

## Supplementary Online Content

Mykoniatis I, Pyrgidis N, Sokolakis I, et al. Assessment of combination therapies vs monotherapy for erectile dysfunction: a systematic review and meta-analysis. *JAMA Netw Open*. 2021;4(2):e2036337. doi:10.1001/jamanetworkopen.2020.36337

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This supplementary material has been provided by the authors to give readers additional information about their work.

## eAppendix 1. PubMed Search Syntax and Search String

### Search syntax

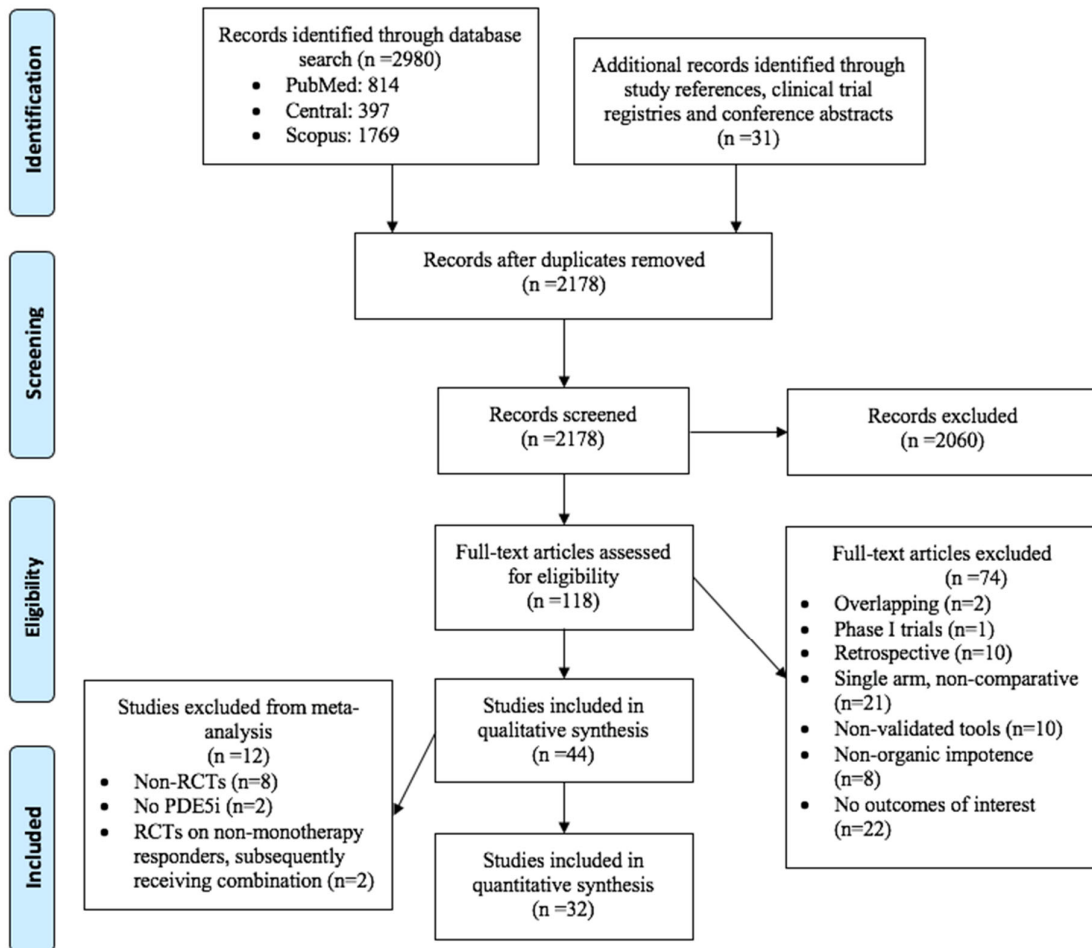
<b>ID</b>	<b>Search</b>
#1	"Sexual dysfunction" [All fields]
#2	"Sexual disorder" [All fields]
#3	"Erectile function" [All fields]
#4	Erection [All fields]
#5	"Erectile dysfunction" [All fields]
#6	"Erectile disorder" [All fields]
#7	Impotence [All fields]
#8	"International index of erectile function" [All fields]
#9	IIEF [All fields]
#10	"penile erection" [MeSH Terms]
#11	OR #1-11
#12	"combination treatment" [All fields]
#13	"combination therapy" [All fields]
#14	"multimodal therapy" [All fields]
#15	"multimodal treatment" [All fields]
#16	"combined treatment" [All fields]
#17	"combined therapy" [All fields]
#18	"add on" [All fields]
#19	add-on [All fields]
#20	co-treatment [All fields]
#21	cotreatment [All fields]
#22	coadministration [All fields]
#23	co-administration [All fields]
#24	coadmin* [All fields]
#25	cotreat* [All fields]
#26	synergistic [All fields]
#27	synerg* [All fields]
#28	OR #11-27
#29	#11 AND #28

## Search string

((((((("sexual dysfunction"[All Fields] OR "sexual disorder"[All Fields]) OR "erectile dysfunction"[All Fields]) OR "erectile disorder"[All Fields]) OR "impotence"[All Fields]) OR "erectile function"[All Fields]) OR "erection"[All Fields]) OR "international index of erectile function"[All Fields]) OR "IIEF"[All Fields]) OR "penile erection"[MeSH Terms]) AND (((((((((((("combination group"[All Fields] OR "combination treatment"[All Fields]) OR "combination therapy"[All Fields]) OR "multimodal therapy"[All Fields]) OR "multimodal treatment"[All Fields]) OR "combined treatment"[All Fields]) OR "combined therapy"[All Fields]) OR "add-on"[All Fields]) OR "add-on"[All Fields]) OR "co-treatment"[All Fields]) OR "cotreatment"[All Fields]) OR "coadministration"[All Fields]) OR "co-administration"[All Fields]) OR "coadmin\*"[All Fields]) OR "cotreat\*"[All Fields]) OR "synergistic"[All Fields]) OR "synerg\*"[All Fields])

The search strategy was developed for PubMed and modified accordingly for the other databases.

## eAppendix 2. Flow Diagram of Study Selection Process



PDE5i: phosphodiesterase type 5 inhibitor; RCT: randomized controlled trial.

### eAppendix 3. References of All Excluded Studies With Reasons for Exclusion

#### Overlapping study records

1. Ruffo A, Franco M, Illiano E, Stanojevic N. Effectiveness and safety of Platelet rich Plasma (PrP)cavernosal injections plus external shock wave treatment for penile erectile dysfunction: first results from a prospective, randomized, controlled, interventional study. *Eur Urol Suppl* 2019;18(1):e1622-e1623.
2. Sebastianelli A, Spatafora P, Frizzi J, et al. Which Drug to Discontinue 3 Months After Combination Therapy of Tadalafil plus Tamsulosin for Men with Lower Urinary Tract Symptom and Erectile Dysfunction? Results of a Prospective Observational Trial. *Eur Urol Focus* 2019;

#### Phase I clinical trials

1. Diamond LE, Earle DC, Garcia WD, Spana C. Co-administration of low doses of intranasal PT-141, a melanocortin receptor agonist, and sildenafil to men with erectile dysfunction results in an enhanced erectile response. *Urology* 2005;65(4 CC-Common Mental Disorders CC-Urology):755-759.

