Supplementary Table 1. Summary of findings: Non-airway ultrasound parameters

Study Name	Study Design	Sample Size & Setting	Index Test: Ultrasound Variable	Reference Test for OSA diagnosis	OSA scoring criteria	Blinding	Intra/ Inter Rater Variability	Correlation with AHI or RDI	Diagnostic accuracy metrics (Sensitivity, specificity, PPV, NPV)*	Correlation with OSA diagnosis (Odds ratios)
Altin et al (2005)	Cohort Prospective	N=70 (Turkey) - Outpatient clinic	1. Mean IMT (Intima Media Thickness) – CCA, ICA, and carotid bulb 2. Presence of plaque in CCA, ICA, and carotid bulb.	Ambulatory PSG, MESAM (MAP Medizintechnik, Netherlands). No EEG.	Same as below, except; Oxygen desaturation threshold: 4% criteria No arousal. The diagnosis of OSAS was made on the basis of clinical findings and an AHI of at least 5.	US scan: NR PSG results: NR	Overall assessment: Good.	NR	Plaque presence and OSA diagnosis: Sensitivity 24% Specificity 100%*	Mean Carotid IMT (in mm) of severe OSA was significantly higher than those with mild OSAS and control subjects. Plaque presence: Patients with severe OSA were older, more severe AHI, and had multiple plaques.
Andonova et al (2012)	Cohort Prospective	N=54 (Bulgaria) - 27 with OSA and 27 controls	CCA- IMT and Plaque presence	Laboratory PSG, MEPAL (MAP, Medizin — Technologie, Martinsried, Germany) monitoring system.	Same as below, except; No arousal.	US scan: NR PSG results: NR	NR	cIMT with AHI: ($r=+0.43$, $p<0.05$)	Plaque presence and moderate OSA: Sensitivity 59% Specificity 70%	NR
Apaydin et al (2013)	Cohort Prospective	N=87 (Turkey) - Habitual simple snoring (HSS) / OSA: AHI >5	CCA-IMT	Laboratory PSG, Alice 5 System; Phillips-Respironics, Eindhoven, The Netherland	R and K, and AASM 1999	US scan: NR PSG results: Yes	NR	cIMT was higher among the habitual snoring group, p value=0.03; No correlation between severity of OSAS and CCA-IMT (Mild-Moderate OSAS : Severe OSAS p=0.55)	cIMT≥0.9mm, and OSA cut-off of AHI >5: Sensitivity 39% Specificity 81%*	NR

Baguet et al (2005)	Prospective	N=83 (France) - Sleep clinic	Carotid IMT & Plaque presence	PSG	Same as below, except; No arousal. The RDI was calculated and defined as the number of apneas and hypopneas per hour of sleep (full polysomnography) or per hour of recording (polysomnography without EEG recording). Sleep apnea was defined as an RDI 15/h.	US scan: NR PSG results: Yes	NR	Mean nocturnal SaO2 < 92% and minimal nocturnal SaO2 < 80% were associated with carotid plaque formation. Mean nocturnal Sao2 r=-0.30, p=0.006 Percentage of recording time spent at Sao2 90%, r= 0.19, p= 0.090 Minimal nocturnal Sao2, r= -0.12, p= 0.290	NR	<u>1. Mean nocturnal SaO2 < 92% and cIMT (>0.9mm):</u> Unadjusted OR, 3.9; 95% CI, 1.1 to 12.7. Adjusted OR 10.6; 95% CI, 1.6 to 50.9 in normotension, and OR 1.7, 0.3-10.9 in hypertension. Adjusted ORs, 3.1, 95% CI 1.0-9.4, and 3.1; 95% CIs, 1.0 to 8.5, respectively) independently of the BP status (hypertensive or normotensive).
H A Chami et al (2009)	Cross-Sectional	N=682 (Boston, USA) Framingham Heart Study site of the Sleep Heart Health Study AHI Groups: ≥30 15–29 5–14 1.5–4.9	1) Brachial Arterial Diameter 2) FMD (Flow Mediated Dilatation)	Home PSG, Compumedics P-series portable monitor (Abbotsford, Victoria, Australia). Unclear if EEG used.	Same as below, except; Oxygen desaturation threshold: 4% criteria No arousal criteria reported.	US scan: NR PSG results: NR	NR	NR	NR	<u>Multivariate linear regression model:</u> Mean BA diameter (mm) was 4.5 (SE, 0.11), 4.55 (0.07), 4.33 (0.04), 4.32 (0.04) for severe, moderate, mild, and no OSA, respectively ($p<0.05$). 2. No relation was found between SDB and FMD.
Ciccone et al (2012)	Cohort Prospective	N=156 (Italy)	Carotid IMT	In Hospital Sleep Study; Body movements, heart and pulse transit time (PTT) changes No EEG.	Unclear. Oxygen desaturation threshold: 4% criteria; The OSAS diagnosis was made on the basis of an apnea/ Hypopnea index (AHI) 5.and symptoms. Clear definitions were not provided.	US scan: NR PSG results: NR	NR	Positive relationship between IMT and OSAS duration ($r=0.342;p<0.001$) and between AHI and IMT ($r<0.51;p<0.001$). Age (years), r= 0.395, p=<0.001 BMI: r=-0.043, p=0.597; AHI: r= 0.508, p<0.001	cIMT$\geq$0.9mm and OSA cut-ff of AHI > 15 : 55% sensitivity & 100% specificity*	NR

