

**Evidence Table - Oral Appliance Review**

Author/Citation// Question // Reviewer // Evidence Level	Study Design // Location (type) // Oral Appliance // Adjustable or Titratable // Titration	Selection Criteria Include (Exclude) // Sample Size // Rationale // Age // Gender // BMI // Hypopnea	Outcomes AHI // Min O <sub>2</sub> Sat // ESS // Other // Adverse Events	Categorical Treatment Snoring // Other // Predictors	Internal Bias // External Bias	Reviewer Comments	Study Conclusions
Barnes et al// 22//1,5// WSN//1	RCT, comparison to placebo and to alternative treatment; crossover with CPAP, randomized treatment order, selected subjects, prospective// Sleep lab (full PSG, attended)// MRA, full, custom// Adjustable// Protocol defined: maximal comfortable protrusion, end-point criterion: maximal advance tolerated, advance measured: 10.3 mm (0.3)	OSA/severity, dental criteria (NS)// NS// 47.0 (0.9)// 80% M// 31.1 (0.5)// Referenced	Baseline AHI 21.3 ±1.3 (mean±SD); CPAP grp: post = 4.8 ±0.5, p=.001, .05 vs MRA; MRA grp: post = 4.8 ±0.5, p=.001; Placebo grp: post = 20.3 ±1.1, p=NS// Baseline Min SaO <sub>2</sub> : 86.7 ± 0.6% (mean±SD); CPAP grp: post = 91.9 ± 0.3% p= .001; .05 vs MRA; MRA grp: post = 87.8 ±0.4%, p= .001; Placebo grp: post = 95.4 ±0.6%, p=NS// Baseline ESS 10.7 ±0.4 (mean±SD); CPAP grp: post = 9.2 ±0.4, p= .001; MRA grp: post = 9.2 ±0.4, p=.001; Placebo grp: post mean= 10.2 ±0.4, p=NS// FOSQ- Baseline = 3.1 ±0.1 (mean±SD); CPAP grp: post =3.3 ±0.1, p=.001; MRA grp: post = 3.3 ±0.1, p=.001; Placebo grp: post =3.3 ±0.1, p= .01. MWT- Baseline grp: =30.7 ±0.9 (mean±SD); CPAP grp: post = 30.0 ±0.9, p=NS; MRA grp: post = 29.6 ±0.9, p=NS; Placebo grp: 28.0 ±0.9, p=NS// NS	NS// MRA, Success- AHI<10 grp: 49.1% success; AHI<15, no sx grp: 55.2% success// NS	Patient selection: no, confounding factors: no directional dropout of bias, crossover bias; randomized// Population generalized: to OSA of mild-moderate severity (AHI 30-)	In a placebo-controlled RCT, efficacy is CPAP>MRA>placebo; sleepiness, CPAP>MRA>placebo; QoL; CPAP=MRA>placebo; and neurobehavioral tests no change	
Bloch, et al//9// 1,6//JT//1	Case series with crossover, comparison to baseline and alternate therapy, randomized treatment order // Sleep lab (full PSG, attended) // Herbst, Monobloc, full, custom// Adjustable // Protocol defined: yes, end point: subjective success, anterior opening measured: yes	Snoring + OSA (AHI>5), adequate dentition (dental criteria- dental disease, sleep disorders)// Sample size not justified // 50.5 ± 1.5 // 24M, 1F // 27.4±0.6 // <25% baseline calibrated- Respiration sum signal	Herbst grp: pre AHI= 22.6± 3.1 (mean±SD), post = 8.7±1.5, p<.05; Monobloc grp: pre = 22.6±3.1, post = 7.9±1.6, p<.05 // NS // Herbst grp: pre ESS = 13.5, (mean±SD), post = 9.0, p<.05; Monobloc grp: pre = 13.5, post = 9.0, p <.05 // Arousal index: Herbst pre mean= 41.0±3.7, post mean= 30.9±3.6 p<.05; Monobloc grp: pre mean=41.0±3.7, post mean= 26.5±3.9, p<.05. Snoring index: Herbst grp: pre mean= 41.0±3.7, post mean= 32.5±4.6, p<.05; Monobloc grp: pre mean= 41.0±3.7, post mean= 21.4 ± 4.2, p<.05 // Minor-temp: TMJ pain 7/24, tooth pain 3/24 muscle pain 4/24, same incidence each MRA MRA grp: pre mean=31 ± 26,	Herbst grp: 53% success, Monoblocgrp: 74% success, no significant difference; Preference- Herbst: 1/24, Monobloc: 15/24, p<.008// NS// NS	Patient selection: CPAP-refusing OSA, variable severity// Population generalized: OSA refusing CPAP, intensity: mild-severe		Two oral appliances in snoring and OSA to some degrees, but the custom Monobloc is preferred Herbst OA
Engelman, et	Randomized	OSA/severity:	MRA grp: pre mean=31 ± 26,	NS// MRA grp:	Patient	Effect size estimated	Significant differences

