Table F-2. Key findings in studies of methylphenidate

Table F-2. Key findings in studi	es of methylphen	iidate	
Author, Year Study Design	Mean age, years ± SD	Outcome measure/Baseline	Outcome measure/Post-
Groups (dose), N enrollment / N final	Mean IQ ±SD	scores, mean ±SD	treatment scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
RUPP 2005 <sup>33-36</sup> RCT  G1: Methylphenidate - low dose (0.125 mg/kg), 66/45 G2: Methylphenidate - medium dose (0.250 mg/kg), 66/52 G3: Methylphenidate - high dose (0.500 mg/kg), 66/33 G4: Methylphenidate - optimal dose (NA), 66/58 G5: Placebo (NA), 66/46  13 weeks/EOT Low RoB	Age G1+G2+G3+G4+ G5: 7.5 IQ NR	Overall ratings: CGI severity subscale rating, n (%): Moderately ill: 20 (30.3)  Markedly ill: 35 (52.0)  Severely ill: 11 (16.7)  Educational/cognitive/academic attainment: Slosson IQ, mean ± SD (range): 62.6 ± 32.9 (16-135)  Social skills: VABS score, mean ± SD (range):† Socialization: 61.7 ± 16.7 (20-109)  Communication/language: VABS Communication/language: VABS Communication: 62.8 ± 21.8 (20-126)  Adaptive behavior: VABS composite: 56.2 ± 21.0 (20-109)  VABS Daily living skills: 54.4 ± 19.8 (20-110)  Problem behavior: ABC score, parentrated, mean ± SD (range):† Irritability: 16.9 ± 10.1 (0-41) Lethargy/social withdrawal: 12.1 ± 8.9 (0-33)	Overall ratings: Responded to treatment, subjects completing cross-over phase, n (%): Total: 44 (76)  Optimal/best treatment:† Placebo: 9 (20) Low: 11 (25) Medium: 14 (32) High: 10 (23)  Response rate, by dose, n (%):† G1: 20/61 (33) G2: 27/77 (35) G3: 18/47 (38) G5: 12/61 (20) G1/G5: P = 0.05 (including first medium dose) G2/G5: P = 0.06 (including first and second medium dose when applicable) G3/G5: P = 0.07  Social skills:^ Joint attention (n=33), mean ± SD  Initiations: G1: 23.29 ± 16.62 G2: 20.85 ± 13.01 G3: 19.27 ± 14.23 G4: 25.09 ± 15.55 G5: 18.59 ± 12.03 G1/G5: P < 0.05 G2/G5: P = NS
		12.1 2 0.0 (0 00)	<b>G3/G5</b> : <i>P</i> = NS

Author, Year	Mean age, years	Outcome	Outcome
Study Design	± SD	measure/Baseline	measure/Post-
		scores, mean ±SD	treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD		scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
		Stereotypy: 7.6 ± 5.9 (0-21)	<b>G4/G5</b> : <i>P</i> < 0.05
		Hyperactivity:	Responses: <b>G1:</b> 2.48 ± 1.45
		33.2 ± 8.7 (2-47)	<b>G2:</b> 1.69 ± 1.42
		(=)	<b>G3:</b> 1.93 ± 1.48
		Inappropriate	<b>G4:</b> 2.24 ± 1.69
		speech: 6.0 ± 4.1 (0-12)	<b>G5</b> : 1.90 ± 1.71 <b>G1/G5</b> : <i>P</i> < 0.01
		0.0 ± 4.1 (0-12)	<b>G2/G5</b> : <i>P</i> = NS
		ABC score, teacher-	<b>G3/G5</b> : <i>P</i> = NS
		rated, mean ± SD (range):†	<b>G4/G5:</b> <i>P</i> = NS
		Irritability:	Requesting:
		16.1 ± 9.4 (0-43)	G1: 4.04 ± 2.25 G2: 3.81 ± 2.65
		Lethargy/social	G3: 3.69 ± 3.27
		withdrawal:	G4: 4.13 ± 2.58
		15.5 ± 10.9 (0-42)	G5: 3.67 ± 2.40 G1/G5: P = NS
		Stereotypy:	G2/G5: P = NS
		7.6 ± 5.1 (0-19)	G3/G5: P = NS G4/G5: P = NS
		Hyperactivity: 30.9 ± 7.9 (16-45)	Competing
		30.9 ± 7.9 (10-43)	demands task
		Inappropriate	(n=33), mean ±
		speech: 5.8 ± 3.6 (0-12)	SD: Self-regulating
		3.0 ± 3.0 (0-12)	behavior:
		SNAP-IV, parent-	G1: 19.77 ±
		rated, mean ± SD:*	10.89 G2: 16.21
		ADHD: 39.82 ± 8.09	± 9.03 G3: 15.80 ± 12.65
		00.02 ± 0.03	G4: 16.47 ±
		Inattention:	13.91
		20.21 ± 5.17	G5: 12.47 ± 11.29 G1/G5: P
		Hyperactivity/	= 0.09
		impulsivity: 19.61 ± 4.22	G2/G5: P < 0.01 G3/G5: P = NS
			G3/G5: P = NS G4/G5: P = 0.09
		Oppositional defiant	De muleto !
		disorder: 9.61 ± 6.19	Regulated affective state:
		SNAP-IV, teacher-	G1: 12.91 ± 4.98
		rated, mean ± SD:*	G2: 12.96 ± 3.85
		ADUD.	G3: 11.67 ± 5.53
		ADHD: 37.23 ± 7.04	G4: 12.47 ± 4.99 G5: 9.57 ± 6.72
		J1.2J ± 1.U4	G5. 9.57 ± 6.72 G1/G5: P = NS
		Inattention:	G2/G5: P < 0.05