#### Retrospective observational trials

1. Giuliano F, Joussain C, Denys P. Safety and Efficacy of Intracavernosal Injections of AbobotulinumtoxinA (Dysport®) as Add on Therapy to Phosphodiesterase Type 5 Inhibitors or Prostaglandin E1 for Erectile Dysfunction-Case Studies. *Toxins (Basel)* 2019;11(5).
2. Kimura M, Caso JR, Bañez LL, et al. Predicting participation in and successful outcome of a penile rehabilitation programme using a phosphodiesterase type 5 inhibitor with a vacuum erection device after radical prostatectomy. *BJU Int* 2012;110(11 Pt C):E931-8.
3. Labairu-Huerta L, Padilla-Fernández B, Arrondo-Arrondo JL, et al. PDE-5 inhibitors in monotherapy versus combination therapy in a sample of 1200 patients with erectile dysfunction. *Arch Ital di Urol Androl organo Uff [di] Soc Ital di Ecogr Urol e Nefrol* 2015;87(3):204–9.
4. Mydlo JH, Volpe MA, Macchia RJ. Initial results utilizing combination therapy for patients with a suboptimal response to either alprostadil or sildenafil monotherapy. *Eur Urol* 2000;38(1):30–4.
5. Mydlo JH, Volpe MA, MacChia RJ. Results from different patient populations using combined therapy with alprostadil and sildenafil: predictors of satisfaction. *BJU Int* 2000;86(4):469–73.
6. Mydlo JH, Viterbo R, Crispin P. Use of combined intracorporal injection and a phosphodiesterase-5 inhibitor therapy for men with a suboptimal response to sildenafil and/or vardenafil monotherapy after radical retropubic prostatectomy. *BJU Int* 2005;95(6):843–6.
7. Raina R, Nandipati KC, Agarwal A, Mansour D, Kaelber DC, Zippe CD. Combination therapy: medicated urethral system for erection enhances sexual satisfaction in sildenafil citrate failure following nerve-sparing radical prostatectomy. *J Androl* 2005;26(6):757–60.
8. Raina R, Pahlajani G, Agarwal A, Jones S, Zippe C. Long-term potency after early use of a vacuum erection device following radical prostatectomy. *BJU Int* 2010;106(11):1719–22.

9. Verze P, Capece M, Creta M, et al. Efficacy and safety of low-intensity shockwave therapy plus tadalafil 5 mg once daily in men with type 2 diabetes mellitus and erectile dysfunction: a matched-pair comparison study. *Asian J Androl* 2020;22(4):379.
10. Yassin AA, Saad F, Diede HE. Testosterone and erectile function in hypogonadal men unresponsive to tadalafil: results from an open-label uncontrolled study. *Andrologia* 2006;38(2 CC-Urology):61-68.

Single arm, non-comparative studies

1. Bang WJ, Oh CY, Yoo C, et al. Efficacy and safety of the simultaneous administration of mirodenafil and an  $\alpha$ -blocker in men with BPH-LUTS: A multicenter open-label prospective study. *Int J Impot Res* 2013;25(4):149–54.
2. Bechara A, Casabé A, De Bonis W, Nazar J. Efectividad de las ondas de choque de baja intensidad (LIWS) en varones con disfunción eréctil (DE) no respondedores a IPDE5. Estudio piloto. *Arch Españoles Urol* 2015;68(2):152–60.
3. Cangunen O, Bailen J, Fredriksson W, Bock D, Burnett AL. Combination of vacuum erection device and PDE5 inhibitors as salvage therapy in PDE5 inhibitor nonresponders with erectile dysfunction. *J Sex Med* 2009;6(9):2561–7.
4. Casabé A, Roehrborn CG, Da Pozzo LF, et al. Efficacy and safety of the coadministration of tadalafil once daily with finasteride for 6 months in men with lower urinary tract symptoms and prostatic enlargement secondary to benign prostatic hyperplasia. *J Urol* 2014;191(3):727–33.
5. Chatterjee R, Kottaridis PD, McGarrigle HH, Linch DC. Management of erectile dysfunction by combination therapy with testosterone and sildenafil in recipients of high-dose therapy for haematological malignancies. *Bone Marrow Transplant* 2002;29(7):607–10.
6. Chung BH, Lee JY, Lee SH, Yoo SJ, Lee SW, Oh CY. Safety and efficacy of the simultaneous administration of udenafil and an  $\alpha$ -blocker in men with erectile dysfunction concomitant with BPH/LUTS. *Int J Impot Res* 2009;21(2):122–8.
7. Gacci M, Vittori G, Tosi N, et al. A Randomized, Placebo-Controlled Study to Assess Safety and Efficacy of Vardenafil 10mg and Tamsulosin 0.4mg vs. Tamsulosin 0.4mg Alone in the Treatment of Lower Urinary Tract Symptoms Secondary to Benign Prostatic Hyperplasia. *J Sex Med* 2012;9(6):1624–33.
8. Garcia JA, Sanchez PE, Fraile C, Escovar P. Testosterone undecanoate improves erectile dysfunction in hypogonadal men with the metabolic syndrome refractory to treatment with phosphodiesterase type 5 inhibitors alone. *Andrologia* 2011;43(5):293–6.
9. Gholamine B, Shafiei M, Motevallian M, Mahmoudian M. Effects of pioglitazone on erectile dysfunction in sildenafil poor-responders: a randomized, controlled study. *J Pharm Pharm Sci a Publ Can Soc Pharm Sci Soc Can des Sci Pharm* 2008;11(1):22–31.
10. Greenstein A, Mabjeesh NJ, Sofer M, Kaver I, Matzkin H, Chen J. Does sildenafil combined with testosterone gel improve erectile dysfunction in hypogonadal men in whom testosterone supplement therapy alone failed? *J Urol* 2005;173(2):530–2.
11. Kalinchenko SY, Kozlov GI, Gontcharov NP, Katsiya G V. Oral testosterone undecanoate reverses erectile dysfunction associated with diabetes mellitus in patients failing on sildenafil citrate therapy alone. *Aging Male* 2003;6(2):94–9.
12. Kaplan SA, Reis RB, Kohn IJ, Shabsigh R, Te AE. Combination therapy using oral alpha-blockers and intracavernosal injection in men with erectile dysfunction. *Urology* 1998;52(5):739–43.
13. Kondoh N, Higuchi Y, Maruyama T, Nojima M, Yamamoto S, Shima H. Salvage

- therapy trial for erectile dysfunction using phosphodiesterase type 5 inhibitors and vitamin E: Preliminary report. *Aging Male* 2008;11(4):167–70.
14. Lee JY, Cho SY, Oh CY, et al. Efficacy and safety of combination therapy with mirodenafil and  $\alpha$  1-blocker for benign prostatic hyperplasia-induced lower urinary tract symptoms accompanied by erectile dysfunction: A multicenter, open-label, prospective study. *Int J Impot Res* 2011;23(6):249–56.
  15. Özkıdık M, Gökce Mİ, Yaman Ö. Efficacy of tadalafil treatment on erectile dysfunction in patients under dutasteride treatment: A prospective non-randomized comparative study. *Turkish J Urol* 2018;44(4):294–7.
  16. Park MG, Yeo JK, Cho D-YY, et al. The efficacy of combination treatment with injectable testosterone undecanoate and daily tadalafil for erectile dysfunction with testosterone deficiency syndrome. *J Sex Med* 2015;12(4):966-974.
  17. Tas A, Ersoy A, Ersoy C, Gullulu M, Yurtkuran M. Efficacy of sildenafil in male dialysis patients with erectile dysfunction unresponsive to erythropoietin and/or testosterone treatments. *Int J Impot Res* 2006;18(1):61–8.
  18. Tsai C-C, Wang C-J, Lee Y-C, et al. Low-Intensity Extracorporeal Shockwave Therapy Can Improve Erectile Function in Patients Who Failed to Respond to Phosphodiesterase Type 5 Inhibitors. *Am J Mens Health* 2017;11(6):1781–90.
  19. Tuken M, Culha MG, Serefoglu EC. Efficacy and safety of dapoxetine/sildenafil combination tablets in the treatment of men with premature ejaculation and concomitant erectile dysfunction-DAP-SPEED Study. *Int J Impot Res* 2019;31(2):92–6.
  20. Yang L, Cai J, He D. Linear focus extracorporeal shockwave therapy in the treatment of erectile dysfunction: a multi-center, prospective, randomized, double-blinded, placebo controlled study. *J Endourol* 2017;31:A330-.
  21. Yassin D-J, Yassin AA, Hammerer PG. Combined testosterone and vardenafil treatment for restoring erectile function in hypogonadal patients who failed to respond to testosterone therapy alone. *J Sex Med* 2014;11(2):543–52.