all/96// 1,2,3,5,6//KF- RC//1	controlled crossover, comparison to CPAP, consecutive subjects, prospective, PSG scorer blinded// Sleep lab initially, baseline PSG, fu home (respiratory monitoring, unattended)// MRA 1 custom, full; MRA 2 custom, partial// Yes// Crossover after 2 months on each Rx, protocol defined: set at 80% max mandibular protrusion, anterior open measured: 2-4mm	AHI>4, age- 18 to 70, 2 or more symptoms include sleepiness- ESS >8 or sleepiness driving (dental criteria: <4 teeth either arch, other- plims, narcolepsy, major medical illness, shift work, living more than 50 miles from Edinburgh)// N=48 allowed power of 99% to detect 1 SD difference between treatment scores// 46 ± 9 years (range 18-70)// 48 finished- 36 M, 12 F// 28 ± 4 MRA, 31 ± 5 CPAP//NS	postmean=15 ±16, 52% decrease; CPAP grp: pre mean= 31 ± 26, post mean=8 ± 6, 74% decrease, effect size CPAP vs MRA .45, p<.001// NS// MRA grp:pre mean=14 ± 4, post mean= 12 ± 5;CPAP grp: pre mean= 14 ± 4, post mean=8 ± 5, effect size .57 CPAP vs MRA, p<.001// Performance-quality of life, FOSQ- MRA grp: post mean= 13 ± 3; CPAPgrp: post mean= 14 ±2, effect size .51 between CPAP & MRA, p=.001. Well being- SF 36- all 3 parameters better with CPAP than with MRA, effect sizes .34 - .52 for the 3 parameters// NS// Minor/temporary: pain= 33(69%). excess salivation= 9(19%); poor retention= 19(40%); sleep disturbance= 12 (25%); CPAP mask problems= 11 (23%), mask off during sleep 7 (15%), sleep disturbance= 16 (33%), stuffy nose= 8 (17%)	success (AHI<10) 22 (47%) Grp CPAP success (AHI<10) 31 (66%)// Predictors of Rx preference: higher BMI, greater daytime impairments tended to prefer CPAP vs MRA	selection- no; conf fact: no; crossover bias: not mentioned 24 started CPAP, 24 started MRA 1st, errors in ascertain: no careful follow up; loss to follow: minimal, met sample size needed for power calc//Populatio n generalized: probably, intensity: good range, sample enriched for sleepiness	and outcome measures extensive	outcomes between M CPAP: AHI, effectiveness symptom scores (ESS, FOSQ (qual of life), S (well being), better with CPAP, no significant differences in outcome between MRA & CPA objective daytime sleep measurements by MVR SF36- physical compo hospital anxiety & depression scale, cog scores, SE's, reported usage, preference. No significant differences outcomes between 2 appliances: no difference, satisfaction, effectiveness, or SE out between 2 MRA device subgroup analysis- n SAHS patients AHI 5- symptoms, efficacy, satisfaction, ESS, FO SF36 mental compon scores better with CP than MRA, preferred CPAP in 14 out of 18
Ferguson, et all/25// 1,3,4,5//WSN//1	Crossover with other appliance with CPAP// Sleep lab, home (PSG attended)// MRA, full occlusal coverage,custom// Titratable// NS	OSA/severity, dental criteria (OSA/severity, dental criteria)// NS// 44 (10.6)// NS// 32 (8.2)// 50% decrease in Respitrace (effort)	MRA grp: pre mean= 25.3(15.0), post mean= 14.2(14.7), p <.005; CPAP grp: pre mean= 23.5(16.5), post mean= 4.0(2.2), p <.005 // MRA grp: pre mean= 78.7(8.6), post mean= 75.8(11.6); CPAP grp: pre mean= 76.8(9.1), post mean= 87.7(2.4) // MRA grp: pre mean= 10.3(3.1), post mean= 4.7(2.6), p <.005; CPAP grp: pre mean= 11.0(3.8), post mean= 5.1 (3.3), p <.05// NS// Minor/temporary: pain, sore teeth, jaw muscles, minor, excessive salivation	MRA grp: 45%failed, CPAP grp: 0%failed// NS// NS	Patient selection: yes, errors in ascertain: uncertain (home study)// Population Generalized: gender not specified, intensity: mild to moderate OSA		OA is an effective treat in some patients with moderate OSA and is associated with greater satisfaction than CPA
