, Europ Thyroid, 2015 (38) n=67 (ablation 29; therapy 38) Retrospective	SPECT/CT: • Reduced number of equivocal foci from 17 to 1 • Change in stage: 20.8% patients • Change in management: 14% patients
Grewal et al, J Nucl Med, 2010 (39) n=148 (ablation 109; therapy 39) Retrospective	SPECT/CT: • reduced number of equivocal foci by 70% • spared further CT/MR: 6.6% patients • change in risk stratification: 6.4% patients post-ablation • similar performance post-ablation & post-therapy.
Kohlfuerst et al, Eur J Nucl Med Mol Imag, 2009 (40) n=53 (ablation 23; therapy 18) Prospective	SPECT/CT: • Unexpected lesions: 28.9% • Overall diagnostic impact: 63.6% patients • Change in N status: 36.4% patients • Change in M status: 21.1% patients • Change in management: 24.4% patients
Spanu et al, J Nucl Med, 2009 (41) n=117 (ablation 108; therapy 9) Prospective	SPECT/CT: • Overall diagnostic impact: 67.8% patients • Change in management: 35.6% patients • Sparing unnecessary imaging/treatment: 20.3% patients.
Wang et al, Clin Imaging, 2009 (42) n=94 (not specified)	SPECT/CT: • Better localization of uptake: 21% patients • Overall diagnostic impact: 12.8% patients • Change in management: 23.4% patients
Wong et al, Am J Roentgenol, 2008 (43) n=56 (ablation 52; therapy 4) Retrospective	SPECT/CT: • diagnostic impact: cervical nodes 40.8% & distant foci 100% • increase in diagnostic confidence in 70.7% lesions
Tharp et al, Eur J Nucl Med Mol Imag, 2004 (44) n=71 (not specified) Retrospective	SPECT/CT: • diagnostic value: 57% patients (including 27% patients with equivocal cervical uptake & 13% patients with distant foci)

Table 5: Literature evidence on the role of SPECT/CT in Neuroendocrine Neoplasms

Author/Source/Year **No. patients (n)** **Tracer & Type of tumor** **Type of stud,**	**Aims & Results**
Kunikowska et al, Clin Nucl Med 2017 (45) n=68 99mTc-HYNICTOC, NET Retrospective	*Comparison with Ga-DOTATATE PET/CT:* SPECT/CT : sensitivity: 82% , specificity 69 %, PPV 92%, NPV 47%, accuracy 79% PET/CT: sensitivity 100%, specificity: 85%, PPV: 97%, NPV: 100%, accuracy: 97% Detection rate: SPECT/CT < PET/CT
Trogrlic et al, Nuklearmedizin. 2017 (46) n=65 99mTc-HYNICTOC, NET Retrospective,	*Comparison with planar+ SPECT:* SPECT/CT: Sensitivity 88.9, specificity 79.3, Accuracy: SPECT/CT 88.9% vs SPECT 73.8% SPECT/CT: change in management 16.9%
Etchebehere et al, J Nucl Med. 2014 (47) n=19 99mTc-HYNICTOC, GEP Prospective	*Comparison Ga-DOTATATE PET/CT & MR:* Sensitivity: 60% SPECT/CT, 96% PET/CT, 72% MR Specificity: 99% SPECT/CT, 97% PET/CT, 100% MR PPV: 96% SPECT/CT, 94% PET/CT, 100% MR NPV: 83% SPECT/CT, 98% PET/CT, 88% MR Accuracy: 86% SPECT/CT, 97% PET/CT, 91% MR
Spanu et al, Am J Nucl Med Mol Imaging. 2017 (48) n=104 111In-pentetreotide, GEP Retrospective	*Comparison with CI:* Sensitivity: 91.4% SPECT/CT vs 71.4% CI Accuracy: 94.2% SPECT/CT vs 80.8% CI Change in management: 27.9% SPECT/CT vs 9.6% CI
Ait et al, Nucl Med Commun. 2017 (49) n=13 111In-pentetreotide, Tumour of pancreas Retrospective	Comparison with planar: SPECT/CT: better localization & quantification
Ruf et al, J Nucl Med. 2016 (50) n=31 111In-pentetreotide, GEP Prospective	*Diagnostic SPECT/CT; Comparison with CT:* Detection rate: dSPECT/CT 78-89% vs. CT 63-85% dSPECT/CT change in management 25.8% patients
Lee et al, Nucl Med Mol Imaging. 2015 (51) n=13 111In-pentetreotide, NET Prospective	*Comparison with Ga-DOTATATE PET/CT:* Sensitivity: 54% SPECT/CT vs. 100% PET/CT