Studies evaluating combination therapy versus monotherapy with non-validated tools

1. Giuliano F, Joussain C, Denys P. Safety and Efficacy of Intracavernosal Injections of AbobotulinumtoxinA (Dysport®) as Add on Therapy to Phosphodiesterase Type 5 Inhibitors or Prostaglandin E1 for Erectile Dysfunction-Case Studies. *Toxins (Basel)* 2019;11(5).
2. Kimura M, Caso JR, Bañez LL, et al. Predicting participation in and successful outcome of a penile rehabilitation programme using a phosphodiesterase type 5 inhibitor with a vacuum erection device after radical prostatectomy. *BJU Int* 2012;110(11 Pt C):E931-8.
3. Labairu-Huerta L, Padilla-Fernández B, Arrondo-Arrondo JL, et al. PDE-5 inhibitors in monotherapy versus combination therapy in a sample of 1200 patients with erectile dysfunction. *Arch Ital di Urol Androl organo Uff [di] Soc Ital di Ecogr Urol e Nefrol* 2015;87(3):204–9.
4. Mydlo JH, Volpe MA, Macchia RJ. Initial results utilizing combination therapy for patients with a suboptimal response to either alprostadil or sildenafil monotherapy. *Eur Urol* 2000;38(1):30–4.
5. Mydlo JH, Volpe MA, MacChia RJ. Results from different patient populations using combined therapy with alprostadil and sildenafil: predictors of satisfaction. *BJU Int* 2000;86(4):469–73.
6. Mydlo JH, Viterbo R, Crispin P. Use of combined intracorporal injection and a phosphodiesterase-5 inhibitor therapy for men with a suboptimal response to sildenafil

- and/or vardenafil monotherapy after radical retropubic prostatectomy. *BJU Int* 2005;95(6):843–6.
7. Raina R, Nandipati KC, Agarwal A, Mansour D, Kaelber DC, Zippe CD. Combination therapy: medicated urethral system for erection enhances sexual satisfaction in sildenafil citrate failure following nerve-sparing radical prostatectomy. *J Androl* 2005;26(6):757–60.
  8. Raina R, Pahlajani G, Agarwal A, Jones S, Zippe C. Long-term potency after early use of a vacuum erection device following radical prostatectomy. *BJU Int* 2010;106(11):1719–22.
  9. Verze P, Capece M, Creta M, et al. Efficacy and safety of low-intensity shockwave therapy plus tadalafil 5 mg once daily in men with type 2 diabetes mellitus and erectile dysfunction: a matched-pair comparison study. *Asian J Androl* 2020;22(4):379.
  10. Yassin AA, Saad F, Diede HE. Testosterone and erectile function in hypogonadal men unresponsive to tadalafil: results from an open-label uncontrolled study. *Andrologia* 2006;38(2 CC-Urology):61-68.

#### Studies in potent participants or in patients with non-organic ED

1. Alwan AA, Ajeel HT, Abd AH, et al. A comparative study for the effectiveness of tamsulosin alone versus tamsulosin plus tadalafil combination as an expulsive medical treatment in the management of lower ureteric calculous in al-diwanayah teaching hospital. *Int J Res Pharm Sci* 2019;10(2):1551-1555.
2. Cantoro U, Catanzariti F, Lacetera V, Quaresima L, Muzzonigro G, Polito M. Comparison of tamsulosin vs tamsulosin/sildenafil effectiveness in the treatment of erectile dysfunction in patients affected by type III chronic prostatitis. *Arch Ital di Urol Androl organo Uff [di] Soc Ital di Ecogr Urol e Nefrol* 2013;85(3):109–12.
3. De Rose AF, Giglio M, Traverso P, Lantieri P, Carmignani G. Combined oral therapy with sildenafil and doxazosin for the treatment of non-organic erectile dysfunction refractory to sildenafil monotherapy. *Int J Impot Res* 2002;14(1):50–3.
4. Ibishev KS. Efficiency of combined therapy with impaza and type 5 phosphodiesterase inhibitors in prophylactics of posttraumatic erectile dysfunction. *Bull Exp Biol Med* 2009;148(2):322–4.
5. Kosilov K V, Kuzina IG, Kuznetsov V, Kosilova EK. Improvement of the symptoms of lower urinary tract and sexual dysfunction with tadalafil and solifenacin after the treatment of benign prostatic hyperplasia with dutasteride. *Prostate Int* 2020;
6. Kumar S, Kondareddy C, Ganesamoni R, Nanjappa B, Singh SK. Randomized controlled trial to assess the efficacy of the combination therapy of alfuzosin and tadalafil in patients with lower urinary tract symptoms due to benign prostatic hyperplasia. *LUTS Low Urin tract symptoms* 2014;6(1):35-40.
7. Singh DV, Mete UK, Mandal AK, Singh SK. A comparative randomized prospective study to evaluate efficacy and safety of combination of tamsulosin and tadalafil vs. tamsulosin or tadalafil alone in patients with lower urinary tract symptoms due to benign prostatic hyperplasia. *J Sex Med* 2014;11(1):187–96.
8. Tak G, Singh A, Ganpule A, Sabnis R, Desai M. Double blind, randomized, placebo controlled study of Tadalafil with Dutasteride vs Tadalafil with placebo for Lower urinary tracts symptoms secondary to benign prostatic hyperplasia: a single centre study. *Child Dev* 2019;201(4):e462-.

#### Studies not reporting clinical outcomes of interest

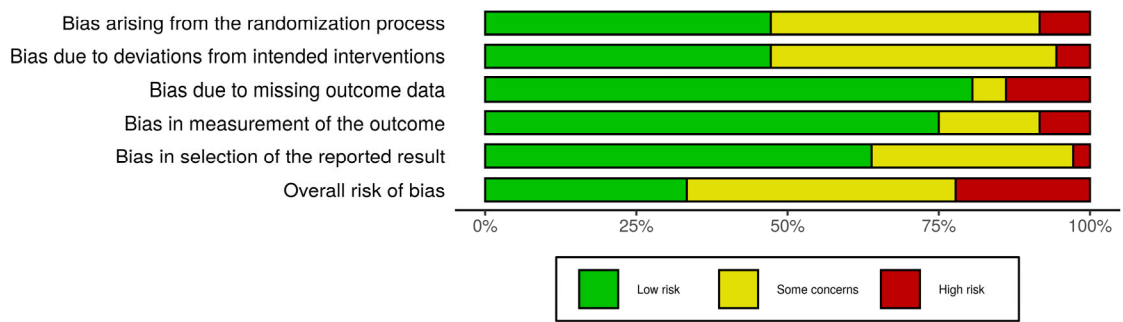
1. Akhvlediani ND, Matyukhov IP. [New data on the effectiveness of Tadalafil alone and in combination with NeyroDoz in treating erectile dysfunction associated with