Ferguson, et all/26// 1,4,5//KF-RC//1	Randomized crossover with MRA and CPAP// Sleep lab (attended, PSG for Dx pre and post at home PSG unattended)//	OSA/ severity- mild-moderate AHI (15-50), dental criteria - 10 teeth each arch, live in metro Vancouver	MRA grp: pre mean= 19.7±13.8, post mean= 9.7±7.3, 51% decrease, p<0.005; CPAP grp: pre mean= 17.6±13.2, post mea= 3.6±1.7, 80% decrease, p<0.005// Lowest saturations- MRA grp: pre mean=	MRA grp: 76% success; CPAP grp: 100%success// Treatment success =	NS, NS, No crossover bias - tested for period and carryover effect, 2 week	Randomized controlled cross-over follow-up - complete follow-up on 25 of 27 patients enrolled for the clinical data	CPAP more effective vs 48% with criterion and symptoms reduced Side effects more common with CPAP; patient preference and patient

	<p>SnoreGuard partial occlusal, non-custom or pre-fabricated?// No// Protrusion 7mm, anterior opening 7 mm</p>	<p>(NS)// NS// 46.2±10.9 (25-72)// 24 M, 3 F//30.4±4.8 (21-42)// ≥50% decrease effort</p>	<p>83% ±7.4, post mean= 83.8% ±7.3, unchanged; CPAP grp: pre mean= 83% ±6, post mean= 88.7% ±2.5, 7.4% increase, p&lt;0.05// NS// NS// Muscle pain with MRA mild and temp, 1 patient mod-sev; no TMJ; more side effects with CPAP</p>	<p>AHI&lt;10 with improved symptoms - MRA 48% vs 62% for CPAP// EDS- MRA grp: 52% success; CPAP grp: 72% success. Satisfaction moderately -very satisfied p&lt; 0.05 SG vs CPAP- SG grp: 68% success; CPAP grp: 62% success//NS</p>	<p>washout between Rx, NS, some patients no PSG with MRA - couldn't retain appliance at night// Populations generalized: sleep lab referral practice, intensity: mild to moderately severe OSA (AHI 15 -50)</p>		<p>satisfaction higher with</p>
<p>Gostopoulos, et al//100// 1,4//KF-RC//1</p>	<p>RCT, comparison to placebo grp, crossover with placebo appliance, prospective, consecutive, double blind// Sleep lab (PSG, attended)//MRA, full custom// Titratable// Protocol defined: wore MRA for acclimatization period (8 ± 4 wks) - incremental advancement until max comfortable limit reached then washout and rand to either Rx for 4 wks then crossover to other Rx, advance measured: 7 ± 2mm (3-13), 80% ± 9% maximum protrusion (50-95%), protrusive range measured: yes</p>	<p>OSA/severity- AHI &gt; 10, dental criteria- ability to protrude mand by ≥3mm, age &gt;20years, at least 2 symptoms include EDS, snoring, witnessed apneas, fragmented sleep (dent criteria- insufficient teeth, bad gag reflex, periodontal disease or dental decay, central sleep apnea psychiatric disease, narcotic or sedative or psychoactive drug use)// NS//4 8±11// 59M, 14 F// 29 ± 4.7// Citation (reference earlier paper)</p>	<p>MAS grp: pre mean= AHI 27.1 ±15.3, post mean=12 ± 2, 55.6% decrease, p=significant; placebo grp: pre mean= AHI 27.1±15.3 post mean=25±2, 7.7% decrease, p=NS, MRA vs. Control p&lt;0.0001// MRA grp: pre mean= 86±6, post mean= 89±1, 3.5% increase; placebo grp: pre mean= 86±6, post mean= 86±1, 0% change, p&lt;.0001 MRA vs Control// MRA grp: pre mean= 11 ±5, postmean= 7±1, 36.3% decrease, p=significant; placebo grp: pre mean= 11±5, post mean= 9±1, 18% decrease, p&lt;.01, p&lt;.0001 MRA vs placebo, (82% normal ESS in MRA vs 62% placebo, p&lt;.01)// Arousal index- MRA grp: pre mean= 35±13.5, post mean= 25±2, 28.6% decrease, p=significant; placebo grp: pre mean= 35±13.5, post mean= 33±2, 5.7% decrease. Sleepiness- MSLT (min)- MRA grp: post mean 10:3 ± .5; placebo grp: post mean= 9:1 ± .5, p=.01 for MRA vs placebo (48% normal MSLT MRA, 34% normal MSLT placebo). Snoring frequency (snores per hour)- MRA grp: post mean=207±20, placebo grp: post mean=366 ± 21, snoring frequency much less with MRA (p&lt;.0001).