Chiaravalloti et al, Anticancer Res. 2015 (52) n=81 111In-pentetreotide , Lung carcinoid Prospective	*Comparison with ceCT:* Primary/local recurrence Sensitivity 96% SPECT/CT vs. 87.5% CT Specificity 92% SPECT/CT vs. 97% CT Distant mets: Sensitivity 85.5% SPECT/CT vs. 75.2% CT Specificity 84.6% SPECT/CT vs. 90.5% CT
Sainz-Esteban et al, Nucl Med Commun. 2015 (53) n=107 111In-pentetreotide, NET Retrospective	*Comparison with planar*: Detection rate: 94.4% SPECT/CT vs 65.6% planar SPECT/CT: 87.8% sensitivity,96.6% specificity Change management in 11% patients
Schreiter et al, Radiol Oncol. 2014 (54) n=123 111In-pentetreotide, NET Retrospective	*Comparison with Ga-DOTATATE PET/CT:* PET/CT is better than SPECT/CT
Wong et al, Acad Radiol. 2010 (43) n=49 111In-pentetreotide, GEP Prospective	*Comparison with planar:* SPECT/CT improved lesion localization: 61.8% SPECT/CT changed lesion classification: 28.1% SPECT/CT diagnostic value: 28.6%
Apostolova et al , Ann Nucl Med. 2010 (55) n=25 111In-pentetreotide, NET Prospective	Comparison with planar: up-staging 18% lesions & down-staging 12% lesions
Castaldi et al, Radiol Med. 2008 (56) n=54 111In-pentetreotide, NET Retrospective	*Comparison with planar:* Change in management: 26% patients
Perri et al, Q J Nucl Med Mol Imaging. 2008 (57) n=81 111In-pentetreotide, NET Retrospective	*Comparison with SPECT:* Detection rate: Patient analysis: 92.6% SPECT/CT vs. 79% SPECT Lesion analysis 96.4% SPECT/CT vs. 81.1% SPECT
Hillel et al, Clin Radiol. 2006 (58) n=29 111In-pentetreotide, NET Prospective	Comparison with planar: Change in management: 64% patients
Krausz et al, Clin Endocrinol 2003 (59) n=71 111In-pentetreotide, NET (n=67) & MTC (n=4) Retrospective	*Comparison with planar:* Change in diagnosis: 32% patients Change in management: 14% patients
Chang et al, Cancer Imaging. 2016 (60) n=23 123I-mIBG, Pheochromocytoma	*Comparison with Ga-DOTATATE PET/CT:* Similar performance

Prospective	
Kroiss et al, Ann Nucl Med. 2017 (61) (n=10) 123I-mIBG, Pheochromocytoma Prospective	*Comparison with 18F-DOPA PET/CT:* Detection rates: 20.0% SPECT/CT vs. 100% PET/CT Sensitivity: 11.1% SPECT/CT vs. 69.2% PET/CT
Nakamoto et al, Clin Nucl Med. 2016 (62) (n=68) 123I-mIBG, Pheochromocytoma Prospective	SPECT/CT quantification
Kroiss, Eur J Nucl Med Mol Imaging. 2015 (63) (10) 123I-mIBG, Pheochromocytoma Prospective	*Comparison with Ga-DOTATATE PET/CT:* Detection rate: 20.0% SPECT/CT vs.100% PET/CT Sensitivity: 6.9% SPECT/CT vs. 100% PET/CT
Derlin et al, Clin Nucl Med. 2013 (64) (n=22) 123I-mIBG, Pheochromocytoma Prospective	*Comparison with MRI:* SPECT/CT: sensitivity 87.5%, specificity 93.8%, accuracy 92.5% MRI: sensitivity 87.5%, specificity 96.9%, accuracy 95%. SPECT/MRI fusion superior to both SPECT/CT and MRI (sensitivity 100%)
Fukuoka et al, Clin Nucl Med. 2011 (65) (n=16) 123I-mIBG and 131I-mIBG (post-therapy), Pheochromocytoma Prospective	*Comparison with planar:* Detection rate – lesion-based analysis: -123I-mIBG SPECT/CT: additional 20% -131I-mIBG SPECT/CT: additional 5% Additional diagnostic information: -123I-mIBG SPECT/CT: 81% studies -131I-mIBG SPECT/CT: 53% studies
Meyer-Rochow et al, Ann Surg Oncol. 2010 (66) (n=22) 123I-mIBG, Pheochromocytoma Prospective	Additional information from SPECT+CT (correlative imaging) : 6 patients

NET – neuroendocrine tumour; GEP – Gastro-entero-pancreatic tumour;
PPV – positive predictive value; NPV – negative predictive value
CI – conventional imaging; CeCT – contrast enhanced CT

Table 6: Literature evidence on the performance indices of bone SPECT/CT in cancer patients.

Author/Source/Year **No. patients (n)** **Gold standard**	**Sensitivity (%)**	**Specificity (%)**	**Significance** **(p < 0.05)**
Zhao et al, Skel Radiol, 2010. (67) n=125 Biopsy & radiological follow-up	SPECT 82.5 SPECT/CT 66.7	SPECT 66.7 SPECT/CT 98.4	Specificity & accuracy
Palmedo et al, Eur J Nucl Med Mol Imag, 2014. (68) n= 308 Clinical follow-up	WBS 93 SPECT 94 SPECT/CT 97	WBS 78 SPECT 71 SPECT/CT 94	Specificity
Zhang et al, Nuklearmedizin, 2015 (69) n= 65 Pathology & clinical follow-up	SPECT 70.9 SPECT/CT 100	SPECT 94.9 SPECT/CT 97.4	NA
Haraldsen et al, Clin Physiol Funct Imag, 2016. (70) n=73 MRI	WBS 87 SPECT 87 SPECT/ ldCT 79 SPECT/ dCT 84	WBS 63 SPECT 71 SPECT/ ldCT 63 SPECT/ dCT 83	Specificity
Jambor et al, Acta Oncol 2016. (71) n= 53 consensus reading & clinical and imaging follow-up	WBS 62 SPECT 74 SPECT/CT 85 F-18-PET 93 wbMRI+DWI 91	WBS 50 SPECT 44 SPECT/CT 5 F-18-PET 6 wbMRI+DWI 4	Accuary of F-18-PET & wbMRI+DWI > WBS, SPECT & SPECT/CT
Fonager et al, Am J Nucl Med Mol Imag, 2017. (72) n= 37 Clinical & imaging follow-up	WBS 78 SPECT/CT 89 F-18-PET/CT 89	WBS 90 SPECT/CT 100 F-18-PET/CT 90	NS
Mahaletchumy et al, World J Nucl Med, 2017. (73) n= 85 Correlative imaging & clinical follow-up	WBS 43 SPECT 58 SPECT/CT 78	WBS 85 SPECT 92 SPECT/CT 94	NA

