Supplementary Online Content

Winstein CJ, Wolf SL, Dromerick AW, et al; Interdisciplinary Comprehensive Arm Rehabilitation Evaluation (ICARE) Investigative Team. Effect of a task-oriented rehabilitation program on upper extremity recovery following motor stroke: the ICARE randomized clinical trial. *JAMA*. doi:10.1001/jama.2016.0276

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

eTable 1. Eligibility Criteria

INCLUSION

1. Ischemic or hemorrhagic stroke (subdural and epidural effusions permitted) within the previous 106 days
2. Hemiparesis (weakness) in arm or hand
3. Some active finger extension movement by close of enrollment window
4. Age 21+
5. Able to communicate in English
6. Willing to attend outpatient therapy and all study evaluations.

EXCLUSION

Neurologic symptoms or conditions

1. Traumatic or non-vascular brain injury, subarachnoid hemorrhage, AV malformation, subdural or epidural hematoma
2. Neurologic condition that may affect motor response (e.g. Parkinson's, ALS, MS)
3. Presence of ataxia per NIHSS and evidence of cerebellar or brainstem lesion
4. Absent upper extremity sensation per NIHSS
5. Neglect asymmetry > 3 per Mesulam Unstructured
6. A second stroke within the last 72 hours cannot be ruled out before the brief medical exam.

Physical attributes affecting movement or function

1. Total UE Fugl-Meyer score <19 or >58, or = 0 for finger mass extension/grasp release hand score
2. UE pain that substantially interferes with ADL's.
3. Maximum assistance required for mobility.
4. Passive ROM limitation of the hemiparetic upper extremity that prevents functional use of limb/hand, including any of the following:
    1. Shoulder: flexion <90°, abduction <90°, external rotation <45°
    2. Elbow/Forearm: extension <-20°, supination or pronation < 45° from neutral
    3. Wrist/Finger: flexion or extension <0°, MCP or IP extension <30°

Pre-morbid status

1. Head trauma requiring > 48 hours of hospitalization within past 12 mos.
2. Psychiatric illness requiring hospitalization within past 24 mos.
3. Arm or hand injury limiting use prior to stroke
4. Amputation of all fingers or thumb of affected hand
5. Pre-morbid motor impairment of the contralateral upper extremity of neurologic origin
6. Barthel Index < 95

Medication, Drug and/or Alcohol

1. Active or recent drug treatment for dementia
2. Treated with Botox in affected arm within last 3 months
3. Reported or positive toxicology screen for illegal substances within the past 3 years
4. Reported alcohol use or treatment since index stroke

Cognition and Participation

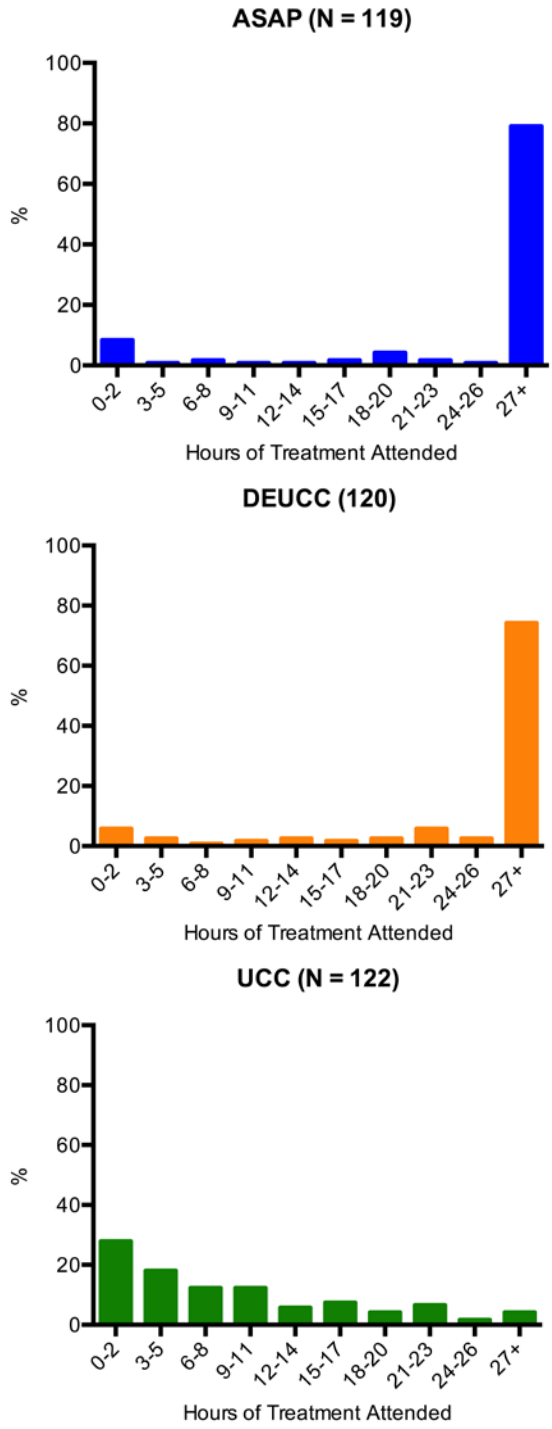
1. Enrollment in another rehabilitation study
2. Expected inability to participate in study due to illness, social, or geographic reasons
3. Unable to follow a 2-step command per NIHSS
4. < 2 on the Mini-Cog with an abnormal Clock Draw Test (CDT) or score = 0
5. PHQ-9 total score between 10 and 19 without management plan or score >19
6. Judged medically unstable and/or unable to participate by primary or site physician