</p>	<p>NS// Complete response (AHI&lt;5 per hour) - MRA grp: 36% success; placebo grp: 0% success. Partial resp (AHI down by 50% but&gt;5)- MRA grp: 27% success; Placebo grp: 0% success. Treatment failure (AHI not down by 50% or &lt;5)- MRA grp: 27 failure (37%) Grp Placebo 73 failure (100%)/NS</p>	<p>Patient selection: yes, confounding factors: no, crossover bias: no treatment by period interaction or period effects from MSLT, ESS, or PSG variables, errors in ascertain: good careful monitoring, loss to f/u: not a problem// Population generalized: yes, likely, intensity: good range of severity</p>	<p>More patients reported improved frequency &amp; intensity of snoring with MRA, more patients reported improved sleep quality with MRA, more patients reported satisfaction with MRA, good snoring measurement objectively obtained, well done, thorough follow-up, no effect of placebo, large sample size</p>	<p>Large randomized placebo controlled study showed MRA improve snoring and both subjective and objective sleepiness</p>

Hans, et al//32//2,4//KF//2	RCT, comparison to alternative appliance, crossover with other appliance (device B to Device A), prospective//Home (unattended, respiratory monitoring only)//12 patients MRA, 12 patients modified MRA without advance, partial, prefabricated//No//Protocol defined: MRA (device A) set with incisors edge to edge, ~ 6 to 8 mm forward protrusion, 6 to 8 mm ant opening, Device B: no advancement and 1 mm ant opening, Advance measured: yes, Anterior opening measured: yes	Snoring, no systemic disease (OSA/severity: AHI >30/hour (unless referred), dental criteria: edentulous subjects, age: minors, chronic disease, sed-hypn meds, pregnant women, prisoners, minors, mental disability, previous surgery for OSA, other sleep disorders, severe EDS//NS//51.9 ± 12.3 (range 25 to 69 years)//20M, 4F//NS	snoring intensity less with MRA// NS// Minor/temporary: jaw discomfort more common with MRA, more tooth discomfort with MRA, more excess salivation with MRA	NS//NS//NS	Patient selection: yes, by sleep study – but patients not well described in terms of symptoms, confounding factors: pts were similar in both groups. Said they were randomized but not how it was done, crossover bias (order effect): Nearly all patients using Device B crossed-over to the MRA, errors in ascertainment: not measured – but only a two week treatment period, loss to f/u: 33% lost in Device B, 17% lost in MRA group (Device A)// Population generalized: probably, intensity: good range of severity included	Not a bad study, small in numbers, but patients randomized to the groups, one appliance unlikely to be effective (Device B) due to absence of advancement of mandible and in that group most patients got worse, the MRA (Device A) was fairly effective even in severe patients.	
Johnston, et al//106//1,3,4//WSN-	RCT, comparison to placebo group// Home (unattended,	Snoring, OSA/severity, dental criteria	MRA (10 subjects) grp: pre mean= 35.6 ± 28.4, post mean=21.1 ± 21.4, p<0.05; Device B (8 subjects) grp: pre mean=36.5 ± 43.7, post mean= 46.8 ± 46.9, p=NS; All MRA (17 subjects) grp: 42.4 ± 37.5, post mean= 29.7 ± 21.4, p<0.05//NS//MRA (10 subjects) grp: pre mean=12.0 ± 3.9, post mean=8.2 ± 4.0, p<0.05; Device B (8 subjects) grp: pre mean= 13.0 ± 4.5, post mean=12.5 ± 5.7, p=NS; All MRA (17 patients) grp: pre mean=12.9 ± 4, post mean=9.6 ± 4, p<0.005//NS//NS	NS// NS// NS	MRA grp: pre mean=31.9 (21.2) all patients, post mean=22.9(22.8), p=.011 OA vs placebo; Placebo grp:	MRA effective for mild - moderate OSA. Less effective in more severe	

RR//2	respiratory monitoring)// MRA// No// NS	(NS)// Yes// 55.1// 16 M, 4 F// 31.6// 50% reduction air flow	post mean=37.7 (24.9) // NS// MAA grp: pre mean=13.9(6.4) all patients, post mean= 11.6(6.7), p= NS OA vs placebo; Placebo grp: post mean=12.6(6.3)// ODI-MAA grp: pre mean=30.7(18.8) all patients, post mean=21.1 (19.8), p=.002; OA vs placebo- Placebo grp: post mean=31.2(18.2)	position determined a priori, not adjustment for effect// NS	cases	Well-done randomized controlled trial or placebo study - 62% had complete or partial response in patients with moderate/severe OSA