WBS – whole body planar bone scan
NA – not available
DWI – diffusion weighed imaging

Table 7: Literature evidence on the role of SPECT/CT for planning or assessment of trans-arterial radioembolization (TARE)

Author/Source/Year **No. patients (n)** **Type of study**	**Aims & Results**
Dittmann et al, J Nucl Med. 2018 (74) n=50 Prospective	*Comparison with planar*. SPECT/CT: significantly lower hepatopulmonary shunts, substantial shunting in 4% cases (vs. 20% for planar).
Yue et al, Med Phys. 2016 (75) n=15 Prospective	*Comparison with PET/CT.* Congruent results of 90Y Bremsstrahlung SPECT/CT and 90Y PET/CT in all cases
Erxleben et al, Acta Radiol. 2016 (76) n=316 Retrospective	*Comparison with planar.* SPECT/CT: significantly lower hepatopulmonary shunts
Theysohn et al, PLoS One. 2015 (77) n=852 Retrospective	*Comparison with planar.* SPECT/CT: unexpected extrahepatic uptake: 6.5% patients
Gates et al, J Nucl Med. 2015 (78) n=174 Retrospective	*Comparison with planar.* SPECT/CT: additional shunts identification
Ilhan et al, J Nucl Med. 2015 (79) n=502 Retrospective	Wide variation of uptake among liver metastases subtypes
Spreafico et al, Cardiovasc Intervent Radiol. 2015 (80) n=100 Retrospective	*Comparison with planar.* SPECT/CT: identifies accessory branches in 19 lesions/17 patients, thus changing the embolization procedure
van den Hoven et al, Cardiovasc Intervent Radiol. 2014 (81) n=110 Retrospective	SPECT/CT identified aberrant hepatic arteries: 34% patients
Zade et al, Nucl Med Commun. 2013 (82) n=35 Prospective	*Comparison with PET/CT.* Congruent results of 90Y Bremsstrahlung SPECT/CT and ^{90}Y PET/CT: 97.14% cases
Padia et al, J Vasc Interv Radiol. 2013 (83) n=13 Prospective	*Comparison with PET/CT.* ^{90}Y PET/CT: higher spatial resolution & lower scatter

Burgmans et al, Eur J Radiol. 2012 (84) n=79 Retrospective	*Comparison with planar.* Detection rate of hepatic falciform artery: SPECT/CT: 13.3% vs. digital subtraction angiography: 11.9% vs. CT arteriography: 52.3%
Ahmadzadehfar et al, Eur J Nucl Med Mol Imaging. 2012 (85) n=188 Retrospective	*Comparison with planar.* Prediction of GI ulcers: SPECT/CT sensitivity 87%, specificity 100%, PPV 100%, NPV 99%, accuracy 99%
Lauenstein et al, Rofo. 2011 (86) n=27 Prospective	*Comparison with planar.* SPECT/CT only detected perfusion of occluded liver segment: 59% patients
Hamami et al, J Nucl Med. 2009 (87) n=58 Prospective	*Comparison with planar+SPECT.* Detection of GI shunting: SPECT + CT fusion: sensitivity 100%, specificity 94%, accuracy 96%
Denecke et al, Eur Radiol. 2008 (88) n=22 Prospective	*Comparison with SPECT.* Detection of GI shunting: SPECT/CT 31% vs. SPECT 15% patients

GI - gastrointestinal
PPV – positive predictive value; NPV – negative predictive value

Table 8: Literature evidence on the role of bone SPECT/CT in benign bone conditions.