- secondary premature ejaculation]. *Urologiia* 2016;(5):52–6.
2. Aksonov P, Gorpynchenko I, Romaniuk M. Assessment of the treatment efficacy of the low-energy shock wave therapy in patients with vascular erectile dysfunction. *J Sex Med Conf 18th Congr Eur Soc Sex Med Madrid Spain Conf start 20160204 Conf end 20160206 Conf Publ 2016;13(5 SUPPL. 2):S115.*
  3. Aleksandre B, Andro D, Milad H, Nino A, George B. Combination treatment with low intensity extracorporeal shock waves and PDE5 inhibitors for vasculogenic erectile dysfunction: a comparative study. *Eur Urol Suppl* 2019;18(12):e3628–9.
  4. Aliaev I, Vinarov AZ, Akhvlediani ND. Choice of treatment of erectile dysfunction associated with hypogonadism. *Urologiia* 2010;(4 CC-Urology):37-8, 40-2.
  5. Dmitriev DG, Gamidov SI, Mazo EB, Ovchinnikov RI. A new approach to raising efficiency of pharmacotherapy of erectile dysfunction. *Ter Arkh* 2002;74(10):75–7.
  6. Kamalov AA, Khodyreva LA, Dudareva AA, et al. [Results of a multicenter non-interventional study on the efficacy and safety of NeyroDoz complex for sexual dysfunction in men]. *Urologiia* 2016;(1 Suppl 1):47–53.
  7. Kamalov AA, Nizov AN. [Efficiency of phosphodiesterase-5 inhibitors for treatment of lower urinary tract symptoms in patients with benign prostatic hyperplasia and concomitant erectile dysfunction]. *Urologiia* 2019;(4):130–4.
  8. Kamalov AA, Osmolovskii BE, Okhobotov DA, et al. [Combined treatment of patients with erectile dysfunction and urination disorders]. *Urologiia* 2013;(3):29-30,32-33.
  9. Kamalov AA, Takhirzade AM. [Approaches to medical management of patients with high risk of progressing of benign prostatic hyperplasia depending on concomitant erectile dysfunction]. *Urologiia* 2018;(3):70–7.
  10. Karpukhin I V, Bogomol'nyĭ VA. [Physical factors in the treatment and rehabilitation of patients with chronic prostatitis complicated by impotence]. *Vopr Kurortol Fizioter Lech Fiz Kult* 1999;(2):25–7.
  11. Kim DY, Park YJ, Sung LH, Kim JC. Efficacy and safety of combination of alfuzosin and low dose udenafil once daily versus monotherapy in patients with comorbid lower urinary tract symptoms and erectile dysfunction: randomized prospective open-label study. *Eur Urol Suppl* 2012;11(1):e754-754a.
  12. Kyzlasov PS, Plekhanova OA, Volodin DI, et al. New approach to preserve male sexual function after nerve-sparing radical prostatectomy. *Eur Urol Suppl* 2019;18(12):e2063-.
  13. Li GY, Liang JH, Meng ZB, et al. Low-dose testosterone undecanoate capsules combined with tadalafil for late-onset hypogonadism accompanied with ED. *Zhonghua nan ke xue [National J andrology]* 2013;19(7):630-633.
  14. Lombardo F, Tsamatropoulos P, Piroli E, et al. Treatment of erectile dysfunction due to C677T mutation of the MTHFR gene with vitamin B6 and folic acid in patients non responders to PDE5i. *J Sex Med* 2010;7(1 Pt 1):216–23.
  15. Mazo EB, Dmitriev DG, Gamidov SI, Ovchinnikov RI. [Sildenafil and alprostadil in the combined drug therapy of erectile dysfunction]. *Urologiia* 2002;(3):39–43.
  16. Mazo EB, Gamidov SI, Iremashvili V V, Sotnikova EM. [The role of testosterone drugs in combined therapy of erectile dysfunction in patients with metabolic syndrome]. *Urologiia* 2007;(4):63-66,69.
  17. Mazo EB, Gamidov SI, Sotnikova EM. Effects of different treatments on endothelial function in patients with erectile dysfunction and hypogonadism]. [Russian. *Ter Arkh* 2008;80(12 CC-Urology):59-63.
  18. Piubello G. Efficacy of a nutraceutical preparation as add-on treatment in patients with erectile dysfunction treated with 5-PDE inhibitors: A pilot study. *J Andrological Sci* 2010;17(4):178–82.

19. Ridha M, Renaldo J, Budiono, Hardjowijoto S. Randomised controlled trial of tamsulosin and tadalafil for lower urinary tract symptoms with erectile dysfunction. *BJU Int* 2014;114:1-2.
20. Tiequn L. Study on relevance of the medical treatments between ED and LUTS. *Chinese J Androl* 2008;22(12):26-9.
21. Volkov AA, Petrichko MI, Budnik N V, Dukhin AR. [Tadalafil in patients with benign prostatic hyperplasia during conservative combined therapy]. *Urologiia* 2013;(2):56,58-59.
22. Xin Z-C. Safety and efficacy of sildenafil and doxazosin gits for treating chinese patients with ED with BPH/LUTS. *J Sex Med* 2012;9:125.

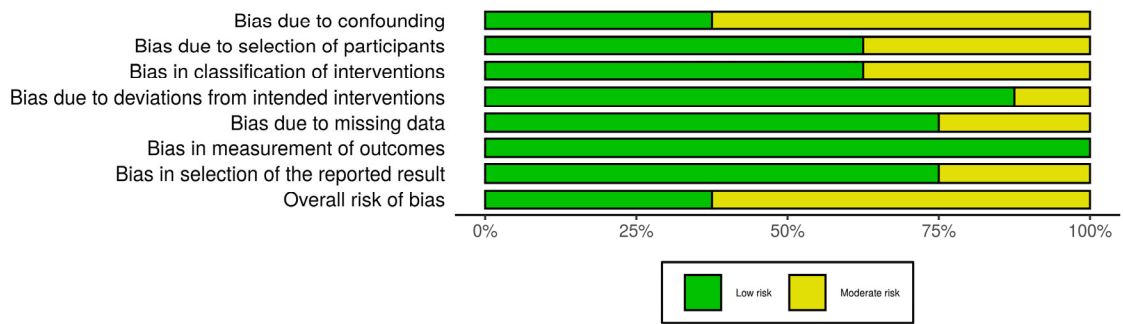
## eAppendix 4. Risk of Bias in RCTs



Study	Risk of bias domains					Overall
	D1	D2	D3	D4	D5	
Abolysor 2013	-	-	+	-	-	-
Aversa 2003	-	-	+	+	-	-
Baccaglioni 2020	+	+	+	+	+	+
Bayraktar 2019	X	+	X	-	-	X
Buvat 2011	+	+	+	+	+	+
Cavallini 2005	+	+	+	+	+	+
Chen 2004	+	-	+	+	-	-
Chen 2012	-	-	+	+	+	-
Cui 2015	-	-	+	+	+	-
El Taleb 2019	+	+	+	+	+	+
El Hamd 2020	+	+	-	-	+	-
El-Wakeel 2019	-	-	X	+	-	X
Engel 2011	-	X	X	+	-	X
Gallo 2020	+	+	+	+	+	+
Gentile 2004	+	+	+	+	+	+
Hamidi Madani 2013	-	+	+	+	+	-
Herrmann 2006	X	-	X	X	+	X
Jin 2011	-	-	X	+	+	X
Jung 2008	-	-	+	-	-	-
Kaplan 2007	-	-	+	+	+	-
Karami 2016	-	X	+	X	-	X
Kim 2017	+	+	+	+	+	+
Kumar 2015	-	-	+	X	X	X
Law 2019	+	+	+	+	+	+
Liquori 2009	+	+	+	+	-	-
Morano 2007	+	+	+	+	+	+
Raina 2005	X	-	+	+	-	X
Rey-Valzacchi 2012	+	+	-	+	+	-
Ruffo 2020	-	-	+	+	-	-
Shabsigh 2004	+	+	+	+	+	+
Shamloul 2005	-	-	+	+	+	-
Shirai 2018	+	+	+	+	+	+
Spitzer 2012	+	+	+	+	+	+
Sun 2014	+	-	+	+	+	-
Tuncel 2010	-	-	+	-	+	-
Vicari 2010	-	-	+	-	-	-

Domains:  
D1: Bias arising from the randomization process  
D2: Bias due to deviations from intended intervention  
D3: Bias due to missing outcome data  
D4: Bias in measurement of the outcome  
D5: Bias in selection of the reported result  
Judgement  
High (Red X)  
Some concerns (Yellow -)  
Low (Green +)

