

Abstract

Motor Control Models and Neurologic Rehabilitation Approaches: A Literature Review

Kim Jong-man, Ph.D., P.T., O.T.

Dept. of Physical Therapy, Seonam University

Cynn Heon-seock, M.A., R.P.T.

Dept. of Physical Therapy, Seoul Health College

Physical therapists should understand motor control models and apply various models to evaluation and treatment of neurologically impaired patients. Thus, this paper reviews motor control models and applications in clinical settings. Assumptions and limitations of reflex models, hierarchical models, and systems models are presented. This paper also delineates goals and dissatisfaction of neurologic rehabilitation approaches for neurologically impaired patients. Muscle reeducation approach, neurotherapeutic facilitation approach, and contemporary task-oriented approach are explained.

Key Words: Motor control model; Neurologic rehabilitation approach.

. 1990

“The II STEP Conference”

가

가

(Montgomery Connolly, 1991).

가

가

(neurotherapeutic facilitation approach)

가

가

(Reflex Model)

(Lister, 1991). motor output) (stereotypical Sherrington (1906) Sherrington

가 (Abernethy Sparrow, 1992; Horack, 1991; Mathiowertz Haugen, 1994).

가 (reflex)

가? 가? (voluntary movement)

가? (unilateral neglect) 가? (sensory feedback)

가 가 (error)

가 가 Adams(1987) (closed-loop control)

가 (executive system) (effector) 가

가 (Lettinga, 1999; Shumway-Cook Woollacott, 1995).

가 (reflex test)

Rood(1954)

(brushing),

(stretch), (pressure)
 (tapping) 가 .
 (facilitation) , (peripheralist)
 (inhibition) Eldred Hagbarth(1954) ,
 (vibration) (muscle activation)
 (tonic labyrinthine reflex) pattern)
 가 (motor program)
 (centralist) (Horack, 1991).
 (Mathiowertz
 Haugen, 1994). 가
 (de- (Keele, 1968). ,
 afferented animal) , , , ,
 (reaching task)
 (Lashley, 1917; Polit
 Bizzi, 1979; Taub, 1976).
 Schmidt(1975)
 가 , , (compa-
 (open-loop control) rator) 가
 (Schmidt, 1975). 가
 (anticipatory
 control)
 (feedforward control)
 (anticipatory control)
 (Schmidt, 1988).

(Hierarchical Model)

Jackson Taylor
 (1932) 가 가
 가 가
 가

가
가
가
(Mathiowertz Haugen,
1994).
(spinal cat)가
(Grillner, 1975).
Bernstein(1967) (degrees of freedom)
가
(asymmetrical tonic neck reflex)
가
(neck righting reflex)
(, 2000). , Bernstein(1967)
(degrees of freedom)가
(synergy)
가
(performance context) (coordinative structure)
가
가
(System Model)
1932 Bernstein
. Gordon(1987)

가 , 가 가
 가 ,
 (lever arm) .
 가
 (abnormal flexion pattern) . 가
 가
 (real-life performance environment)
 (Bernstein, 1967). 가 가
 가 , 'thixotropy'
 가 가
 가
 cross-bridge stiffness가 가 ,
 cross-bridge
 stiffness가 가
 가 ,
 가 (ROM exercise)
 (stretching exercise)
 Gibson(1966)
 (perception)
 (action) (ecological (Muscle Reeducation Approach)
 approach) . 1940 1950
 (functional Sister
 tasks) (person- Kenny가 (Knapp, 1955).
 environment) ,
 Gibson(1977)
 (motor
 가 (affordance) , engram) . Crossman(1959)
 3
 (optical array) , (motor program)

가

가

가

(multimuscular coordination)

가

(spasticity)

가

(cephalo to caudal),

(proximal to distal)

(ulnar to radial)

가

(muscle activation)

가

(Gordon, 1987).

가

(Landau Hunt, 1990).

(Neurotherapeutic Facilitation Approach)

(selective posterior

rhizotomy)

Rood(1954)

(sensorimotor approach), Knott
Voss(1968) (pro-
prioceptive neuromuscular facilitation; PNF),
Brunnstrom(1970) (movement
therapy), Ayres (sensory
integration therapy), Bobath(1978)

(Giuliani, 1991).

Bobath

(cocontraction)

NDT)가

(neurodevelopmental treatment;

(Bobath, 1990). Bobath

(neurophysiological approach)

가 ,
(Miller Light, 1997) (Kamm ,
(Sharp Brouwer, 1997) , 1990). ,
가 가
가 . (Higgins, 1991).
가
Carey Burghardt(1993)
가 (facilitator) (inhibitor)
(Carr Shepherd, 1987;
cross-bridge stiffness, Davies, 1985).
가
가
(Horack, 1991). ,
가
가
(functional strengthening exercise)
(Gordon, (, 1997).
1987; Horack, 1991). 가
가
가
(Contemporary Task-Oriented Approach) 가
(Horack, 1991) 가
가 ,
가 가 (natural
environment) 가 .
가 가
가

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