Other

1. Received > 6 hours of Outpatient Occupational Therapy (OT) since stroke (Home Health and OT Evaluation do not count toward 6 hour maximum)
2. Clinician's best judgment (multiple factors in combination): The Site Physician and Clinical Site Coordinator concur that the prospective participant is NOT a candidate for randomization

eFigure. Frequency Plots of Hours of Treatment Attended by Group

Frequency plots showing % of participants in each group by hours of treatment attended. ASAP = Accelerated Skill Acquisition Program, DEUCC = Dose-equivalent usual care, UCC = Monitoring-only usual care. Participants who did not attend any treatment were included in the 0-2 hour category.



eTable 2. Therapy Content and Dose Prescribed for the Three Treatment Groups

Study Interventions	Accelerated Skill Acquisition Program (ASAP)	Dose-equivalent Usual and Customary Occupational Therapy (DEUCC)	Usual and Customary Occupational Therapy (UCC)
Therapy Content	Structured, principle-based task-oriented training including: Skill acquisition through intense bouts of task-specific practice, strengthening exercises, shoulder stability/mobility training and motivational enhancements to enable self-confidence and autonomy support to use the stroke-affected arm and hand in valued activities outside the clinic. Focus entirely on recovery of affected upper extremity	Not structured or standardized across therapists or sites Consisted of usual and customary practice according to local practices, payer guidelines, and participant preferences. May focus on more diverse needs than affected upper extremity	Not structured or standardized across therapists or sites Consisted of usual and customary practice according to local practices, payer guidelines, and participant preferences. May focus on more diverse needs than affected upper extremity
Dose Prescribed	30 hours 3x/week, 10 weeks	30 hours 3x/week, 10 weeks	Dose as prescribed & provided

Note. Intervention allocation was equal (1:1:1) across groups, and stratified by severity and time since stroke onset and site.

eTable 3. End-of-Therapy and End-of-Study Pairwise Group Comparison Effect Size (Cohen's D) and 95% CI of Difference