## eAppendix 5. Risk of Bias in Non-RCTs

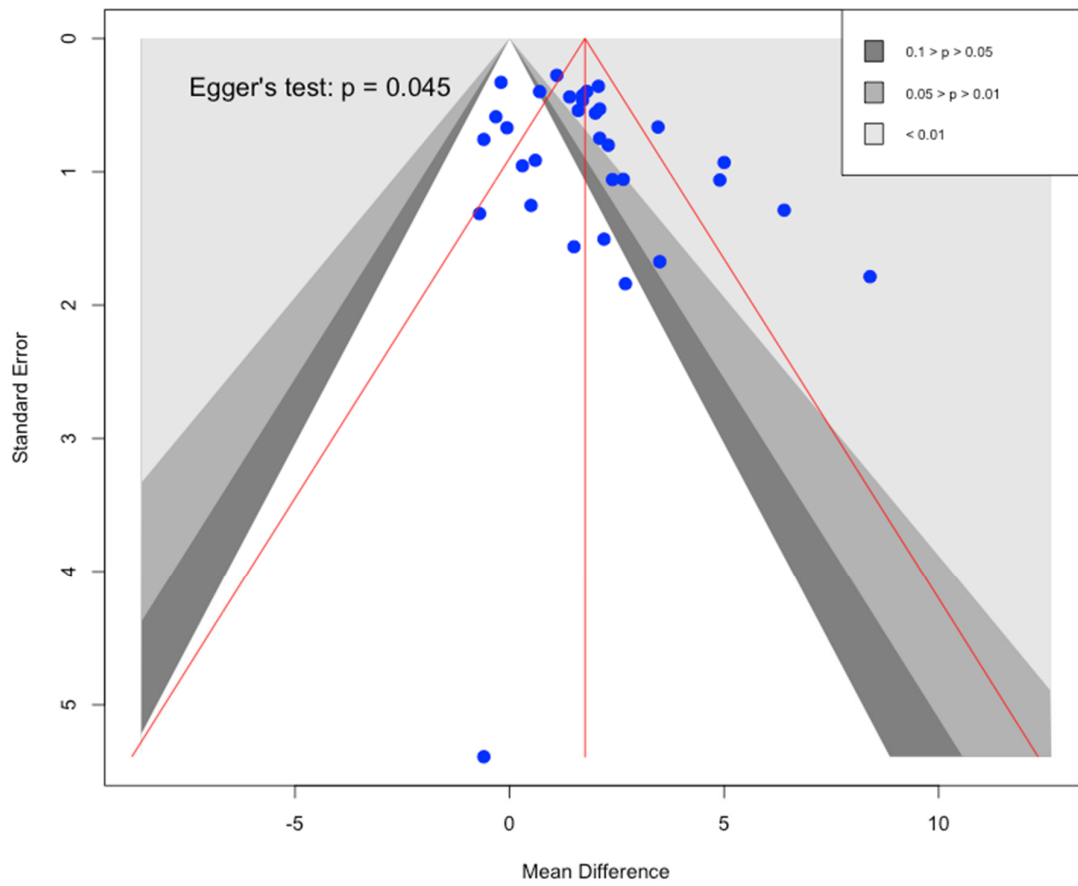


		Risk of bias domains							
		D1	D2	D3	D4	D5	D6	D7	Overall
Study	Gutierrez 2005	+	+	+	+	+	+	+	+
	Hwang 2006	-	-	-	+	-	+	-	-
	Kim 2013	-	-	+	+	-	+	-	-
	McMahon 1999	+	+	+	+	+	+	+	+
	Nandipati 2006	-	-	-	-	+	+	+	-
	Ozidal 2008	-	+	+	+	+	+	+	-
	Palmieri 2020	-	+	-	+	+	+	+	-
	Sebastianelli 2019	+	+	+	+	+	+	+	+

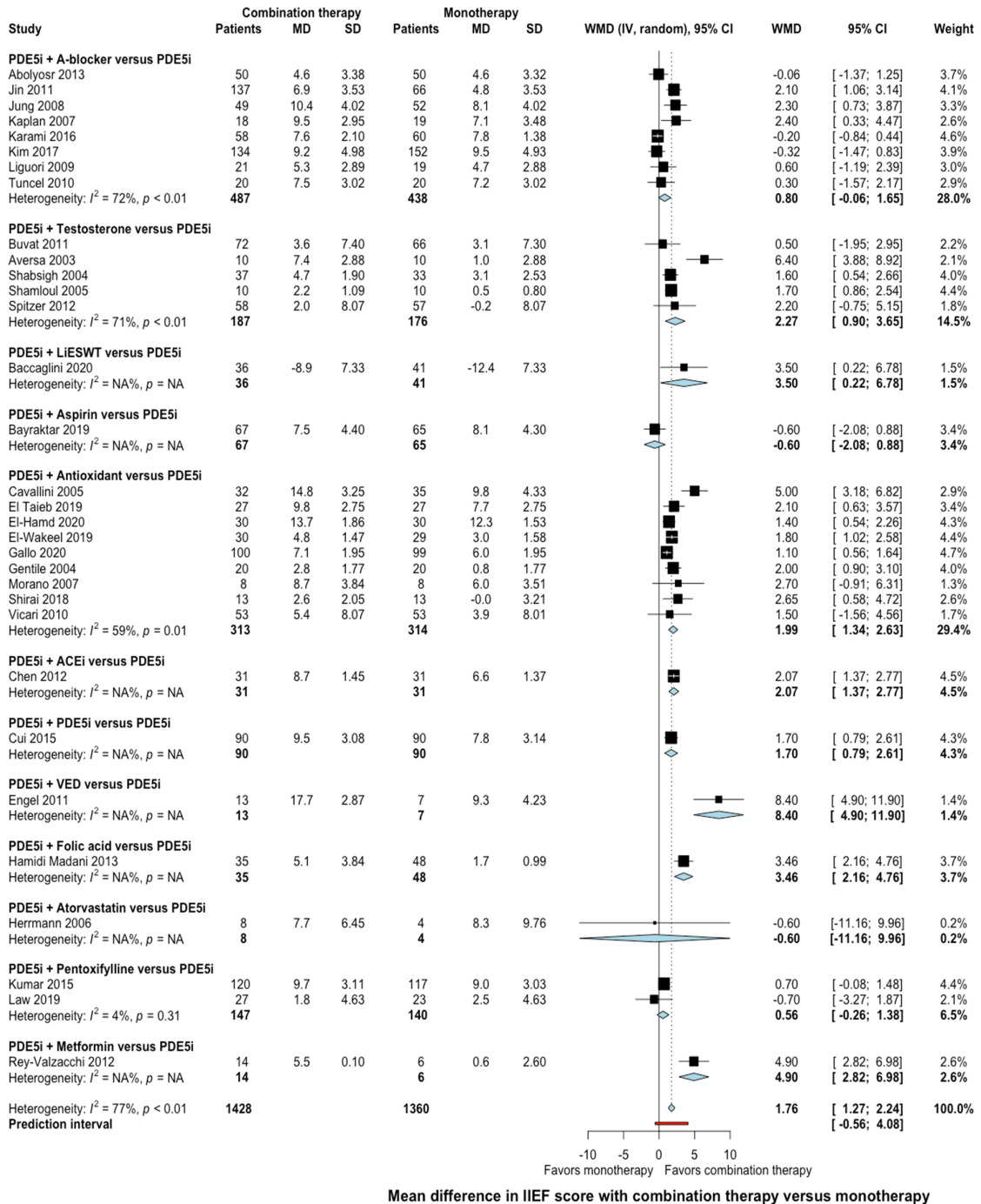
Domains:  
D1: Bias due to confounding.  
D2: Bias due to selection of participants.  
D3: Bias in classification of interventions.  
D4: Bias due to deviations from intended interventions.  
D5: Bias due to missing data.  
D6: Bias in measurement of outcomes.  
D7: Bias in selection of the reported result.