Mehta, et al//56// 1,2,4,6// KF-RC//2	Random crossover placebo control trial// Sleep lab (full PSG, attend)// MRA, full, custom//Yes// Advanced to max tolerated protrusion over 19.7±8.8 weeks (range 5-40 wks) mean advance 7.5 ± 1.8 mm (78% of max protrusion), anterior opening 3-4 mm	Snoring, OSA/severity- AHI ≥ 10 per hr, ≥ 2 symptoms of OSA (dental criteria - edentulous, periodontal disease, exaggerated gag reflex, regular sedative use)// Sample size of 30 for power of 0.8 and p< 0.05 // 48 ± 9 (range 35-73)// 19 M,5 F// 29.4 ± 3.1 (24.8-36.3)// ≥50% reduction in airflow or thoracoabdominal movement, 10 sec + a desaturation ≥3% or arousal	Active grp: pre mean= AHI 26 ± 15, post mean= 14 ± 2, 46% decrease; Placebo grp: pre mean= 26 ± 19, post mean= 30 ± 2, 15% increase; p<0.0001 between active and placebo grp at outcome// Active grp: pre mean= 88 ± 7, post mean= 91 ± 1, 3% increase; Placebo grp: pre mean= 82 ± 9, post mean= 87 ± 1, 6% increase; p<0.0001 between active and placebo grp at outcome// Active grp: pre mean= 10.1 ± 1.1, post mean= 3.9 ± 0.6, p<0.01; Placebo grp: NS// Snoring Frequency per hour- Active grp: post mean: 242 ± 28, 47% decrease;Placebo grp: post mean= 402 ± 29, p<0.005 between active and placebo grp at outcome. Snoring- mean snoring intensity, dB- Active grp: post mean= 49 ± 1; Placebo grp: 52 ± 1, p< 0.0001 between active and placebo grp at outcome. Snoring, max snoring intensity, dB- Active grp: post mean= 68 ± 1; Placebo grp: post mean= 70 ± 1, p=NS between active and placebo grp at outcome. Arousal index- Active grp: post mean= 27 ± 2, 34% drop; Placebo grp: post mean= 41 ± 2, p<0.0001 between active and placebo grp at outcome// Minor-temporary: pain, jaw discomfort 12.5%, excess salivation 50%, gum irritation 20%, mouth dryness 46%, tooth grinding 12.5%	Subjective reports - Active grp:70% success// Complete success: resolution of symptoms & AHI < 5 per hour; partial response; improved symptoms & AHI reduced by 50% but AHI staying over 5 per hour; Tx failure; ongoing symptoms &/or not reduced by 50%; Compliance failure, inability to use the tx. Complete grp: 37.5% success; Partial grp: 25% success; Failure grp: 37.5% fail; Sleep Quality- Active grp: 91% success; Placebo grp: NS?//Predictive equation for post Rx AHI: neck circumference-baseline AHI (high NC or high AHI - higher AHI post Rx) + 2	Patient selection: yes, No, No Crossover bias, None, loss to f/u: few dropouts and they were considered compliance failures// Population generalized: typical OSA patients, intensity: good severity range	Calculated time in supine sleep but did not analyze effect of supine on A+HI with MAS, NC at online data supplement, blinding not mentioned

Pitsis, et al//97//1,2,6/WNSN-RR//1	RCT, comparison to placebo group, compare to alternative treatment group// Sleep lab (PSG, attended)// No// MRA-4, 14mm opening, full occlusal coverage, custom// NS// Protocol defined: yes, advance measured: yes, anterior opening measured: yes	OSA severity: AHI>5, other-2 symptoms (OSA-sev: CSA, dent crit: edent, other-perio disease)// NS//50 yrs mean// 20M, 3F// 31 mean// NS// NS	MRA-1 4mm opening grp: pre mean= 21, post mean= 8; MRA-2 14mm opening grp: pre mean= 21, post mean= 10// MRA-1 4mm open grp: pre mean= 87, post mean= 89; MRA-2 14mm open grp: pre mean= 87, post mean= 88// MRA-1 4mm open grp: pre mean= 18, post mean= 12; MRA-2 14mm open grp: pre mean= 18, post mean= 12// NS// TMJ: min-temp, jaw discomfort, other- min-temp: salivation, dry mouth, tooth grinding, gum irritation	ceph measurements Complete success (no sx, AHI<5)- 4mm grp: 52% success, 14mm grp: 35% success; partial success (sx better, AHI<50% initially)- 4mm grp: 22% success, 14mm grp: 26% success// NS// NS	Patient selection: yes, confounding factors: no, crossover bias: no, loss to f/u: 1 out 24// Population: mild-moderate OSA	Long-term OA use pre dental movement, us minor and asymptomatic Bite opening of OA do affect efficacy, but sm opening more acceptable too	