Author/Source/Year **No. patients (n)** **Reason for study, Anatomical region** **Type of study**	**Aim & Results**
Russo VM et al, World Neurosurg, 2017 (89) n=99 LBP, SPECT/CT of spine Prospective	*Compare SPECT/CT patterns with CT joint degeneration & Modic changes and MRI disc abnormalities* SPECT/CT: localization of active facet joints, better LBP management SPECT/CT patterns: no correlation with degree of CT degeneration >40% SPECT/CT uptake: high agreement with Modic changes
Hudyana et al, Eur J Nucl Med Mol Imag, 2016 (90) n=48 s/a lumbar arthroscopy with screw insertion, SPECT/CT of spine Retrospective	*Accuracy for diagnosis of loosening of fixation material in back pain after surgery* High sensitivity & specificity for exclusion of screw loosening SPECT/CT identified other causes of recurrent LBP
Sumer J et al, Nucl Med Comm, 2013 (91) n=37 s/a lumber fusión surgery; SPECT/CT of spine Retrospective study	*Value in LBP after surgery, compared to planar+SPECT* SPECT/CT: significantly higher accuracy; procedure of choice
Ha S et al 2015 (92) n=50 Feet pain, SPECT/CT of feet & ankle Retrospective	*Diagnostic performance with regard to lesion type, compared to MRI* SPECT/CT & MRI: comparable diagnostic performance SPECT/CT & MRI: complementary techniques
Chicklore S et al, Nucl Med Comm, 2013 (93) n=209 Feet pain; SPECT/CT of feet & ankle Retrospective	*Diagnostic accuracy for impingement syndrome & ST pathology; compared to MRI & US* SPECT/CT similar performance
Huellner MW et al, PLoS One, 2013 (94) n=32 Wrist pain; SPECT/CT of hands & wrists Retrospective	*Diagnostic accuracy & interobserver agreement compared to MRI, CT, X-rays, planar BS* SPECT/CT: most helpful modality MRI: better characterization of lesion type Good interobserver agreement (accuracy, localization, etiology)
Schleich FS et al, Eur J Nucl Med Res, 2012 (95) n=51 Wrist pain; SPECT/CT of hands & wrists Retrospective	*Diagnostic, therapeutic impact: compared to X-rays & planar BS* SPECT/CT: highest lesion detectability; impact on patient management
Dobrindt O et al, BMC Med Imaging, 2015, (96) n=50 Painful THR & TKR; SPECT/CT of hips or knees Retrospective	*Compared to 3-phase BS + SPECT* SPECT/CT: higher diagnostic accuracy in (a)septic loosening
Chew CG et al, Annals Nucl Med, 2010, (97) n=117 Patello-femoral disorders; SPECT/CT of knees	*SPECT/CT arthrography for evaluation of mechanical loosening of prostheses.*

Retrospective	SPECT/CT of hip: better for acetabular cup but not for femoral stem. SPECT/CT of knee: better in femoral and tibial component
Slevin O et al, 2017 (98) n=104 Patellofemoral disorders; SPECT/CT of knees Retrospective	*Tracer distribution patterns in patellar resurfacing* SPECT/CT of value for evaluation of patello-femoral disorders after TKA

LBP – Low back pain
THR – Total hip replacement
TKR – Total knee replacement
TKA – Total knee arthroplasty
ST – soft tissues
BS – bone scan

Table 9: Literature evidence on the role of SPECT/CT in musculo-skeletal infections.

Author/Source/Year **No. patients (n)** **Tracer, Clinical indication** **Type of study**	**Aims & Results**
Horger et al, EJNM 2003 (99) (n=27) Post-traumatic OM, 99mTc-AGA	*Compared to BS::* Specificity: SPECT/CT 89% vs. SPECT 78% Same sensitivity 100%. SPECT/CT: better diagnostic accuracy to differentiate OM from STI
Filippi et al, JNM 2006; (100) n=28 OM/infected joint prosthesis, 99mTc-WBC Prospective	SPECT/CT: accurate localization of all positive foci. SPECT/CT: improved diagnosis 36% patients (ST vs. bone; complicated bone after trauma; synovial infection without prosthesis involvement)
Bar-Shalom et al, JNM 2006 (101) n=32, Ga-67 (n=21); In-WBC (n=11) Mixed population Retrospective	*Compared to planar + SPECT:* SPECT/CT: role in diagnosis, localization, extent of disease SPECT/CT contribution: WBC > Ga
Horger et al, Arch Orth Surg 2007 (102) n=31 Mixed population, 99mTc-HEDP Prospective	*Compared to 3-phase planar + SPECT:* Specificity SPECT/CT 86%; vs. BS 50%; Same sensitivity 78%. SPECT/CT avoids false positives & equivocal findings
Sathekge et al, Annals Nucl Med 2018 (103) n=184 OM vs. STI, 99mTc-Ubi	*Compared to planar + SPECT:* SPECT/CT sensitivity 99%, specificity 95%, PPV 93%, NPV 99%, accuracy 95% SPECT/CT: improved diagnostic confidence in 49% patients; better interobserver agreement
Djekidel et al, Clin Nucl Med 2011 (104) n=43 Mixed population, In111- & Tc99m-WBCs Retrospective	*Compared to planar + SPECT:* SPECT/CT: sensitivity 88%, specificity 85%, PPV 84%, NPV 89%. Increase in correct lesion location. Improved overall reader confidence. No difference between 111In- & 99mTc-WBCs SPECT/CT No difference before & after treatment
Filippi et al, JNM 2009 (105) n=17 Diabetic Foot, 99mTc-WBC	Compared to 3-phase BS: SPECT/CT change in interpretation: 53% patients SPECT/CT did not contribute in negative scan
Heiba et al, J Foot Ankle Surg 2010 (106) n=213 Diabetic foot, 99mTc-MDP & 111In WBC	DI - 2 steps: BS/WBCs-SPECT/CT ± WBCs/Bone marrow SPECT/CT Diagnostic accuracy: DI > WBCs/BS; DI SPECT/CT > DI planar/SPECT only. DI SPECT/CT: improves detection & discrimination of STI vs. OM