Judgement  
- Moderate  
+ Low

**eAppendix 6.** Publication Bias Assessment With Funnel Plot and Egger's Test



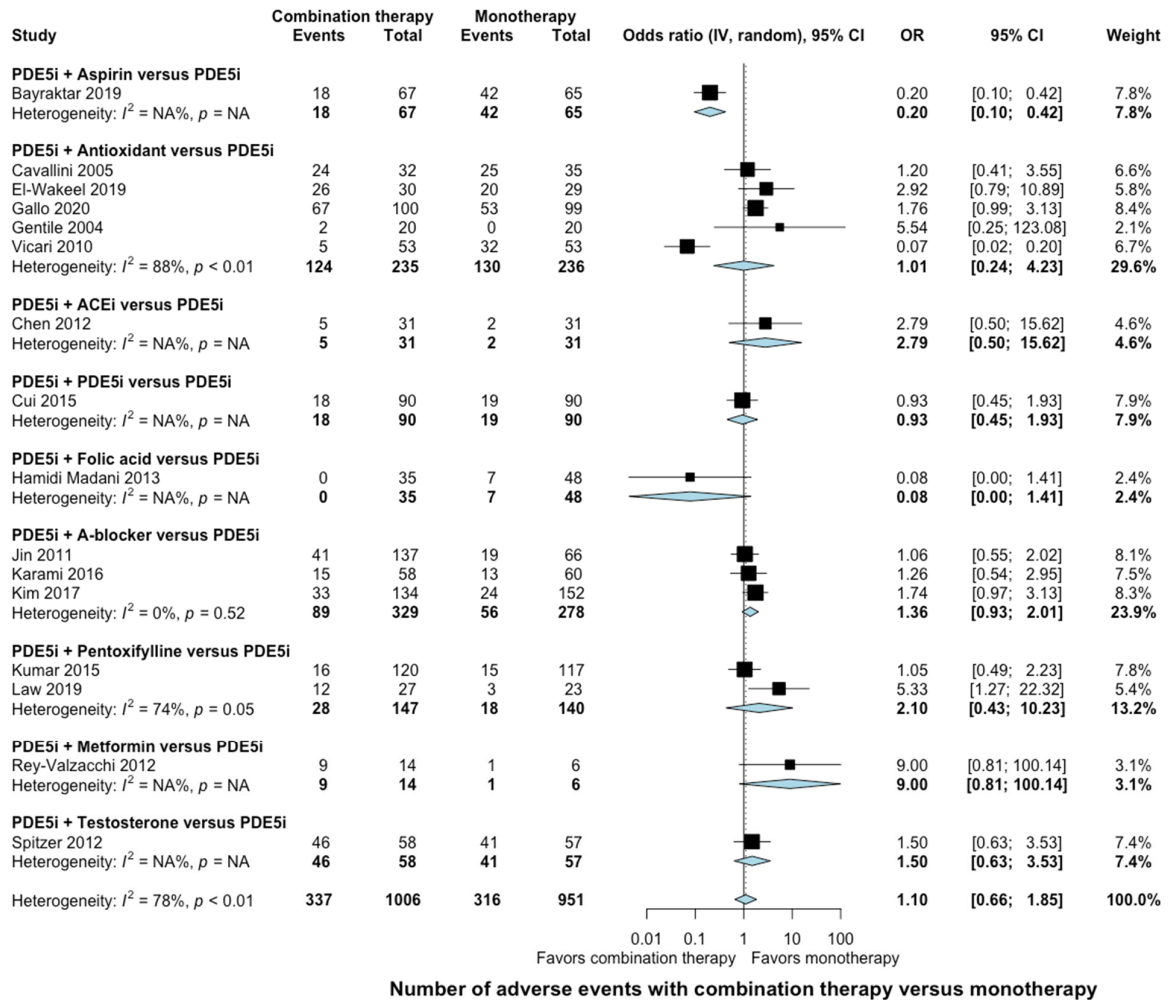
## eAppendix 7. Efficacy Based on Treatment Modality



Forest plot of the mean difference in IIEF score regarding different combination therapies versus PDE5i monotherapy with single study estimates. ACEi: angiotensin converting enzyme inhibitor; CI: confidence interval; ED: erectile dysfunction; IIEF: international index of erectile function; IV: inverse variance; Li-ESWT: low-intensity extracorporeal shockwave therapy; MD: mean difference; PDE5i: phosphodiesterase type 5 inhibitors; SD: standard deviation; VED: vacuum erectile device; WMD: weighted mean difference.

