Appendix I. Details of conventional rehabilitation programme.

Training session	Components
Physiotherapy (total 1.5 h)	
Upper limb training (30 min)	Aim: enhance hand and arm functions Exercise: • Passive stretching and weight-bearing exercises • Assisted or active mobilizing exercises • Progressive resisted exercises • Task-oriented exercises
Lower limb training (60 min)	Aim: enhance balance, endurance and mobility Exercise: • Passive stretching and warm-up exercises • Assisted, active mobilizing, or progressive resisted exercises • Static or dynamic standing balance exercises • Functional mobility exercises • Gait exercises • Endurance exercises
Occupational therapy (1.5 h)	
Activities of daily living training	Aim: enhance daily living functions Daily task: • Grooming • Dressing • Toileting • Bathing • Dinning

Appendix II. Details of bilateral movement-based computer games.

Game (10 min each)	
Target hitting	Content: hitting single stationary target
	Aim: promote movement and coordination
Mosquito splat hitting	Content: hitting/interacting with multiple moving targets
	Aim: enhance directional control and reaction time
Popaloon	Content: interacting with stationary and moving targets or click on balloons to pop them
	Aim: enhance strength, endurance and timing strategy

Progression:

- Progression is directed by a registered physiotherapist based on whether the subject moves the paretic arm easily while completing the challenges and whether the subject feels fatigue after each game.

Level of complexity:

- Moving up the game levels (causal, intermediate and extreme) by decreasing target size and increasing moving speed.
- Decreasing mouse sensitivity (range 1–15) to increase fine movement control
- Adding weight to the handlebar (0.45 kg for each increment)

Appendix III. Linear mixed-effects models of the between-groups effects of bilateral movement-based computer games + conventional rehabilitation programme (BMCG + CR) and video-directed exercise and conventional rehabilitation programme (VDE + CR).

	Estimate	Standard error	*p*-value	95% CI	
FMA-UE: 0–66, higher better					
Month 1 (mid-intervention)	6.31	1.12	<0.001	4.07	8.54
Month 2 (post-intervention)	4.15	0.69	<0.001	2.79	5.52
Month (1 month follow-up)	2.93	0.55	<0.001	1.84	4.03
ARAT: 0–57, higher better					
Month 1 (mid-intervention)	4.39	1.70	0.012	1.01	7.77
Month 2 (post-intervention)	3.47	1.20	0.005	1.09	5.85
Month 3 (1 month follow-up)	2.51	0.80	0.002	0.92	4.09
GS, paretic					
Month 1 (mid-intervention)	2.27	0.55	<0.001	2.23	3.77
Month 2 (post-intervention)	1.58	0.48	0.002	0.62	2.54
Month 3 (3-month follow-up)	0.86	0.34	0.014	0.18	1.55
GS, non-paretic					
Month 1 (mid-intervention)	2.27	0.54	<0.001	1.19	3.35
Month 2 (post-intervention)	1.58	0.48	0.001	0.62	2.53
Month 3 (3-month follow-up)	0.86	0.34	0.014	0.18	1.55
PCS: 0–100, higher better					
Month 1 (mid-intervention)	1.45	1.05	0.169	−0.63	3.53
Month 2 (post-intervention)	0.28	0.65	0.671	−1.01	1.56
Month 3 (1 month follow-up)	0.16	0.42	0.705	−0.68	0.99
MCS: 0–100, higher better					
Month 1 (mid-intervention)	1.54	1.77	0.386	−1.98	5.06
Month 2 (post-intervention)	0.91	0.88	0.306	−0.84	2.65
Month 3 (1 month follow-up)	0.94	0.73	0.203	−0.51	2.38

FMA-UE: Fugl-Meyer Assessment of Upper Extremity; ARAT: Action Research Arm Test; GS: Grip Strength; PCS: Physical Component Summary; MCS: Mental Component Summary; 95% CI: 95% confidence interval.

Appendix IV. Linear mixed-effects models of the within-group effects of bilateral movement-based computer games + conventional rehabilitation programme (BMCG + CR) and video-directed exercise and conventional rehabilitation programme (VDE + CR).