Erdman et al, Diab Care 2012 (107) n=77 Diabetic foot, 99mTc-WBC Retrospective	*SPECT/CT based CSI:* Favorable outcome: CSI 0 = 92% ; CSI ≥7 = 25% SPECT/CT: visual < CSI for predicting outcome
Aslangul et al, Diab Care 2013 (108) n=55 Diabetic foot, Ga-67 Prospective	*Diagnosis of OMs & treatment tailoring; combined with biopsy:* SPECT/CT + biopsy: sensitivity 88%; specificity 94%, PPV 92%, NPV 91% SPECT/CT + biopsy: spared antibiotics 55% cases
Heiba et al, NM Comm 2013 (109) n=227 Diabetic foot, 99mTc-MDP & 111In WBC Retrospective	*Compared to CI in different population: SPECT/CT (n=232) & CI (n=227)* DI SPECT/CT: more accurate diagnosis of OM, STI, other bony pathology DI SPECT/CT: associated with shorter hospitalization length
Vouillarmet et al, Diab Med 2014 (110) n=22 Diabetic foot, 99mTc-WBC Retrospective	*Monitoring treatment response; compared to 3-phase BS & X-rays)* Prediction of OM relapse after antibiotics: SPECT/CT: sensitivity 100%, specificity 92%, PPV 72%, NPV 100% Better than X-rays & BS Negative WBC-SPECT/CT useful in guiding therapy.
La Fontaine et al, Wound 2016 (111) n=110 Diabetic foot, 99mTc-WBC Retrospective	*Compared to MRI in different population: SPECT/CT (n=52) & MRI (n=58)* SPECT/CT: sensitivity 89%, specificity 35%, PPV 74%, NPV 60% vs. MRI: sensitivity 87%, specificity 37%, PPV 74%, NPV 58% (p NS)
Lazaga et al, Int Wound J 2016 (112) n=20 Diabetic foot, 99mTc-WBC Retrospective	*Monitoring response to treatment* SPECT/CT: sensitivity 90%, specificity 56%, PPV 69%, NPV 83%. Useful to determine treatment outcomes
Vouillarmet et al, Diabetologia 2017 (113) n=45 Diabetic foot, 99mTc-WBC Retrospective	*Monitoring response to treatment (at 6 & 12 weeks)* SPECT/CT (12 weeks): sensitivity 100%, specificity 56%, PPV 46%, NPV 100%. SPECT/CT predicted remission at end of treatment.
Fuster et al, Clin Nucl Med 2012 (114) n=34 Spondylodiskitis, 67Ga Prospective	*Compared to BS & FDG-PET/CT* BS & Ga-67 SPECT/CT: sensitivity 78%, specificity 81%, PPV 82%, NPV 76%, accuracy 79%. FDG-PET/CT better performance, concordance with SPECT/CT
Tamm et al, Can Assoc Radiol J (115) n=34 Spondylodiskitis , 99mTc-MDP and/or 67Ga Retrospective	*Compared to BS & MRI* BS & Ga-67 SPECT/CT vs. MRI: same sensitivity (91%), specificity and PPV (100%); similar NPV (94% vs. 80%) and accuracy (97% vs 95%)
Lazzeri et al, Clin Nucl Med 2010 (116) n=72 Spondylodiskitis, 111In-Biotin	*Early diagnosis; compared to planar & SPECT* SPECT/CT vs. SPECT: similar sensitivity (94% vs. 92), same specificity (92%).

Prospective	SPECT/CT correctly localized infection to bone, ST or both: 22% cases
Chakraborty et al, Ind JNM 2013 (117) n=20 OM of base of skull, 99mTc-MDP Retrospective	*Compared to 3-phase BS* SPECT/CT localized lesions to specific bone in 50% & showed destructive changes in 25%
Sharma et al, Jpn J Radiol 2013 (118) n=13 OM of base of skull, 99mTc-MDP Retrospective	*Compared to planar, SPECT & CT* AUC for SPECT/CT 0.977 vs. SPECT 0.909, CT 0.886, planar 0.614 Accuracy SPECT/CT 92%, SPECT 85%, CT 77%, planar 46%
Bolouri et al, EJNMMI 2013, (119) n=42 OM of jaw, 99mTc-MDP	*Compared to SPECT & orthopantomography (OPT)* SPECT/CT sensitivity 100%, specificity 86%, accuracy 98 % SPECT: 100%, 71%, 95%; CT 77%, 86%, 79%; OPT 59%, 100%, 66 % SPECT/CT most useful but not cost justified
Graute et al, EJNMMI 2010 (120) n=31 Low grade joint infection, 99mTc-AGA Retrospective	*Compared to 3-phase planar* SPECT/CT: sensitivity 89%, specificity 73%, PPV 57%, NPV 94% SPECT/CT improvement in diagnosis, localization & extent
Kim et al, J Comput Assit Tomogr 2014 (121) n=164 Infected hip & knee prostheses, 99mTc-WBC Retrospective	*Compared to 2-phase BS* SPECT/CT: sensitivity 93%, specificity 93%, PPV 94%, NPV 92%, accuracy 93%. Higher impact of SPECT/CT on sensitivity & specificity for hip vs. knee prosthesis infections.