Author, Year	Mean age, years	Outcome	Outcome
Study Design	± SD	measure/Baseline	measure/Post-
Groups (dose), N enrollment / N final	Mean IQ ±SD	scores, mean ±SD	treatment scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
		19.30 ± 4.32	G3/G5: P < 0.05 G4/G5: P = 0.09
		Hyperactivity/ impulsivity: 17.93 ± 4.81	Clean-up task (n=33), mean ± SD:
		Oppositional defiant disorder: 8.83 ± 5.19	Compliance behaviors: G1: 3.67 ± 4.87
		CYBOCS-PDD, clinician-rated, mean ± SD:* 13.30 ± 3.74 VABS Maladaptive behaviors total:	G2: 3.67 ± 5.64 G3: 4.06 ± 4.55 G4: 3.94 ± 4.88 G5: 3.47 ± 5.41 G1/G5: P = NS G2/G5: P = NS G3/G5: P = NS G4/G5: P = NS
		29.2 ± 9.2 (13-51) Motor skills: 69.2 ± 17.8 (44-113)	Regulated affective state: G1: 8.10 ± 5.18 G2: 6.88 ± 4.86 G3: 6.65 ± 6.03 G4: 7.42 ± 5.05 G5: 7.33 ± 4.86 G1/G5: P = NS G2/G5: P = NS G3/G5: P = NS G4/G5: P = NS
			Repetitive behavior:† See notes Problem behavior: ABC- hyperactivity subscale score, mean ± SD:† Parent-rated: G1: 23.0 ± 11.29 G2: 20.6 ± 10.27 G3: 22.1 ± 9.67 G4: 17.2 ± 9.87 G5: 26.0 ± 9.90 G1/G5: P = 0.03 (es = 0.29) G2/G5: P < 0.001 (es = 0.54) G3/G5: P = 0.003 (es = 0.40) G4/G5: P <

Moon ogo voore	Outcomo	Outcomo
		Outcome measure/Post-
	scores, mean ±SD	treatment
Mean IQ ±SD	·	scores, mean ± SD
		0.001  (es = 0.89)
		Teacher-rated: G1: 22.9 ± 12.84 G2: 23.6 ± 12.53 G3: 20.3 ± 11.94 G4: 20.1 ± 12.40 G5: 26.0 ± 11.66 G1/G5: P = 0.03 (es = 0.25) G2/G5: P = 0.008 (es = 0.20) G3/G5: P = 0.002 (es = 0.48)
		G4/G5: P < 0.001 (es = 0.48)
		SNAP-IV inattention, mean ± SD:*
		Parent-rated: G1: 14.58 ± 6.56 G2: 13.38 ± 6.48 G3: 14.30 ± 6.35 G4: 11.83 ± 6.02 G5: 15.59 ± 6.51 G1/G5: P = 0.15 (es = 0.15) G2/G5: P < 0.001 (es = 0.34) G3/G5: P = 0.06 (es = 0.20) G4/G5: P < 0.001 (es = 0.60)
		Teacher-rated: G1: 15.24 ± 6.34 G2: 14.27 ± 6.93 G3: 14.67 ± 6.88 G4: 13.98 ± 6.46 G5: 16.15 ± 6.10 G1/G5: P = 0.21 (es = 0.15) G2/G5: P < 0.001 (es = 0.29) G3/G5: P = 0.02 (es = 0.23) G4/G5: P = 0.003 (es = 0.35)
		SNAP-IV
	Mean age, years ± SD  Mean IQ ±SD	± SD measure/Baseline scores, mean ±SD