	Estimate	Standard error	*p*-value	95% CI	
FMA-UE					
BMCG + CR					
Month 1 (mid-intervention) vs Baseline	9.96	0.79	< 0.001	8.07	11.53
Month 2 (post-intervention) vs Baseline	7.41	0.48	< 0.001	6.47	8.36
Month 3 (1 month follow-up) vs Baseline	5.87	0.38	< 0.001	5.11	6.63
Maintenance effects					
Month 2 (post-intervention) vs Month 3 (1 month follow-up)	2.71	0.40	< 0.001	1.92	3.52
VDE + CR					
Month 1 vs Baseline	3.66	0.80	< 0.001	2.07	5.24
Month 2 vs Baseline	3.26	0.49	< 0.001	2.28	4.24
Month 3 vs Baseline	2.94	0.40	< 0.001	2.04	3.84
Maintenance effects					
Month 2 vs month 3	2.27	0.42	0.45	1.44	3.10
ARAT					
BMCG + CR					
Month 1 (mid-intervention) vs Baseline	8.70	1.20	< 0.001	6.32	11.07
Month 2 (post-intervention) vs Baseline	6.91	0.83	< 0.001	5.26	8.57
Month 3 (1 month follow-up) vs Baseline	5.38	0.56	< 0.001	4.28	6.49
Maintenance effects					
Month 2 vs month 3	2.65	0.64	< 0.001	1.37	3.92
VDE + CR					
Month 1 (mid-training) vs Baseline	4.31	1.21	0.001	1.09	6.71
Month 2 (post-training) vs Baseline	3.44	0.86	< 0.001	1.73	5.15
Month 3 (1 month follow-up) vs Baseline	2.51	0.80	0.002	0.92	4.09
Maintenance effects					
Month 2 vs month 3	1.77	0.67	0.010	0.44	3.10
GS, paretic					
BMCG + CR					
Month 1 (mid-training) vs Baseline	8.67	2.55	0.001	3.60	13.73
Month 2 (post-training) vs Baseline	2.46	0.34	< 0.001	1.79	3.12
Month 3 (1 month follow-up) vs Baseline	1.80	0.24	< 0.001	0.18	1.55
Maintenance effects					
Month 2 vs month 3	0.45	0.49	0.359	0.52	1.42
VDE + CR					
Month 1 (mid-training) vs Baseline	0.73	0.39	0.063	0.042	1.51
Month 2 (post-training) vs Baseline	0.88	0.35	0.013	0.19	1.57
Month 3 (1 month follow-up) vs Baseline	0.93	0.25	< 0.001	0.44	1.42
Maintenance effects					
Month 2 vs Month 3	0.99	0.50	0.050	0.00	1.99
GS, non-paretic					
BMCG + CR					
Month 1 (mid-training) vs Baseline	3.01	0.38	< 0.001	2.25	3.77
Month 2 (post-training) vs Baseline	2.46	0.33	< 0.001	1.79	3.12
Month 3 (1 month follow-up) vs Baseline	1.80	0.24	< 0.001	1.32	2.27
Maintenance effects					
Month 2 vs month 3	0.45	0.48	0.353	0.51	1.41
VDE + CR					
Month 1 (mid-training) vs Baseline	0.73	0.39	0.063	0.04	1.51
Month 2 (post-training) vs Baseline	0.88	0.35	0.013	0.19	1.57
Month 3 (1 month follow-up) vs Baseline	0.93	0.25	< 0.001	0.44	1.42
Maintenance effects					
Month 2 vs Month 3	0.99	0.50	0.050	0.00	1.99
PCS					
BMCG + CR					
Month 1 (mid-training) vs Baseline	3.58	0.74	< 0.001	2.12	5.04
Month 2 (post-training) vs Baseline	1.88	0.45	< 0.001	0.99	2.78
Month 3 (1 month follow-up) vs Baseline	1.57	0.29	< 0.001	0.99	2.15
Maintenance effects					
Month 2 vs Month 3	0.06	0.78	0.938	-1.62	1.50
VDE + CR					
Month 1 (mid-training) vs Baseline	2.13	0.74	0.005	0.65	3.61
Month 2 (post-training) vs Baseline	1.61	0.47	0.001	0.68	2.53
Month 3 (1 month follow-up) vs Baseline	1.41	0.30	< 0.001	0.81	2.01
Maintenance effects					
Month 2 vs month 3	0.06	0.78	0.938	-1.50	1.62
MCS					
BMCG + CR					
Month 1 (mid-training) vs Baseline	3.67	1.25	0.004	1.19	6.14
Month 2 (post-training) vs Baseline	2.46	0.61	< 0.001	1.25	3.68
Month 3 (3-month follow-up) vs Baseline	2.56	0.51	< 0.001	1.55	3.57
Maintenance effects					
Month 2 vs month 3	2.62	1.08	0.017	0.47	4.77

(Contined)

Appendix IV (continues...). Linear mixed-effects models of the within-group effects of bilateral movement-based computer games + conventional rehabilitation programme (BMCG + CR) and video-directed exercise and conventional rehabilitation programme (VDE + CR).