OM – osteomyelitis
ST – soft tissue
STI – ST infection
PPV – positive predictive value; NPV – negative predictive value
CI – conventional imaging
DI – dual isotope
CSI - Composite Severity Index CSI
OPT - orthopantomography

Table 10: Literature evidence on the role of SPECT/CT in soft tissue and visceral infections

Author/Source/Year **No. patients (n)** **Tracer, Clinical indication** **Type of study**	**Aims & Results**
Bar-Shalom et al, J Nucl Med 2006 (101) n=50 FUO; mixed STI (67Ga n=26); VGI (111In-WBC n=24) Retrospective	*Compared to SPECT* SPECT/CT: diagnosis & localization in 48% & extent in 43% patients Excluded infection in 4 sites (67Ga bowel uptake) Contribution: 111In-WBC > 67Ga
Lou et al, Nucl Med Comm 2010 (122) n=11 99mTc-WBC; VGI Retrospective	SPECT/CT: high accuracy in clinically suspected cases
Khaja, Clin Imag 2013 (123) n=20 111In- WBC; VGI Retrospective	*Compared to CTA & Software fusion* Sensitivity, specificity, accuracy, PPV, NPV: WBC: 75/100/80/100/50% CTA: 88/50/80/88/50% SPECT/CTA fusion: 94/50/85/88/67% Software fusion: better diagnostic confidence; impact on outcome
Erba et al, Eur J Nucl Med Mol Imag 2014 (124) n=55 99mTc-WBC; Late & low grade VGI Prospective	*Compared to SPECT:* SPECT/CT vs. SPECT: sensitivity 100% vs. 85%; specificity 100 % vs. 63% SPECT/CT decreased FPs in 37% patients
Erba et al, J Nucl Med 2012 (125) n=131 99mTc-WBC; IE Prospective	Compared to echo SPECT/CT sensitivity 90%, NPV 94%, specificity & PPV 100% Main value in negative or difficult-to-interpret echo
Lauridsen et al, Int J Cadiovasc Imag 2017 (126) n=55 99mTc-WBC; extracardiac sites of IE	*Compared to FDG* Clinical utility score: FDG-PET/CT > WBC-SPECT/CT
Litzler et al, J Nucl Med 2010 (127) n=13 99mTc-WBC; Infected CIED	*Monitoring response to antibiotic treatment* SPECT/CT: extent & precise location of infection SPECT/CT: better therapeutic strategies.
Erba et al, JACC 2013 (128) n=63 99mTc-WBC; Infected CIED Prospective	SPECT/CT confirmed diagnosis, defined extent & detected associated complications SPECT/CT sensitivity: 94%; NPV 95%
Heiba et al, Nucl Med Comm 2017 (129) (n=21) Tc-MDP & In-WBC; Pelvic pressure sore	*Compared to planar* DI- SPECT/CT: higher sensitivity, specificity & diagnostic confidence than either DI scintigraphy or SPECT/CT

Hung et al, Infect Dis 2017 (130) n=58 67Ga; FUO	*Compared to FDG-PET/CT* ^{67}Ga-SPECT/CT: high FN rate (55%) vs. FDG-PET/CT high FP rate (44%) Sensitivity: ^{67}Ga-SPECT/CT 79% vs. FDG-PET/CT 45% Clinical contribution: ^{67}Ga-SPECT/CT 72% vs. FDG-PET/CT 55%
Nowosinska et al, World J Nucl Med (131) n=18 67Ga; Infected kidneys in ESRF & renal transplant Retrospective	SPECT/CT contributory: 80% kidneys in ESRF & 33% renal transplant patients. SPECT/CT: 44% patients better location and/or extent; differentiating physiological from pathological uptake.

FUO – Fever of unknown origin
VGI – vascular graft infection
IE – infective endocarditis
CIED - cardiac implantable electronic devices
ESRF – end stage renal failure
CTA – CT angiography
FP –False positive; FN – False negative
DI – dual isotope

Table 11: Literature evidence on the role of SPECT/CT in primary hyperparathyroidism.

Author/Source/Year **No. patients (n)** **Type of study**	**Aim & Results**
Gayed et al, J Nucl Med 2005 (132) n=48 Retrospective	*Impact on Diagnosis* SPECT/CT: diagnosis of additional 2% PTA SPECT/CT localization: additional 8% (including 2 ectopic)
Krausz et al, World J Surg 2006 (133) n=36 Retrospective	*Preoperative localization* SPECT/CT localized 14 PTAs (10 ectopic & 4 in distorted neck anatomy) Role in planning surgery: 39% patients.
Lavely et al, J Nucl Med 2007 (134) n=110 Prospective	*Comparison of various acquisition protocols* Best diagnostic accuracy: early SPECT/CT + any delayed imaging
Neumann et al, J Nucl Med 2008 (135) n=61 Prospective	*Preoperative localization* SPECT/CT vs. SPECT: similar sensitivity (70% vs. 71%); higher specificity (96% vs. 48%)
Patel et al, Clin Radiol 2010 (136) n=63 Retrospective	*Preoperative localization; compared to US* Detectability rate: SPECT/CT 90% vs. US 64%. Concordant findings on SPECT/CT & US: 59%. US + SPECT/CT preoperative PTA localization: sensitivity 95%; accuracy 91%.
Pata et al, Thyroid 2010 (137) n=33 Retrospective	*Diagnosis (specifically in multinodular goitre); compared to SPECT* SPECT/CT localization (lateralization & neck quadrant): sensitivity 94 & 88%; specificity 93 & 96%; PPV 94 & 88%. Mean time of surgery: SPECT/CT 38 min vs. SPECT 56 min.
Pata et al, Ann Surg Oncol 2011 (138) n=55 Retrospective	*Cost-analysis for preoperative localization; compared to SPECT* Mean time of surgery: SPECT/CT 36 min vs. SPECT 62 min. SPECT/CT decrease in mean cost: 98.7 €.
Tokmak et al, Int J Clin Exp Med 2014 (139) n=154 Retrospective	*Diagnosis & localization* SPECT/CT detectability rate: 98% Sensitivity increased mainly in small lesions.
Burall GG et al, Mol Imaging Radionucl Ther 2012 (140) n=32	*Localization; compared to SPECT* SPECT/CT 31/32 patients vs. SPECT 22/32 FN on SPECT: lesions <10mm.
Ciappuccini et al, Clin Nucl Med 2012 (141) n=59	*Diagnosis & preoperative localization* Diagnosis by 2-phase SPECT/CT in 66% patients Correlation with serum Calcium and PTH values
Suh et al, Otolaryngol Head Neck Surg 2015 (142) n=38 Retrospective	*Localization; compared with 4D-CT & US* 4D-CT outperformed US & SPECT/CT with unique anatomic data in 8% patients