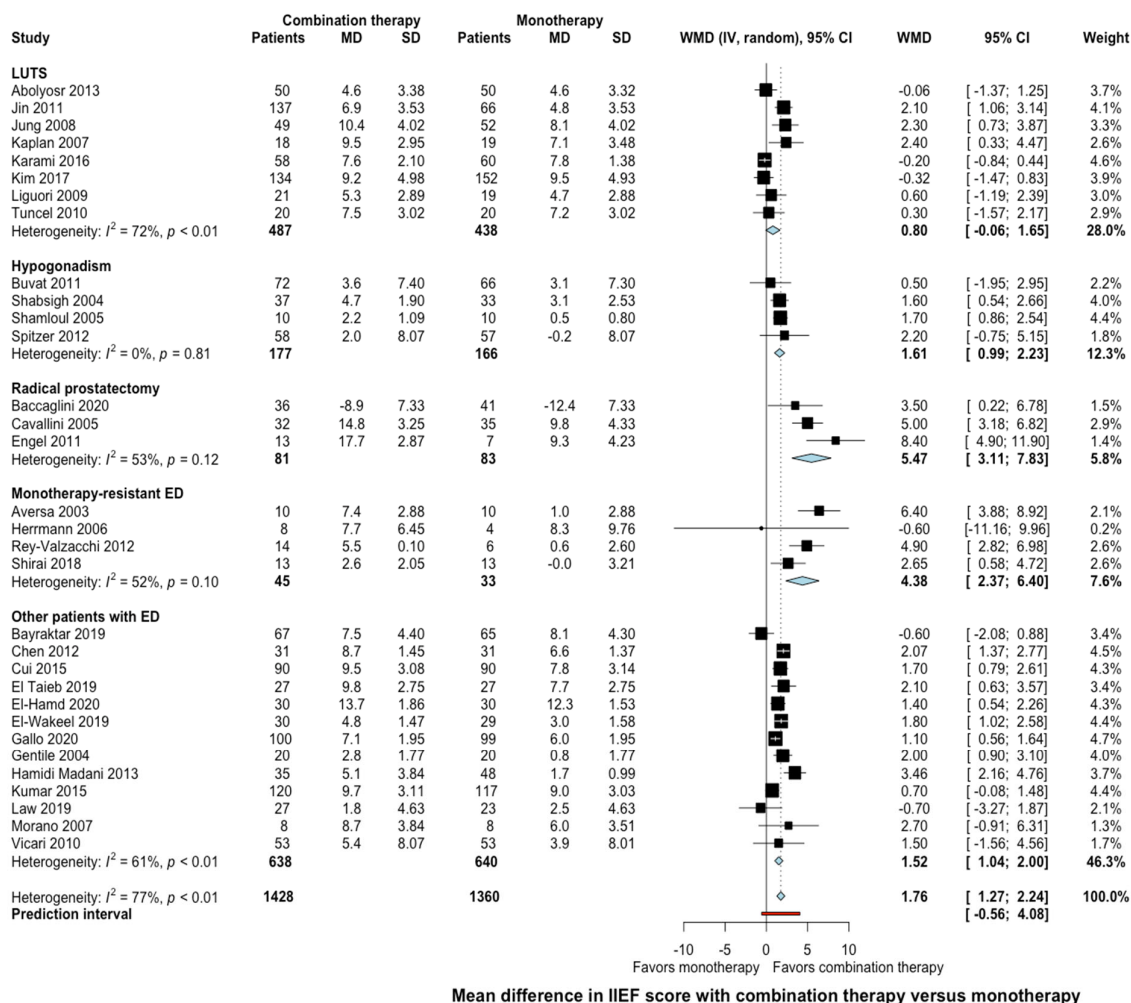


## eAppendix 8. Adverse Events Based on Treatment Modality



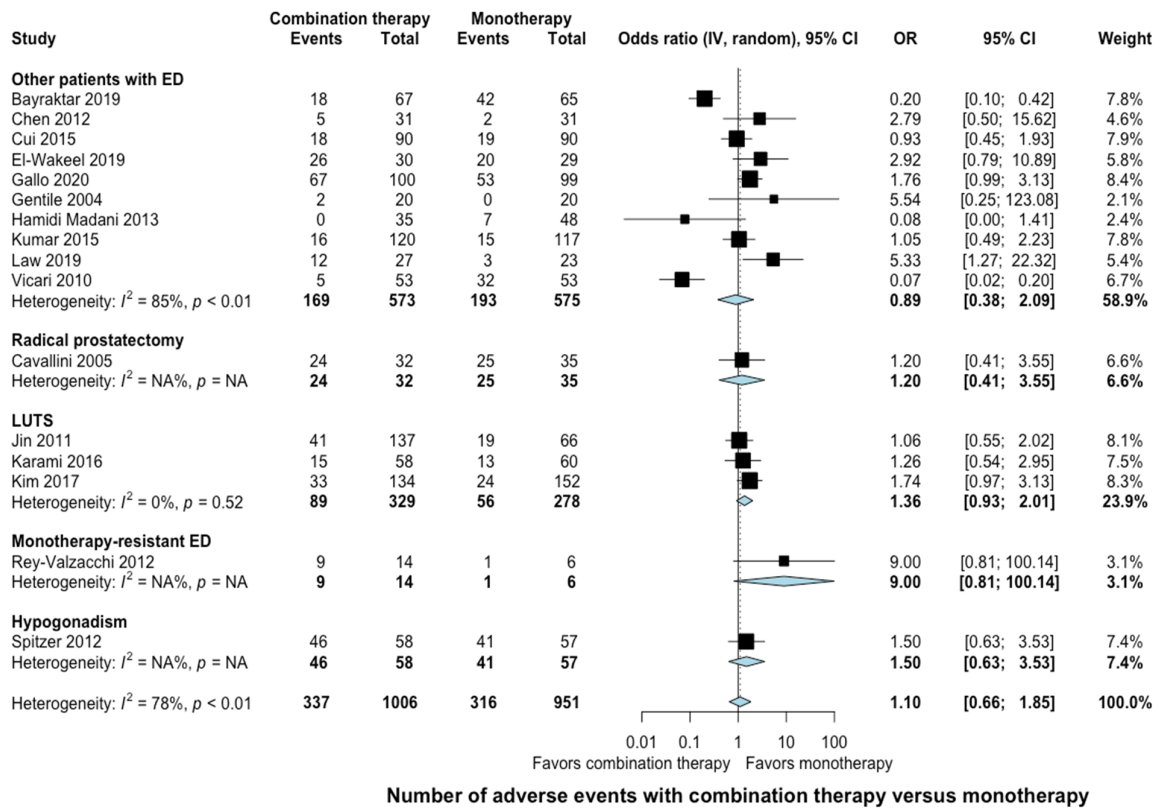
Forest plot of the adverse events regarding different combination therapies versus PDE5i monotherapy. ACEi: angiotensin converting enzyme inhibitor; CI: confidence interval; ED: erectile dysfunction; IV: inverse variance; OR: odds ratio; PDE5i: phosphodiesterase type 5 inhibitors.

## eAppendix 9. Efficacy Based on Impotent Subpopulation



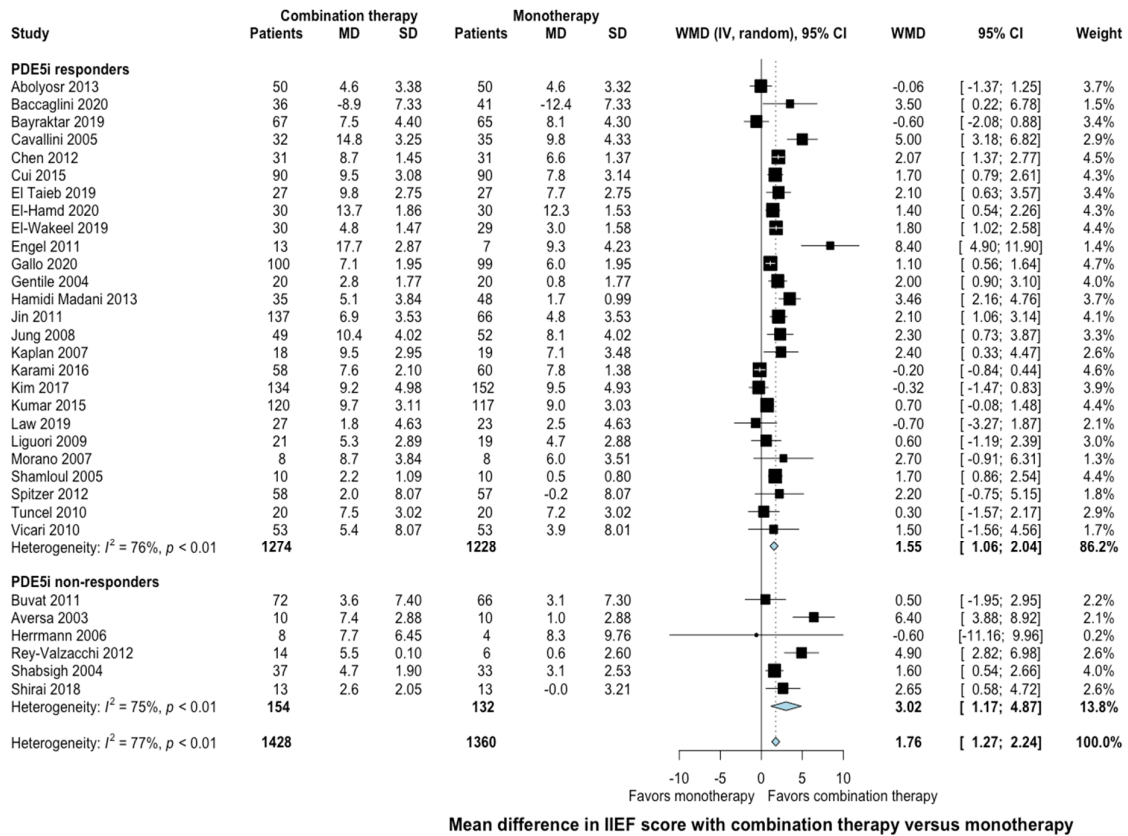
Forest plot of the mean difference in IIEF score with combination therapies versus PDE5i monotherapy in all identified subgroups with single study estimates. CI: confidence interval; ED: erectile dysfunction; IIEF: international index of erectile function; IV: inverse variance; LUTS: lower urinary tract symptoms; MD: mean difference; SD: standard deviation; WMD: weighted mean difference.