	Estimate	Standard error	*p*-value	95% CI	
VDE + CR					
Month 1 (mid-training) vs Baseline	2.12	1.26	0.095	0.38	4.63
Month 2 (post-training) vs Baseline	1.56	0.63	0.015	0.30	2.81
Month 3 (1 month follow-up) vs Baseline	1.62	0.52	0.002	0.59	2.66
Maintenance effects					
Month 2 vs month 3	0.92	1.55	0.557	-4.01	2.17

FMA-UE: Fugl-Meyer Assessment of Upper Extremity; ARAT: Action Research Arm Test; GS: Grip Strength; PCS: Physical Component Summary; MCS: Mental Component Summary; BMCG + CR: bilateral movement-based computer game and conventional rehabilitation programme; VDE + CR: video-directed exercise and conventional rehabilitation programme; 95% CI: 95% confidence interval.

Appendix Va. One-way analysis of variance for upper limb capacity subgroups (classified by Fugl-Meyer Assessment of Upper Extremity (FMA-UE) score)

		Moderate to Severe Impairment (FMA-UE 0 to 39)			Minimal to Mild Impairment (FMA-UE 40 to 66)		
		BMCG + CR (1) (n = 30)	VDE + CR (2) (n = 22)	F(1, 49), p-values	BMCG + CR (3) (n = 17)	VDE + CR (4) (n = 24)	F(1, 38), p-value
		Mean changes ± SD (95% CI)	Mean changes ± SD (95% CI)		Mean changes ± SD (95% CI)	Mean changes ± SD (95% CI)	
FMA-UE	Month 1 (mid-intervention)	10.1±7.73 (7.22, 12.98)	8.59±5.47 (5.78, 11.40)	12.20, 0.001	2.77±3.53 (1.21, 4.34)	4.17±3.09 (2.86, 5.47)	9.77, 0.003
	Month 2 (post-intervention)	15.10±9.18 (11.67, 18.53)	12.18±6.41 (8.88, 15.47)	18.87, <0.001	4.23±5.44 (1.81, 6.64)	7.42±3.63 (5.88, 8.95)	8.21, 0.007
	Month 3 (1 month follow-up)	17.80±10.49 (1.92, 13.88)	14.29±6.56 (10.92, 17.67)	12.48, 0.001	6.91±7.46 (3.60, 10.22)	8.75±4.64 (6.79, 10.71)	9.53, 0.004
ARAT	Month 1 (mid-intervention)	8.77±10.06 (5.01, 12.52)	7.47±7.24) (3.75, 11.19)	11.25, 0.002	1.00±2.67 (-0.18, 2.18)	6.92±8.12 (3.49, 10.34)	0.18, 0.67
	Month 2 (post-intervention)	14.47±14.07 (9.21, 19.72)	9.76±11.03 (4.10, 15.43)	10.57, 0.002	3.59±5.60 (1.11, 6.08)	8.25±9.83 (4.10, 12.40)	0.61, 0.44