Mandal et al, Laryngoscope 2015 (143) n=75 Retrospective	*Diagnosis; dual-phase SPECT/CT* Early-phase SPECT/CT 76% vs. late-phase 74%. Early-phase localization: sensitivity 84%, specificity 89% (no improvement with dual-phase)
Koberstein et al, Can Assoc Radiol J 2016 (144) n=88 Retrospective	*Preoperative localization (specifically for ectopic PTA) & correlation with serum PTH* Localization: Similar accuracy & reliability for normal & ectopic PTAs (90 vs. 94%). SPECT/CT accuracy correlates with serum PTH levels.
Barber et al, Head Neck 2016 (145) n=259 Retrospective	*Cost-effectiveness of preoperative localization (combined with US)* US + SPECT/CT lateralization: sensitivity 87%, PPV 99%. Increased cost of US+SPECT/CT: 30% vs. SPECT/CT only
Keidar et al, Mol Imaging Biol 2017 (146) n=88 Retrospective	*Preoperative localization (by Perrier criteria)* SPECT/CT localization: accuracy 80%
Woods et al, Nucl Med Comm 2017 (147) n=135 Retrospective	*Diagnosis & localization (combined with 123Iodine)* DI-SPECT/CT detection & localization: sensitivity 95%, specificity 89%, PPV 97%, NPV 83%. Accuracy: diagnosis 94%; localization 92%.
Sandquist et al, Clin Nucl Med 2017 (148) n=249 Retrospective	*Preoperative localization; compared to SPECT* SPECT/CT sensitivity 83%, specificity 96%, SPECT/CT had fewer FPs (vs. SPECT) Main advantage: PTAs < 210 mg.
Christakis et al, Eur J Radiol 2017 (149) n=20	*Localization; compared to US & 4D-CT* 4D-CT + MIBI SPECT/CT: sensitivity 94% & accuracy 95%. US + 4D-CT + MIBI SPECT/CT: sensitivity & accuracy 100%.
Cheng et al, Clin Nucl Med 2018 (150) n=94	*Diagnosis & patient management* Positive SPECT/CT predicted eligibility for surgery.

PTA – parathyroid adenoma
PTH – parathyroid hormone
PPV – positive predictive value; NPV – negative predictive value

Table 12: Literature evidence on the role of cardiac SPECT/CT

Author/Source/Year **No. patients (n)** **Clinical indications** **Type of study**	**Aim & Results**
Schaap et al, J Cardiovasc Imaging, 2014, (151) n=205 Diagnosis of CAD; CCTA Prospective	*Incremental value of MP- SPECT/CCTA compared to SPECT and CCTA* SPECT/CCTA had higher yield vs. stand-alone SPECT or CCTA in diagnosis of significant CAD
Schepis et al, Eur J Nucl Med Mol Imaging 2007 (152) n=32 CT for AC & CCS	*Use of CT-AC & CCS measurements* Attenuation maps derived from CT for CCS enable accurate AC
Rispler et al, Int J Cardiol 2013 (153) n=53 123Iodine mIBG cardiac uptake quantitation Prospective	*SPECT/CT quantitation of 123I-mIBG* Total cardiac count measurements are feasible using the CT component for determining heart boundaries even in case of very low uptake
Rispler et al, JACC 2007 (154) n=56 Physiologic significance of CAD; SPECT/CCTA Prospective	*Physiologic significance of coronary lesions compared to CCTA* SPECT/CCTA: improved specificity & PPV in patients with chest pain
Kennedy JA et al. J Nucl Cardiology 2017 (155) n=312 CZT perfusion score data base; CZT-SPECT/CT for AC Prospective	*Measurements of perfusion scores in CZT- and NaI MPI-SPECT/CT in AC & NAC studies* Specific database for CZT cardiac SPECT is needed for accurate quantitative diagnostic perfusion scores
Schaap et al, Eur Heart J, Cardiovasc Imaging 2013 (156) n=98 Performance in intermediate & high CAD likelihood Prospective	*Performance of SPECT/CCTA compared to SPECT & CCTA* SPECT/CCTA: superior for diagnosis of significant CAD
Pretorius et al, J Nucl Cardiol 2017 (157) n= 1,103 Effect of respiratory motion & gender on MPI	Respiratory motion correction algorithms significantly reduce artefacts
Abdollahi et al, Eur J Radiol 2016 (158) n=509 Radiation exposure estimates	CT dose parameters are very low and below the reference level.
Özdemir et al, Mol Imaging Radionucl Ther 2016. (159) n=78 Prevalence of silent ischemia in (pre)diabetics Prospective	SPECT/CT defined prevalence of silent ischemia & adverse events in asymptomatic (pre-)diabetics & predicted future CAD
Engbers et al, J Nucl Cardiol 2015; (160) n=5,018 Algorithm for CAD diagnosis & dose reduction Prospective	*Comparison of sequential algorithms for CAD diagnosis & dose reduction* Stress first SPECT/CT: 50% of patients needed no additional testing.
Fiechter et al, Eur J Nucl Med Mol Imaging, 2011 (161) n=66 Diagnostic accuracy of CZT-SPECT/CT Prospective	*Compared to ICA* CZT SPECT/CT: high accuracy for detection of angiographically identified lesions