Randerath, et al//X09//1//KF//2	RCT, comparison to alternative treatment group// Sleep lab (full PSG, attended)// MRA, activator, full occlusal coverage, custom// NS// Not well described, anterior opening measured: 12 mm	CPAP more effective.MRA not titrated. Sub-optimal result with ISAD// No//56.5 ± 10.2// 16M,4F// NS// Reduction of ± 50% in airflow > 10 sec or reduced flow and effort with a 4% desat	MRA grp: pre mean=17.5 ± 7.7, post mean= 13.8 ± 11.1; CPAP grp: pre mean= 17.5 ± 7.7, post mean=3.2 ± 2.9// MRA grp: pre=83.6 ± 4.6, post=85.3 ± 3.1; CPAP grp: pre=83.6 ± 4.6, post= 89 ± 3.4//NS//Arousal Index-MRA grp: pre=21.8 ± 9.9, post=17 ± 5.1; CPAP grp: pre=21.8 ± 9.9, post=14.1 ± 5.1; Snoring (snores per hour)- MRA grp: pre=54.5 ± 26/hr, post=36.4 ± 17.7; CPAP grp: pre=54.5 ± 26, post= 10.3 ± 5.0 // NS	NS//Success AHI < 10- ISAD- 30% success, 70% failed; CPAP- 100% success// No AHI, younger age, better result	Patient selection: yes, confounding factors: no, crossover bias: no, errors in ascertainment: no, loss to f/u: no// Population generalized: yes, intensity:mild to moderate	CPAP more effective. MRA not titrated. Sub-optimal result with MRA	
Rose, et al//107//1,2,3//KF-RR//2	Randomized crossover with other appliance, prospective// Both sleep lab, home (attended baseline PSG, unattended home, respiratory monitoring for f/u)// MRA: type A MRA-full, custom; MRA:type B MRA partial, custom// Both adjustable// Protocol defined: both appliances were set at 75% max protrusion, anterior opening: MRA-5mm, MRA appliance-10-12mm	Mild OSA, >10 healthy teeth per arch, refused CPAP(TMJ problems)// No// 56.8±5.2//22M, 4F// 27.5±3.1// Airflow reduced by ≥ 50% below baseline for at least 10 seconds	Type A MRA grp: pre mean= 16.0±4.4 post mean= 7.4±5.3, 53.8% decrease, p<0.01;Type B MRA grp: pre mean=16.2±4.6 post mean= 5.5±3.3, 66% decrease, p<0.01//Type A MRA grp: pre mean= 89.1±3.2 post mean= 90.1±4.8, 1% increase, p ?signif; Type B MRA grp: pre mean= 88.7±1.2 post mean= 92.2±2.1, 3.9% increase, p=significant// NS// Snoring (VAS 1-10)- Type A MRA grp: pre mean= 9.1±0.8 post mean= 3.2±1.4, 65% decrease; Type B MRA grp: pre mean= 8.8±1.0 post mean= 3.4±2.7, 61% decrease, p=significant; Daytime Sleepiness (VAS 1-10)- Type A MRA grp: pre mean= 7.2±1.7, post mean= 5.4±1.0, 25% decrease, p=significant; Type B K grp: pre	NS//NS//NS	Patient selection: mild OSA diagnosed in the sleep lab, confounding factors: randomized, crossover bias: not applicable, errors in ascertainment: subjects likely used the appliance, loss to f/u: very high-large number failure to crossover	Well-done study in a thin older group of patients with mild OSA. Good comparison of 2 distinctive appliances. Trouble following the patients in the trial-not all clearly accounted for. The AHI was lower with the MRA appliance. No success rate given for reductions in AHI	Both appliances effective mild OSA. Treatment outcome influenced by design

Walker-Engstrom, et al/?/?//1//KF//1	RCT, comparison of an appliance at 2 settings, prospective, blinded evaluators, intention to treat analysis// Home, unattended (resp monitoring only)//MRA, partial occlusal coverage, custom //No// Protocol defined: yes, set at 75% to max protrusion or 50% maximum, end point criterion: advance	Severe OSA at > 20, age: 20-65, no drug abuse and no mental illness (pronounced malocclusion, severe cardiac, resp, neural disease, nasal obstruction)// Yes, 40 patients per grp for a power of 80% to detect a greater 25% difference in normalization rates	75% grp: pre mean= 50.4 ± 4.7, post mean=15.6 ± 6.2, response= 69% ↓, p= < 0.001; 50% grp: 47.0 ± 5.1, post mean= 17.4 ± 5.7, response =63% ↓, p= <0.001// NS// 75% grp: pre mean= 11.5 ± 3.1, post mean= 7.5 ± 2.6, response= 35 % ↓, p=<0.001; 50% grp: pre mean= 11.7 ± 3.1, post mean= 8.6 ± 2.8, response =26% ↓, p= < 0.001 // ODI-75% grp: pre mean =49.7 ± 5.6, post mean= 19.1 ± 7.0, response= 34% ↓, p= < 0.001; ODI-50% grp: post mean = 18.0 ± 6.0, response= 59.6% ↓, p-value= <0.001; // Snoring Index= 75% grp,	75% MRA grp- 77% success, 23% failed; 50% MRA grp-62% success, 38% failed//Tx success AI < 5 and AHI < 10. 