	Month 3 (1 month follow-up)	17.03±14.39 (11.66, 22.40)	11.94±11.85 (5.85, 18.03)	9.69, 0.003	5.64±8.59 (1.83, 9.44)	9.33±9.68 (5.24, 13.42)	1.68, 0.20
GS, paretic	Month 1 (mid-intervention)	2.60±3.25 (1.38, 3.81)	3.38±2.65 (0.64, 2.02)	7.45, 0.009	0.43±2.14 (-0.52, 1.37)	0.97±1.86 (0.18, 1.75)	11.10, 0.002
	Month 2 (post-intervention)	4.76±5.89 (2.56, 6.96)	4.45±4.69 (2.04, 6.86)	8.00, 0.007	1.15±2.35 (0.50, 0.11)	2.11±3.21 (0.76, 3.47)	3.41, 0.07
	Month 3 (1 month follow-up)	4.76±5.03 (2.88, 6.64)	5.58±5.62 (2.69, 8.47)	6.98, 0.011	1.83±1.94 (0.41, 0.97)	3.14±3.81 (1.53, 4.75)	2.55, 0.12
GS, non-paretic	Month 1 (mid-intervention)	0.27±2.45 (-0.64, 1.19)	-0.03±2.93 (-1.54, 1.48)	0.16, 0.69	0.08±2.25 (-0.92, 1.08)	-1.33±3.20 (-2.69, 0.02)	2.49, 0.12
	Month 2 (post-intervention)	1.33±3.34 (0.08, 2.58)	1.20±3.99 (-0.85, 3.25)	0.35, 0.56	1.85±2.61 (0.69, 3.01)	-0.18±3.40 (-1.25, 1.62)	0.78, 0.38
	Month 3 (1 month follow-up)	1.52±3.40 (0.25, 2.79)	0.88±4.54 (-1.45, 3.22)	0.10, 0.75	1.25±2.78 (0.01, 2.48)	-0.66±3.34 (-2.06, 0.75)	1.58, 0.22
PCS	Month 1 (mid-intervention)	4.27±5.45 (2.24, 6.31)	1.90±4.52 (-0.42, 4.23)	0.88, 0.35	2.76±5.24 (0.44, 5.08)	1.45±4.03 (-0.25, 3.16)	0.10, 0.75
	Month 2 (post-intervention)	4.90±5.94 (2.68, 7.12)	1.19±7.11 (-2.46, 4.84)	0.58, 0.45	3.47±6.13 (0.75, 6.19)	2.24±4.56 (0.32, 1.76)	0.09, 0.77
	Month 3 (1 month follow-up)	5.49±6.39 (3.11, 7.88)	2.70±6.66 (-0.72, 6.13)	0.23, 0.63	4.47±5.98 (1.82, 7.12)	3.12±5.21 (0.92, 5.32)	0.01, 0.95
MCS	Month 1 (mid-intervention)	3.51±9.27 (0.05, 6.97)	3.35±7.96 (-0.74, 7.45)	0.85, 0.36	2.05±7.42 (-1.24, 5.34)	1.92±8.57 (-1.70, 5.54)	0.01, 0.93
	Month 2 (post-intervention)	4.04±9.96 (0.33, 7.76)	6.12±9.18 (1.40, 10.84)	0.31, 0.58	3.13±8.94 (-0.84, 7.09)	2.63±8.54 (-0.98, 6.23)	0.53, 0.47
	Month 3 (1 month follow-up)	6.50±11.72 (2.12, 10.87)	8.49±9.82 (3.44, 13.54)	0.99, 0.33	4.70±9.56 (0.46, 8.94)	4.06±10.27 (-0.28, 8.39)	0.54, 0.47