Abadi et al, Eur J Radiol 2010 (162) n=76 LV volumes & function measurements Prospective	*Measurement of SPECT LV volumes & EF; compared to CCTA* Caution when using SPECT and CT derived EF & volumes
Rispler et al, Eur J Nucl Med Mol Imaging 2011, (163) n=90 Risk stratification in NSTE acute coronary syndrome Retrospective	*SPECT/CCTA compared to TIMI risk score* 40% of high- & 16% of low TIMI-RS patients had hemodynamically significant lesions Normal perfusion spared revascularization regardless of TIMI-RS.
Tamam et al, World J Nucl Med 2016, (164) n=157 AC for MPI in (non)obese patients	*Diagnostic value of AC in inferior wall; compared to NAC; obese/non-obese patients* Iterative reconstruction > FBP to correct diaphragm attenuation of inferior wall AC with OSEM iterative reconstruction improves results of stress-only MPI, in particular in obese patients
Kennedy et al, J Nucl Med 2009, (165) n=124 Mis-registration impact on AC-MPI quality Retrospective	*Define SPECT/CT mis-registration with greatest impact on AC-MPI quality* SPECT/CT: significant mis-registration in 23%, in direction of most severe artefacts in 16% studies (lateral & anterior walls; SPECT myocardium overlap on lungs on CT)
Koopman et al, Nucl Med Comm 2015, (166) n=20 AC/NAC CZT-SPECT/CT processing protocols Retrospective	*CZT-SPECT/CT processing protocols for detection of ischemia; AC compared to NAC* Interoperator variations: 2.4±1.4% (NC) vs. 3.8±1.9% (AC) CZT-SPECT/CT operator variations in MPI processing: significant & influence diagnosis, especially with AC
Matsuo et al, Annals Nucl Med 2015, (167) n=40 AC/NAC acquisition protocols of 201Tl uptake Retrospective	*Comparison of new & conventional acquisition protocols with/without AC* Short IQ-SPECT acquisition: equivalent high image quality to conventional MPI

CAD – coronary artery disease
NSTE – non-ST-elevation
TIMI-RS – TIMI risk score
AC- attenuation correction; NAC – non-attenuated
CCS – coronary calcium score
CCTA – coronary CT angiography
MPI – myocardial perfusion imaging
CZT – Cadmium Zinc Tellurium
LV – left ventricle
FBP – filtered back projection

Table 13: Incidental findings on the CT component of the SPECT/CT

MAJOR	MODERATE	MINOR
Head & neck Parietal meningioma Orbital mass Parotid mass **Chest** Pneumothorax[+] Pulmonary embolism[+] Solid pulmonary mass **Abdomen** Solid liver mass Solid renal mass Gall bladder mass GIT mass Pancreatic solid/cystic mass Bilateral small kidneys Adrenal mass Retroperitoneal mass **Pelvis** Undescended testis Ovarian cyst >5 cm **Vascular** Deep vein thrombosis[+] Aortic aneurysm >5 cm[+] Aortic dissection * **Musculoskeletal** Vertebral body destruction Lytic bone lesions Indeterminate sclerotic bone lesion **Reticuloendothelial** LN > 1.5 cm and/or multiple LNs	**Head & neck** Thyroid incidentalomas **Chest** Pulmonary parenchymal opacity Emphysema Bronchiectasis Pleural effusion Cardiomegaly Pericardial effusion Breast nodule **Abdomen** Gallstone in common bile duct Air in biliary tree Absent kidney Renal calculus Hydronephrosis Complex renal cyst Splenomegaly Bowel inflammation Adrenal adenoma **Pelvis** Uterine mass Uterine enlargement Pelvic kidney Ureteric calculus Scrotal hydrocoelle Prostate enlargement **Vascular** Aortic ectasia Pulmonary artery dilatation Signs of portal venous hypertension Coronary artery calcification **Reticuloendothelial** LN > 1cm	**Head & neck** Parathyroid adenoma **Chest** Calcified pulmonary nodule **Abdomen** Gallstones in gallbladder Fatty liver Hepatic cysts Renal cysts Renal atrophy Appendicolith Abdominal wall hernia Umbilical hernia Hiatus hernia **Pelvis** Lipoma Bladder diverticulum Bladder stone Simple ovarian cyst Uterine fibroids Uterine calcifications Bartholin's cysts **Vascular** Left-sided vena cava Retroaortic left renal vein **Musculoskeletal** Muscle atrophy Bone infarct Degenerative spine changes

+: Notify referring physician

LN – lymph node

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