	***Log* Wolf Motor Function Time Test (seconds)**			**Wolf motor Function Mean Time Test (seconds)**			**Stroke Impact Scale: Hand Function**		
	ASAP	**DEUCC**	**UCC**	**ASAP**	**DEUCC**	**UCC**	**ASAP**	**DEUCC**	**UCC**
Scores M (95% CI)									
Baseline	2.22 (2.02, 2.41)	2.00 (1.83, 2.17)	2.11 (1.92, 2.30)	16.60 (13.20, 19.99)	12.93 (9.60,16.26)	15.06 (11.77, 18.36)	31.1 (26.6, 35.7)	32.8 (28.7, 36.9)	28.2 (24.2, 32.3)
End-of-therapy	1.39 (1.24, 1.54)	1.26 (1.11, 1.40)	1.41 (1.24, 1.57)	6.23 (4.68, 7.77)	5.66 (3.84, 7.48)	7.81 (5.03, 10.59)	69.1 (64.3, 73.9)	64.2 (59.7, 68.8)	61.0 (56.1, 65.9)
End-of-study	1.39 (1.21, 1.58)	1.16 (1.03, 1.30)	1.36 (1.17, 1.55)	7.79 (5.21, 10.37)	4.81 (3.27, 6.34)	7.85 (5.20, 10.51)	67.6 (62.4, 72.8)	68.1 (63.4, 72.7)	63.8 (58.8, 68.8)
Change from Baseline M (95% CI)									
End-of-therapy	-0.82 (-0.97, -0.68)	-0.75 (-0.88,-0.61)	-0.71 (-0.85,-0.56)	-10.37 (-13.06,-7.69)	-7.27 (-9.61, -4.94)	-7.25 (-9.84, -4.66)	37.9 (33.3, 42.6)	31.4 (26.8, 36.1)	32.8 (28.3, 37.2)
End-of-study	-0.82 (-1.00,-0.64)	-0.84 (-0.99,-0.69)	-0.75 (-0.92.-0.59)	-8.81 (-12.15, -5.47)	-8.12 (-10.66, -5.59)	-7.21 (-9.79, -4.63)	36.5 (30.9, 42.1)	35.3 (30.2, 40.3)	35.5 (30.9, 40.2)
	ASAP vs DEUCC	**ASAP vs UCC**	**DEUCC vs UCC**	**ASAP vs DEUCC**	**ASAP vs UCC**	**DEUCC vs UCC**	**ASAP vs DEUCC**	**ASAP vs UCC**	**DEUCC vs UCC**
Mean difference in change M (95% CI)									
End-of-therapy	0.04 (-0.11, 0.19)	-0.06 (-0.22, 0.11)	-0.09 (-0.25, 0.08)	-0.63 (-2.40, 1.13)	-2.10 (-4.65, 0.46)	-1.13 (-3.64, 1.38)	5.4 (-0.1, 11.0)	6.4 (0.5, 12.2)	0.8 (-4.8, 6.5)
p	0.56	0.51	0.29	0.48	0.11	0.38	0.06	0.03	0.77
End-of-study	0.14 (-0.05, 0.33)	-0.01 (-0.22, 0.21)	-0.14 (-0.32, 0.05)	1.81 (-0.83, 4.45)	-0.59 (-3.77. 2.60)	-2.12 (-4.52, 0.27)	0.6 (-6.4, 6.5)	2.6 (-3.8, 9.0)	2.1 (-4.0, 8.3)
p	0.16	0.94	0.15	0.18	0.72	0.08	0.99	0.42	0.49
Δ									
End-of-therapy	0.06 (-0.18, 0.32)	-0.07 (-0.34, 0.17)	-0.11 (-0.39, 0.12)	-0.07 (-0.34, 0.16)	-0.17 (-0.046, 0.05)	-0.09 (-0.37, 0.14)	0.2 (-0.01, 0.50)	0.23 (0.02, 0.53)	0.03 (-0.21, 0.29)
End-of-study	0.15 (-0.30, 0.21)	-0.01 (-0.26, 0.24)	-0.10 (-0.15, 0.36)	0.14 (-0.08, 0.42)	-0.04 (-0.72, 0.44)	-0.18 (-0.11, 0.11)	1.96^{E-03} (-0.48, 0.03)	0.08 (-0.44, 0.07)	0.07 (-0.16, 0.34)

Data reflect imputed values; ASAP (N = 119) DEUCC (N = 120), UCC (N = 122). Δ reflects Cohen's Δ effect size for mean difference. Mean group difference in change from either baseline-to-end of therapy or end-of study, adjusted for covariates are calculated for the pairs as follows: A - D, A - U, D - U. Unless otherwise specified, values are Mean (95% CI). End-of-therapy occurred 16 weeks post-randomization; end of study was the primary endpoint and occurred 12 months post-randomization. ASAP = Accelerated Skill Acquisition Program, DEUCC = Dose-equivalent Usual Therapy, and UCC = Monitoring-only Usual Therapy.