Ciccone et al (2014)	Cohort Prospective	N=120 (Italy) - 80 OSA (newly diagnosed, AHI >=5) – Mild OSA-26/ Mod-Severe OSA-54; 40 controls	Carotid IMT	In lab portable PSG, SomtèCompumedics Inc., Abbotsford, VIC, Australia No EEG	Unclear.	US scan: NR PSG results: NR	NR	CIMT was significantly elevated in patients with OSA compared to non-OSA subjects (0.89 ± 0.13 mm vs. 0.65 ± 0.1 mm, $p < 0.01$). Similarly, in moderate-severe OSA, CIMT (0.95 ± 0.09 mm) was significantly increased as compared to patients with mild OSA (0.76 ± 0.1 mm; $p < 0.01$) or to control subjects (0.65 ± 0.1 mm; $p < 0.01$).	NR	NR
Drager et al. (2010)	Cohort Prospective	N=81	Carotid IMT,Carotid-Femoral Pulse Wave velocity (PWV) and Carotid Diameter (CD)	Overnight polysomnography (EMBLA - Flaga hf. Medical Devices, Reykjavik, Iceland)	AHI was calculated as the total number of respiratory events (apneas plus hypopneas) per hour of sleep Because of a high-expected prevalence of OSA in this population, the presence of OSA was restricted to the moderate to severe cases, i.e., AHI≥15 events per hour of sleep.	US scan: Yes PSG results: Yes	NR	Correlation with AHI: cIMT: R^2 = 0.12,; PWV: R^2 = 0.10 CD: R^2 = 0.20	NR	In comparison with MS−OSA patients, MS+OSA patients had higher levels of cIMT (661±117 vs. 767±140 mm, $p<0.05$) Atherosclerotic plaque was found in 10% of patients with MS−OSA and in 19.6% in patients with MS+OSA ($P = 0.14$).

Liu et al (2016)	Cohort Prospective	N=242 (Hong Kong) Respirology clinic – 221 OSA with AHI>=5	Mesenteric Fat thickness (MFT), Pre-peritoneal fat, Subcutaneous Fat Thickness	Portable, home PSG Alice LE, Respironics, Murrysville, PA, USA)	Same as below, except; Oxygen desaturation threshold: 4% criteria	US scan: NR PSG results: Yes	NR	<u>Correlation with AHI:</u> 1. Mesenteric fat thickness (r = 0.41, P < 0.001) 2. Pre-peritoneal fat thickness (r=0.27, p<0.01) 3. Subcutaneous fat thickness (r=0.082, p>0.05)	NR	<u>Multivariate logistic regression for metabolic syndrome:</u> Mesenteric fat thickness and AHI predicted metabolic syndrome only in men (OR 1.02, 95% CI 1.0-1.04, p=0.027), not in all patents (OR 1.01, 1.0-1.03, p=0.11), or in women (OR 0.98, 0.95-1.01, p=0.19).
Meng et al. (2009)	Cohort Prospective	N=123, Patients with acute corononary syndrome, who completed a successful percutaneous coronary intervention	Mean IMT, other echocardiographic parameters, levels of CRP, D-dimer and fibrinogen; Gensini score:, the frequency of unstable plaques	Overnight sleep study using an unattended system (Compumedics Sleep S-Series; Compumedics Ltd, Abbotsford Victoria, Australia	Mild OSAS (AHI 5-14) and moderate.severe OSAS (AHI > 15).	US scan: Yes PSG results: NR	Carotid ultrasonography was performed by two sonographers who were blinded to the other study data. Analysis of the carotid parameters used the internal software of the iU22 Ultrasound System and was carried out by the same operator.	The cIMT was weakly but positively correlated with AHI (r = 0.383); Gensini Score (r = 0.362), p<0.05.	NR	No statistically significant differences between patients with OSA or no OSA.
Minoguchi et al. (2005)	Cohort Prospective	N=52; (36 male newly diagnosed OSA, 16 obese male control	Carotid IMT, Plaque, IL-6, IL-8, CRP	Compumedics P-series Sleep System (Compumedics Sleep, Abbotsford, Australia)	Mild OSA: AHI >5; Mild OSA: 5-20; Mod OSA: 20-30	US scan: Yes PSG results: NR	NR	Carotid IMT was positively correlated with, AHI (r = 0.50, p = 0.002)	NR	Carotid IMT was significantly elevated in patients with OSA compared with obese control subjects (1.07 ± 0.05 vs. 0.71 ± 0.03 mm, p < 0.001); and in moderate to severe OSA (1.16 ± 0.05 mm) compared

										with patients with mild OSA (0.92 ± 0.07 mm, p < 0.003) or compared with obese control subjects (0.71 ± 0.03 mm, p < 0.0001)