Author, Year Study Design	Mean age, years ± SD	Outcome measure/Baseline scores, mean ±SD	Outcome measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD	Scores, mean 13D	scores, mean ±
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
			hyperactivity/ impulsivity, mean ± SD:* Parent-rated: G1: 13.39 ± 5.87 G2: 12.19 ± 6.06 G3: 13.49 ± 6.41 G4: 10.80 ± 5.99 G5: 15.33 ± 5.81 G1/G5: P = 0.02 (es = 0.33) G2/G5: P < 0.001 (es = 0.53) G3/G5: P = 0.01 (es = 0.30) G4/G5: P < 0.001 (es = 0.77) Teacher-rated: G1: 12.76 ± 6.84 G2: 13.00 ± 6.71 G3: 11.45 ± 7.01 G4: 11.26 ± 6.26 G5: 14.41 ± 6.095 G1/G5: P = 0.08 (es = 0.24) G2/G5: P = 0.01 (es = 0.21) G3/G5: P = 0.005 (es = 0.42) G4/G5: P = 0.005 (es = 0.42) G4/G5: P = 0.005 (es = 0.48) SNAP-IV oppositional defiant disorder, mean ± SD:* Parent-rated: G1: 6.77 ± 5.62 G2: 7.02 ± 5.90 G3: 7.53 ± 5.90 G4: 5.86 ± 4.70
			G5: 7.69 ± 5.80 G1/G5: P = 0.14 (es = 0.16)
			G2/G5: P = 0.25 (es = 0.12) G3/G5: P = 0.66
			(es = 0.03) G4/G5: P < 0.001 (es = 0.35)

Author, Year Study Design	Mean age, years ± SD	Outcome measure/Baseline scores, mean ±SD	Outcome measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD	Scores, mean ±3D	scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
			Teacher-rated: G1: $5.89 \pm 5.43$ G2: $6.65 \pm 5.10$ G3: $6.75 \pm 5.63$ G4: $5.61 \pm 4.85$ G5: $7.02 \pm 5.80$ G1/G5: P = 0.11 (es = 0.20) G2/G5: P = 0.17 (es = 0.07) G3/G5: P = 0.35 (es = 0.05) G4/G5: P = 0.04 (es = 0.26)
			CYBOCS-PDD, clinician-rated, mean ± SD:* G1: 12.82 ± 4.15 G2: 12.31 ± 4.27 G3: 13.02 ± 4.11 G4: 12.13 ± 4.22 G5: 13.05 ± 3.46 G1/G5: P = 0.90 (es = 0.06) G2/G5: P = 0.21 (es = 0.19) G3/G5: P = 0.80 (es = 0.01) G4/G5: P = 0.08 (es = 0.24)
			Commonly occurring comorbidities: SNAP-IV ADHD, mean ± SD:* Parent-rated: G1: 27.97 ± 11.62 G2: 25.57 ± 11.66 G3: 27.79 ± 11.63 G4: 22.63 ± 11.19 G5: 30.92 ± 11.55 G1/G5: P = 0.04 (es = 0.25) G2/G5: P <