Mean changes: The mean difference in the changes from baseline.

p-values of intervention effect are obtained by analysis of covariance (ANCOVA) analysis adjusted with baseline effect.

ARAT: Action Research Arm Test; GS: Grip Strength; PCS: Physical Component Summary; MCS: Mental Component Summary.

Appendix Vb. One-way analysis of variance for post-stroke time subgroups (8 weeks or less and more than 8 weeks)

		Post-stroke time >8 weeks			Post-stroke ≤8 weeks after stroke		
		BMCG + CR (1) ($n=18$)	VDE + CR (2) ($n=21$)	F(1, 36), p-values	BMCG + CR (3) ($n=29$)	VDE + CR (4) ($n=25$)	F(1, 51), p-value
		Mean changes ± SD (95% CI)	Mean changes ± SD (95% CI)		Mean changes ± SD (95% CI)	Mean changes ± SD (95% CI)	
FMA-UE	Month 1 (mid-intervention)	8.94±6.94 (5.49, 12.40)	2.95±3.32 (1.44, 4.46)	16.68, <0.001	9.93±7.08 (7.24, 12.62)	3.96±3.36 (2.57, 5.35)	14.64, <0.001
	Month 2 (post-intervention)	14.17±8.49 (9.94, 18.39)	5.14±4.57 (3.06, 7.23)	25.74, <0.001	13.97±8.38 (10.78, 17.15)	6.52±5.01 (4.45, 8.59)	14.98, <0.001
	Month 3 (1 month follow-up)	16.83±9.92 (11.90, 21.77)	7.00±5.24 (4.61, 9.39)	22.22, <0.001	16.34±9.14 (12.87, 19.82)	8.60±6.84 (5.78, 11.42)	12.41, 0.001
ARAT	Month 1 (mid-intervention)	5.67±7.20 (2.08, 9.25)	2.48±2.68 (1.26, 3.69)	3.96, 0.05	9.93±9.83 (6.19, 13.67)	5.44±8.72 (1.84, 9.04)	3.47, 0.068
	Month 2 (post-intervention)	11.89±12.67 (5.59, 18.19)	4.29±4.91 (2.05, 6.52)	5.92, 0.020	13.31±13.60 (8.14, 18.48)	7.48±10.27 (3.24, 11.72)	3.62, 0.06
	Month 3 (1 month follow-up)	13.89±14.32 (6.77, 21.01)	6.19±6.03 (3.45, 8.94)	4.56, 0.040	16.00±13.36 (10.92, 21.08)	8.72±11.30 (4.06, 13.38)	5.45, 0.024
GS, paretic	Month 1 (mid-intervention)	2.43±3.21 (0.83, 4.03)	0.30±1.71 (−0.48, 1.08)	7.45, 0.010	3.16±2.95 (2.03, 4.28)	1.05±2.17 (0.16, 1.95)	8.26, 0.006
	Month 2 (post-intervention)	4.35±3.80 (2.47, 6.25)	1.41±3.25 (−0.07, 2.89)	6.15, 0.018	4.83±6.30 (2.43, 7.22)	1.85±2.51 (0.82, 2.89)	5.20, 0.027
	Month 3 (1 month follow-up)	5.54±4.41 (3.35, 7.73)	2.57±3.13 (1.14, 3.99)	6.49, 0.015	4.76±5.70 (2.59, 6.92)	2.47±3.15 (1.17, 3.77)	3.06, 0.09
GS, non-paretic	Month 1 (mid-intervention)	0.10±2.54 (−1.16, 1.36)	−0.48±±2.40 (−1.57, 0.61)	0.24, 0.63	0.20±2.69 (−0.82, 1.23)	−0.81±3.22 (−2.13, 0.52)	3.99, 0.05
	Month 2 (post-intervention)	1.62±2.56 (0.34, 2.89)	1.40±2.39 (0.31, 2.49)	0.08, 0.78	1.07±4.07 (−0.48, 2.62)	0.63±3.65 (−0.88, 2.13)	0.34, 0.56
	Month 3 (1 month follow-up)	0.99±2.52 (−0.27, 2.24)	1.00±2.32 (−0.06, 2.06)	0.002, 0.96	1.48±4.47 (−0.22, 3.17)	−0.37±3.71 (−1.91, 1.16)	3.70, 0.06
PCS	Month 1 (mid-intervention)	2.82±4.79 (0.43, 5.20)	3.42±4.02 (1.59, 5.25)	0.09, 0.77	3.79±5.50 (1.69, 5.88)	0.95±4.91 (−1.07, 2.98)	3.20, 0.080
	Month 2 (post-intervention)	4.90±5.82 (2.00, 7.79)	4.65±4.93 (2.41, 6.90)	0.12, 0.74	2.72±6.95 (0.08, 5.37)	1.30±5.29 (−0.88, 3.49)	0.28, 0.60
	Month 3 (1 month follow-up)	4.52±6.40 (1.34, 7.70)	5.26±5.69 (2.67, 7.85)	0.05, 0.82	4.47±6.76 (1.89, 7.04)	2.52±5.25 (0.35, 4.68)	0.38, 0.015
MCS	Month 1 (mid-intervention)	5.65±10.60 (0.38±10.92)	1.17±8.54 (−2.71, 5.06)	0.33, 0.57	2.09±7.21 (−0.66, 4.83)	2.67±7.53 (−0.44, 5.77)	0.014, 0.91
	Month 2 (post-intervention)	5.75±11.87 (−0.16, 11.65)	2.43±9.35 (−1.83, 6.68)	0.10, 0.76	4.20±8.13 (1.11, 7.29)	3.24±8.17 (−0.14, 6.61)	0.91, 0.34
	Month 3 (1 month follow-up)	8.66±11.07 (3.15, 14.16)	3.32±12.00 (−2.14, 8.78)	0.12, 0.73	6.32±11.05 (2.12, 10.53)	5.24±7.72 (2.06, 8.43)	1.23, 0.27

Mean changes: The mean difference in the changes from baseline.

p-values of intervention effect are obtained by analysis of covariance (ANCOVA) analysis adjusted with baseline effect.

FMA-UE: Fugl-Meyer Assessment of Upper Extremity; ARAT: Action Research Arm Test; GS: Grip Strength; PCS: Physical Component Summary; MCS: Mental Component Summary.