Schulz et al. (2005)	Cohort Prospective	N=70 (35 consecutive OSA & 35 control)	Carotid IMT, Plaque presence, carotid stenosis.	PSG (Sidas GS; IfM GmbH, Wettenberg, German) y. Analysis of sleep stages using ReEchtschaffen and Kales system. Arousals and breathing events were scored as suggested by an ASDA task force.
				
				OSA was defined: AHI > 10 events per hr, and with symptoms.
					The apnea–hypopnea index (AHI) was obtained by dividing the total number of apneas and hypopneas by the total sleep time (TST). An AHI>10/h in companion with sleep-related symptoms was considered as diagnostic of OSA	US scan: Yes
						
						PSG results: Yes
							NR	c-IMT had poor correrlation with AHI (r=0.33, p value: NR)
								
								c-IMT and mean Sa,O2: r=-0.51, p,0.01;
								c-IMT and lowest Sa,O2: r=-0.41, p,0.05;
								c-IMT and SaO2,90% (% of TST): r=0.49, p,0.01.
								
								Plaque presence or carotid stenosis: No correlation with AHI
									NR	Mean C-IMT was markedly increased in the OSA patients when compared with the control group (p<0.01)

Wattanakit et al (2008)	Cross-sectional	N=985 (USA) participants in the Sleep Heart Health Study	Carotid Plaque formation, Carotid IMT	Portable monitor (Compumedics P Series System, Abbotsford, Victoria, Australia)	The respiratory disturbance index (RDI) was calculated as the mean number of apneas and hypopneas per hour of sleep. except; hypopnea was defined as a decrease in airflow or thoracoabdominal excursion of approximately 30% of baseline for 10 s or more; and Oxygen desaturation threshold: 4% criteria	US scan: NR PSG results: NR	NR	Carotid IMT: Unadjusted mean carotid IMT and crude predicted CIMT values increased in ascending quartiles of RDI, but adjusted means were similar across quartiles. There were no statistically significant associations of other indices of nocturnal hypoxemia.	NR	Carotid plaque formation: Compared with the first quartile of RDI, the crude odds ratio was 1.14 (95%CI: 0.80–1.63) for the second quartile, 1.27 (95%CI: 0.88–1.82) for the third quartile, and 1.48 (95%CI: 1.03–2.13) for the fourth quartile. All of these associations were attenuated after adjusting in a multivariate model.

Yun et al. (2010)	Cohort Prospective	N=104 adults (≥20 years) consecutively-March 2007 and March 2008 who had a history of habitual snoring or observed apneas. OSA: 82 Non-OSA: 22	Carotid IMT, Endothelial microparticles(EMPs), Endothelial progenitor cells(EPCs),	Full-night diagnostic polysomnography (Comet XL Lab-based PSG, TWin PSG software, Grass-Telefactor, West Warwick, RI, USA).	Non-OSA: AHI<5 Mild OSA: 5-15 Moderate: 15-30 Severe: >30	US scan: Yes PSG results: Yes	NR	IMT was correlated with AHI with minimum saturation (r=-0.56, p<0.001) Apnea-hypopnea index (AHI) (r=0.71, p<0.001) correlated with IMT	NR	The frequency of occurrence of a plaque did not differ among non-OSA (5.6%), mild-OSA (18.8%), moderate-OSA (10.0%), and severe-OSA (27.8%) subjects (p=0.42), and was not associated with either EMP level or EPC index (p>0.05).

AHI – Apnea-Hypopnea Syndrome; BA – Brachial Artery; CCA – Common Carotid Artery; CD – Carotid Diameter; CV - Coefficient of variation; EMP – Endothelial Microparticles; EPC – Endothelial progenitor cells; FMD - Flow Mediated Dilatation; ICA – Internal Carotid Artery; IMT - Intima Media Thickness; MS - Metabolic Syndrome; OSA – Obstructive Sleep Apnea; PSG – Polysomnography; PWV – Pulse Wave Velocity; SDB – Sleep Disordered Breathing. Scoring criteria: Obstructive apnea was defined as complete cessation of airflow or a > 90% reduction in the peak thermal sensor signal for at least 10 s; a hypopnea episode was defined as >50% reduction in the nasal pressure signal for at least 10s in association with oxygen desaturation > 3% and/or arousal.