Author, Year	Mean age, years	Outcome	Outcome
Study Design	± SD	measure/Baseline scores, mean ±SD	measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD	coords, main 200	scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
			0.001 (es = 0.46) G3/G5: P = 0.02 (es = 0.27) G4/G5: P < 0.001 (es = 0.73) Teacher-rated: G1: 28.00 ± 12.12 G2: 27.27 ± 12.21 G3: 26.12 ± 12.64 G4: 25.24 ± 11.53 G5: 30.57 ± 11.84 G1/G5: P = 0.21) G2/G5: P = 0.001 (es = 0.27) G3/G5: P = 0.005 (es = 0.36) G4/G5: P =
Pearson et al., 2013 <sup>37</sup>	Age	Parent Ratings	0.003 (es = 0.46) <b>EOT</b>
RCT	G1+G2+G3+G4: 8.8 ± 1.6	CPRS NR	Parent Ratings CPRS – CGI
G1: Methylphenidate - low dose (0.14-0.21 mg/kg), 24/24 G2: Methylphenidate - medium dose (0.24-0.35 mg/kg), 24/24	IQ NR	CPRS-ADHD scale G1+G2+G3+G4: 76.4 ± 6.7	Total G1: 61.9 ± 11.7 G2: 59.9 ± 9.8 G3: 55.8 ± 9.3
G3: Methylphenidate - high dose (0.27-0.48 mg/kg), 24/24		SNAP-IV NR	G4: 66.8 ± 12.7 G4 vs G2,
G4: Placebo (NA), 24/24 4 weeks/EOT		ACTeRS NR	p<0.05 G4 vs G3, p<0.05
Low RoB		ABC NR	G1 vs G3, p<0.05
		SCQ NR	CPRS –
		Teacher Ratings CTRS NR	Oppositional G1: 53.1 ± 15.3 G2: 53.8 ± 12.4 G3: 49.8 ± 11.4
		CTRS-ADHD scale G1+G2+G3+G4: 67.2 ± 8.7	G4: 59.2 ± 16 ANOVA p-value for all groups, p<0.05
		SNAP-IV NR	CPRS – Cognitive

Author, Year Study Design	Mean age, years ± SD	Outcome measure/Baseline scores, mean ±SD	Outcome measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD	Scores, mean 100	scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
		ACTeRS NR	Problems/Inatten tion G1: 67.7 ± 11.6 G2: 63.9 ± 12.5 G3: 60 ± 11.7 G4: 70.3 ± 12.8 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			CPRS – Hyperactivity G1: 62.6 ± 12.2 G2: 62.1 ± 12 G3: 58.3 ± 10.2 G4: 70.8 ± 15.2 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			CPRS - ADHD Index G1: 64.9 ± 9.3 G2: 62.3 ± 10 G3: 59.9 ± 10.5 G4: 70.1 ± 11.9 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			SNAP-IV – Inattentive/Hyper active G1: 26 ± 11.1 G2: 22.8 ± 9.6 G3: 21.6 ± 9.6 G4: 31.6 ± 11 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			ACTeRS – Attention G1: 12.4 ± 5.3 G2: 13.4 ± 5

Author, Year Study Design	Mean age, years ± SD	Outcome measure/Baseline scores, mean ±SD	Outcome measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD	Scores, mean 100	scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
			G3: 14 ± 4.2 G4:10.9 ± 4.7 G4 vs G3, p=ns
			ACTeRS – Hyperactivity G1: 13.3 ± 4.5 G2: 12 ± 4 G3: 12 ± 4.3 G4: 15.7 ± 4.5 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			ACTeRS – Social Skills G1: 13.3 ± 4.4 G2: 12 ± 3.7 G3: 14 ± 4.3 G4: 12.8 ± 4.5 G2 vs G3, p<0.05
			ACTeRS – Oppositional G1: $7.8 \pm 5.6$ G2: $6.8 \pm 4$ G3: $6.6 \pm 2.6$ G4: $8.4 \pm 5.3$ G4 vs G2, p<0.05
			ABC-Irritability G1: $10 \pm 9.2$ G2: $8.2 \pm 8.1$ G3: $7.2 \pm 6.9$ G4: $12.6 \pm 10.4$ G4 vs G3, p<0.05
			ABC-Social Withdrawal/Leth argy G1: $7.3 \pm 5.6$ G2: $8.1 \pm 5.9$ G3: $8.5 \pm 6.6$ G4: $9.3 \pm 8.1$ p=ns
			ABC-Stereotypy G1: 4.3 ± 4.5 G2: 4 ± 3.8 G3: 3.5 ± 3.8

Author, Year	Mean age, years	Outcome	Outcome
Study Design	± SD	measure/Baseline scores, mean ±SD	measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD		scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			04.40.54
			G4: 4.9 ± 5.4 p=ns
			ABC- Hyperactivity G1: 18.1 ± 10.5 G2: 14.5 ± 7.7 G3: 14.5 ± 9.2 G4: 24.1 ± 13 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			ABC- Inappropriate Speech G1: 4.3 ± 3.2 G2: 4 ± 3.1 G3: 3.9 ± 3.1 G4: 5.2 ± 3.1 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			SCQ – Total G1: 14.2 ± 6.6 G2: 15.2 ± 6.2 G3: 13.4 ± 6.2 G4: 15.5 ± 6.1 ANOVA p-value for all groups, p<0.05
			Teacher Ratings CTRS - CGI- Total G1: 63.4 ± 12.8 G2: 62.4 ± 12.5 G3: 59.3 ± 12.7 G4: 75.6 ± 11.5 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			CTRS- Oppositional