## eAppendix 10. Adverse Events Based on Impotent Subpopulation



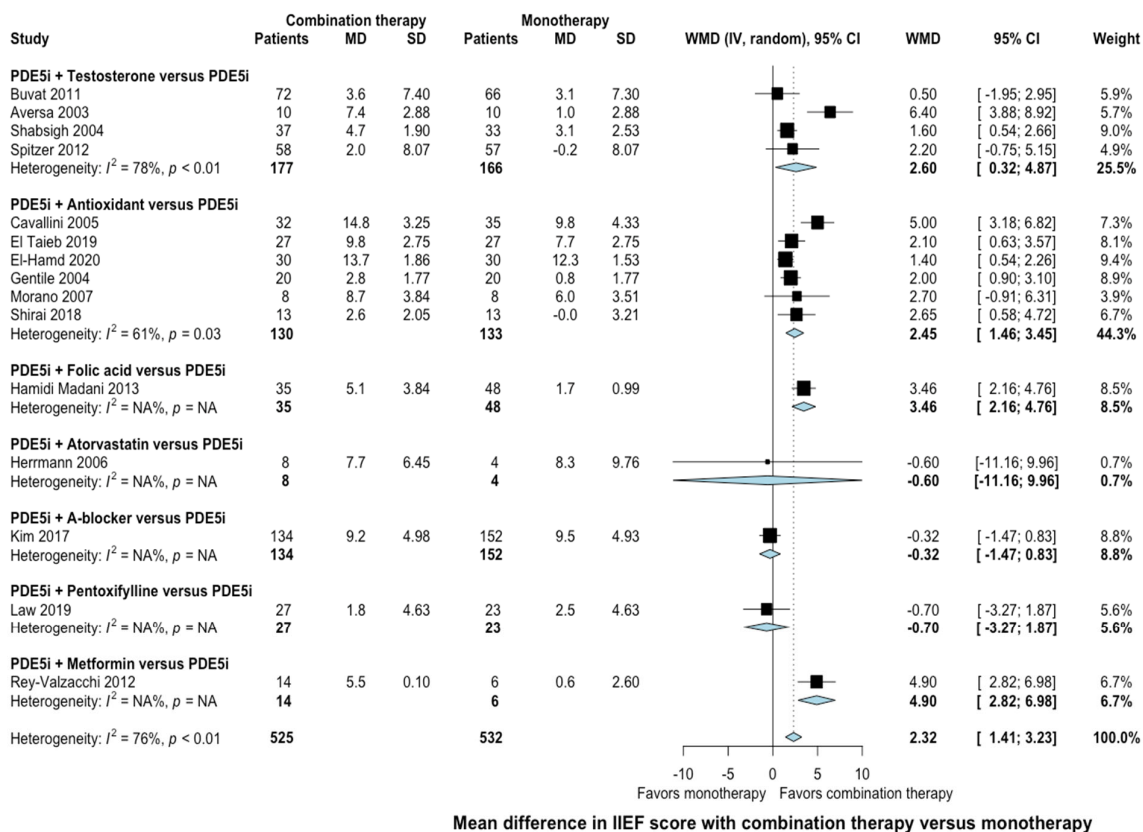
Forest plot of the adverse events with combination therapies versus PDE5i monotherapy in all identified subgroups. CI: confidence interval; ED: erectile dysfunction; IV: inverse variance; LUTS: lower urinary tract symptoms; OR: odds ratio.

## eAppendix 11. Subgroup Analysis According to PDE5i Response



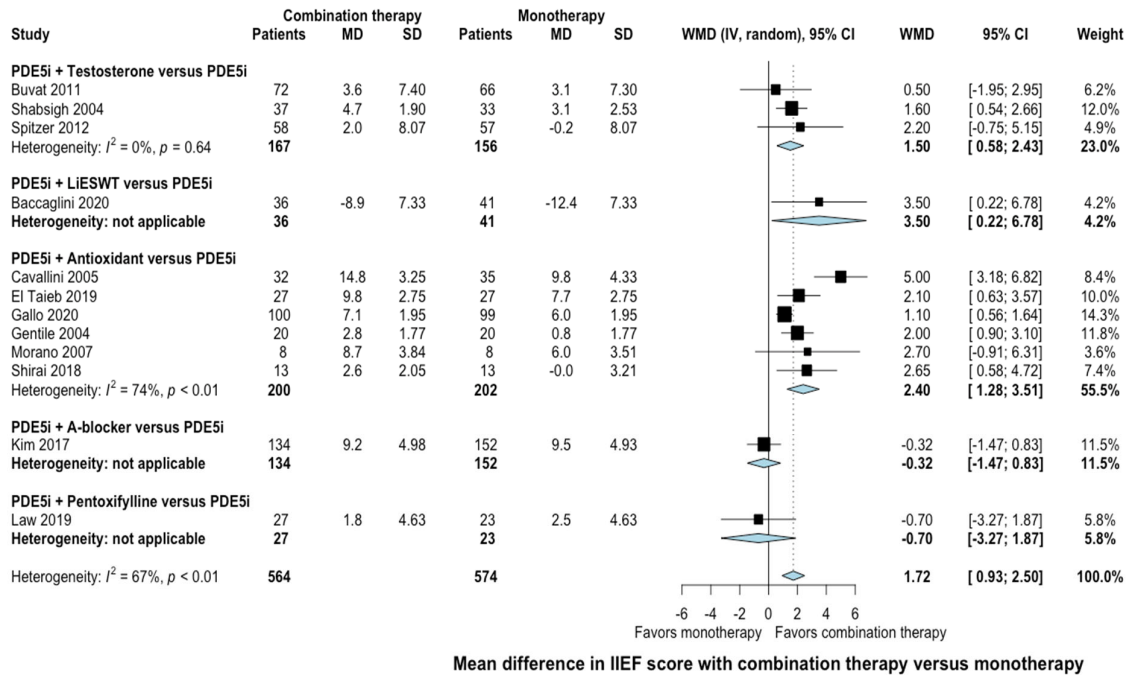
Subgroup analysis comparing PDE5i responders and non-responders for the mean difference in IIEF score with combination therapy versus PDE5i monotherapy. CI: confidence interval; ED: erectile dysfunction; IIEF: international index of erectile function; IV: inverse variance; PDE5i: phosphodiesterase type 5 inhibitors; RCT: randomized controlled trial; WMD: weighted mean difference.

## eAppendix 12. Sensitivity Analysis Including Placebo-Controlled RCTs



Sensitivity analysis including placebo controlled RCTs for the mean difference in IIEF score with combination therapy versus PDE5i monotherapy. CI: confidence interval; ED: erectile dysfunction; IIEF: international index of erectile function; IV: inverse variance; MD: mean difference; PDE5i: phosphodiesterase type 5 inhibitors; RCT: randomized controlled trial; SD: standard deviation; WMD: weighted mean difference.

### eAppendix 13. Sensitivity Analysis Including Studies at Low Risk of Bias



Sensitivity analysis including studies at low risk of bias for the mean difference in IIEF score with combination therapy versus PDE5i monotherapy. CI: confidence interval; ED: erectile dysfunction; IIEF: international index of erectile function; IV: inverse variance; MD: mean difference; PDE5i: phosphodiesterase type 5 inhibitors; RCT: randomized controlled trial; SD: standard deviation; WMD: weighted mean difference.

## eAppendix 14. Grading of Evidence

### Combination therapy versus monotherapy

Certainty assessment							№ of patients		Effect		Certainty	Importance
№ of studies	Study design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Combination therapy	Monotherapy	Relative (95% CI)	Absolute (95% CI)		
<b>Mean IIEF change from baseline</b>												
32	randomized trials	not serious	serious <sup>a</sup>	serious <sup>b</sup>	not serious	dose response gradient	1428	1360	Not applicable	MD <b>1.76 higher</b> (1.27 higher to 2.24 higher)	⊕⊕⊕○ MODERATE	CRITICAL
<b>Number of adverse events</b>												
16	randomized trials	not serious	serious <sup>a</sup>	serious <sup>b</sup>	not serious	dose response gradient	337/1006 (33.5%)	316/951 (33.2%)	<b>OR 1.10</b> (0.66 to 1.85)	<b>21 more per 1,000</b> (from 85 fewer to 147 more)	⊕⊕⊕○ MODERATE	CRITICAL

CI: Confidence interval; MD: Mean difference; OR: Odds ratio

#### Explanations

- a. statistically significant heterogeneity among studies
- b. different study populations among studies