75% group- 52%success,48 % failed; 50% grp-31% success, 69% failed; satisfied with Rx-90%	Patient selection: yes, confounding factors: no, patients were randomized to the two different groups, cross-over bias: no, errors in ascertainment: no, loss to f/u: minimal - intention to	Blinded, intention to treat, sample size calculation, severe OSA patients, detailed f/u	Well-done adequately powered study that showed more advancement in more success with OSA MRA tx
Tan, et al//102//2,3//WSN,RR//1	Prosp, RCT, consecutive patients, crossover study of MRA to CPAP//Lab-PSG//full occlusal coverage//Single position appliance set at 75% of max protrusion (10 subjects) or partly adjustable appliance (14 subjects) titration not described	mild mod OSA (AHI >10 and <50), dental criteria:adequate, age:>18(OSA/severity, dental criteria)ns//50.9//20m, 4f//31.9//ns	mean= 7.0±1.5 post mean= 4.1±0.7, 41% decrease, p=significant; Sleep quality (VAS 1-10)- Type A MRA grp: pre mean= 6.4±1.8 post mean= 4.1±1.4, 36% decrease p=significant; Type B MRA grp: pre mean= 6.2±1.2 post mean= 4.5±2.1, 27% decrease p=significant//Failure to tolerate: 1 patient, pain in jaw and/or TMJ: 2 patients sev-d/c Rx, mild in 5/23, gag reflex: 1 patient d/c Rx, Other: failure to retain appliance in the mouth in 2 pts, xs salivance # not given	ns//other:Success s=use+AHI<10 group MRA n success=16 n failed=7 % success=70%. Group CPAP n success=22 n failed=2 % success=ns// General health scores improved with both treatments - no diff between treatments; 17 of 21 who used both treatments chose the MRA for long term treatment.	Patient selection NS//NS//No apparent order effect, two-week wash-out //NS//Minimal loss to follow-up//generalizable//good range of severity	Adherence not stated.	The MRA may be a safe alternative to CPAP in patients with mild to moderate OSA. MAS well tolerated and preferred by the majority of subjects

<p>Wilhelmsson plus SE from Tegelberg (#84) and Qual of life from Walker-Engstrom (#88) and Ringqvist (XO2) and WalkerEngstrom (#89)/90//1,3,4, 5//KF-WSN-RC-RR//1</p>	<p>measured: 50% group 5.0 mm (4.8 to 5.3) 75% group 7.2 mm (6.7-7.6) anterior opening measured: 2mm</p>	<p>with the more advanced appliance and alpha of 0.05// 50.4 in 75% grp, 54.3 in 50% grp// All male// 30.2 ± 1.2 in the 75% MA group (no difference between grps) 30.5 ± 1.4 in the 50% MA group//50% reduction in airflow with a 4% desat</p>	<p>pre mean = 0.86 ± 0.1, post mean = 0.57 ± 0.1, 34 % ↓, p-value &lt; 0.001; 50% grp- pre mean = 0.83 ± 0.1, post mean = 0.66 ± 0.1, response = 20.5 %, p-value = &lt; 0.001//TMJ discomfort, 75% grp - minor-temp in 12.5%, none in 50% grp; Occlusal change, 75% group - minor-temp in 15%, 50% grp - minor-temp in 5%</p>	<p>success, 10% failed; success defined as a decrease of 50% in AI of AHI- 75% grp- AI 88% success, 12% failed; 75% grp- AHI 83% success, 17% failed; 50% grp- AI 78% success, 22 % failed; AHI 76% success, 24% failed// Lower BMI lower, more advancement</p>	<p>treat//population: can be generalized, intensity: focus on severe OSA</p>	<p>Large prospective random study compared MRA to UPPP with sample size calc, blinded sleep study scoring &amp; complete follow up, needs intention to treat analysis, (Tegelberg references Wilhelmsson, Walker-Engstrom ref both Teg and Wil) data from Tegelberg #84 regarding adherence &amp; SE in MRA grp, data from Waler-Engstrom paper 88 for quality of life, data from Ringqvist (XO2) for long term side effects</p>	<p>Large prospective random study showing that UPPP more effective than OA Fours year use of OA limited mandibular protrusion (50% max) partial dental coverage (molars) producers no significant dental or occlusal change. Good long-term outcomes in OA group</p>