Author, Year Study Design	Mean age, years ± SD	Outcome measure/Baseline scores, mean ±SD	Outcome measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD	Scores, mean ±3D	scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
			G1: 56.6 ± 13.2 G2: 58.1 ± 15.4 G3: 55.1 ± 13.5 G4: 65.1 ± 19.5 p=ns
			CTRS-Cognitive Problems/Inatten tion G1: 58.3 ± 10.7 G2: 57.8 ± 9.5 G3: 59.3 ± 11.1 G4: 63 ± 11.2 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			CTRS- Hyperactivity G1: 59.9 ± 13.6 G2: 59.9 ± 11.4 G3: 57.7 ± 11.3 G4: 70.3 ± 13.5 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			CTRS-ADHD Index G1: 63.1 ± 11.2 G2: 63.6 ± 10.4 G3: 61.5 ± 13 G4: 72.8 ± 12 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			SNAP-IV – Inattentive/Hyper active G1: 24.7 ± 10.9

Author, Year Study Design	Mean age, years ± SD	Outcome measure/Baseline scores, mean ±SD	Outcome measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD	Scores, mean 100	scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
			G2: 23.7 ± 11.1 G3: 21.8 ± 11.6 G4: 32.7 ± 12.4 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			ACTeRS – Attention G1: 14.3 ± 6.2 G2: 13.7 ± 5.5 G3: 15.9 ± 8.5 G4: 11.3 ± 4 G4 vs G3, p<0.05
			ACTeRS – Hyperactivity G1: 11.8 ± 5.6 G2: 12.8 ± 5.5 G3: 11.2 ± 5 G4: 18.7 ± 5.2 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			ACTeRS – Social Skills G1: 19.2 ± 4.2 G2: 16.7 ± 4 G3: 18.5 ± 5.8 G4: 15.8 ± 3.6 p=ns
			ACTeRS – Oppositional G1: 7.6 ± 3.5 G2: 9.2 ± 5.5 G3: 7.1 ± 2.1 G4: 10.6 ± 5.8 G4 vs G3, p<0.05
			CGI-Severity (clinician 1) G1: 4 ± 0.81

Author, Year Study Design	Mean age, years ± SD	Outcome measure/Baseline scores, mean ±SD	Outcome measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD	Scores, mean ±3D	scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
			G2: 3.8 ± 0.82 G3: 3.8 ± 0.74 G4: 4.8 ± 0.61 G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			CGI- Improvement (clinician 1) G1: $2.8 \pm 1.3$ G2: $2.4 \pm 1.3$ G3: $2.1 \pm 1.2$ G4: $4 \pm 0.81$ G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			CGI-Severity (clinician 2) G1: $4 \pm 0.72$ G2: $4 \pm 0.62$ G3: $3.9 \pm 0.74$ G4: $4.7 \pm 0.76$ G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3, p<0.05
			CGI- Improvement (clinician 2) G1: $2.8 \pm 1.4$ G2: $2.6 \pm 1.3$ G3: $2 \pm 1$ G4: $4.1 \pm 0.95$ G4 vs G2, p<0.05
			G4 vs G3, p<0.05
			G1 vs G3,

Author, Year Study Design	Mean age, years ± SD	Outcome measure/Baseline scores, mean ±SD	Outcome measure/Post- treatment
Groups (dose), N enrollment / N final	Mean IQ ±SD		scores, mean ± SD
Treatment duration/Follow-up timepoint post-treatment			
Risk of Bias			
			p<0.05

ABC-Aberrant Behavior Checklist; CGI-Clinical Global Impression; VABS-Vineland Adaptive Behavior Scale; CYBOCS-PDD-Children's Yale-Brown Obsessive Compulsive Scale Modified for Pervasive Developmental Disorder; EOT-End of Treatment; VBS-Visual Analog Scale; CGAS-Children's Global Assessment Scale; SNAP-IV-; ADHD-Attention Deficit/Hyperactivity Disorder; CPRS-Conners Parent Rating Scale; ACTeRS-ADD-H Comprehensive Teacher Rating Scale; CTRS-Conners Teacher Rating Scale; SCQ-Social Communication Questionnaire