	<p>RCT, prospective, comparison to baseline &amp; alternative Rx (UPPP)// Home (respiratory monitoring only, unattended)// MRA, full occlusal coverage, custom// No// Protocol defined: set 50% max protrusion (4-6mm), anterior opening measured: 5mm interincisal</p>	<p>NS (OSA/severity: AI &gt; 25, dental criteria -insufficient teeth, bad maloccl., severe periodontal disease, severe caries, age: &lt;20 or 65years, other- mental illness, drug misuse, nasal obstruction, severe cardiovascular, respiratory or neurological disease)// Sample size based upon pred success rate- MRA 80%, UPPP 50%, alpha = .05, beta = .2, needed 35 patients in each arm to detect diff, assumed drop out rate 10 patients per group, enrolled 49 MRA and 46 in UPPP// 49.3yrs MRA, 51yrs UPPP// All M// 26.9MRA, 27.1 UPPP//50% reduction in air-flow</p>	<p>MRA grp: pre mean AHI= 18.2(15.7 - 20.8 95% CI), post mean AHI= 5.8, - 12.4 response, p&lt;.001; UPPP grp pre mean= 20.4 (17.4 - 23.3 95% CI), post mean=10.4, -10resp, p&lt;.001//MRA pre mean AI= 10.8 (9.2 - 12.4 95% CI), post mean= 2.2, -8.6 response, p&lt;.001; UPPP grp pre mean AI= 12.3 (10.7 - 13.9 95% CI), post mean= 5.5, -6.8 resp, p&lt;.001; greater fall in AHI &amp; in AI with MRA than with UPPP//NS- no difference in sleepiness at baseline between grps at 12 months no difference between grps, but did improve from baseline?// Snoring index (# per hour), MRA grp: pre mean= 0.7 (-.6- .8 95%CI) post mean= 0.5, -.1 response; UPPP grp: pre mean= 0.7 (-.7- .8 95% CI) post mean= 0.5, -.2 response, p&lt;.001; Oxygen desat index (# 4% desats per hr), MRA grp: pre mean= 17(14.1-19.8 95% CI), post mean= 6.1, -10.9 response, p&lt;.001; UPPP grp, pre mean= 18.4 (15-21.8 95% CI), post mean= 9.3, -9.1 response, p &lt;.001; //SE mentioned in Tegelberg study #84 at 12 months: 2/37 patients with severe TMJ, 1/37 mild TMJ; 5/37 oral dryness; 8/37 stiffness in jaw; 0/37 occlusal change, from Walker-</p>	<p>NS// Success AHI 50% reduction, Grp MRA, 30 of 37 completers (81%), 30 of 49 rand, 61% success, Grp UPPP 26 of 43 completers (60%), 26 out 46 rand (57%), GRP completers - MRA better reducing AHI by 50%; intention to treat no diff// Other- compliance - Tegelberg #84 73% pts (27/37) used MRA ≥5 nts/week//Other - QOL - Walker-Engstrom #88 - QOL improved in both UPPP and MRA grps at 1 yr, with contentment higher in UPPP group//Pred: BMI</p>	<p>Patient selection: NS, confounding factors: NS, crossover bias: NS, errors in ascertainment: NS, loss to f/u: significant in MRA grp, not in UPPP// Population: probably generalizable, intensity: mild to moderate OSA</p>		

			<p>by the rmistor with 4% desaturation</p>	<p>Engstrom (#89) after 4 years - TMJ: minor-temporary=1patient; occlusal changes: minor-temporary= 4patients, severe-permanent=1pt; Retention problems, broken plastic, broken clasps: minor-temporary, from Ringqvist (X02) Cephalometry: in comparison to UPPP group (no OA therapy) no change in skeletal or dental parameters except for minor elongation of incisors</p>	<p>not factor in MRA grp, higher BMI more fall in AI in UPPP, PUAO: MRA grp- dominant obst in oropharynx (type I) in 24pts, hypopharynx in 2, combo in 15, type 1: MRA success 96% UPPP 77%, type II &amp; III- MRA success 92%, UPPP success 59%, success not diff for diff obstruct types regardless of Rx grp//Walker- Engstrom (#89) after 4 years 72% of OA group successful Rx, UPPP group 35% success</p>			
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