뇌성마비 아동에 대한 대운동 기능검사의 신뢰도 분석

연세의료원 재활병원 물리치료실·삼육대학교 의약학부 재활치료학과*

임선규 · 이해덕*

The Reliability Analysis of the Gross Motor Function Measure in Children with Cerebral Palsy

Lim, Sun Kyu, R. P. T., Lee, Hae Deok, M. D., MA., R. P. T.*

Dept. of Physical Therapy, Yonsei Rehabilitation Hospital, Yonsei University Medical Center.
*Dept. of Rehabilitation Therapy, College of Medical Pharmacy, Sham Yook University.**

— ABSTRACT —

The purpose of this studied was to examine the reliability analysis of the GMFM in children with C. P.

The subject of this study were 40 C. P patient who had been hospitalized Department of Sam-Yook Rehabilitation Hospital.

Subjects were 28 boys and girls, aged 6 to 8 years.

Reliability of each dimension of the GMFM were analyzed using Cronbach coefficients and to examine the intra-rater reliability were using Pearson correlation coefficients.

The result of reliability analysis of the GMFM revealed higher reliability values.

The reliability of the total dimension score was 95.

Test-retest revealed intra-rater correlation coefficients from .71 to .98.

The study presents that GMFM is useful in assessment of function of children with C. P by the quantitative description of the function

서 론

뇌성마비 아동의 운동기능을 향상시키는 일은 재활분야에서는 매우 주요 관심사이며 이에 대한 보고는 많이 되고 있으나 이런 관심사나 보고에 비하여 객관적이고 구체적인 평가도구는 매우 적고 또한 개발된 도구 역시 운동 성취도에 대한 것은 측정치 못하였다.[18]

즉 Deaver와 Brown이 1945년 일상생활의 독립성을 포함한 평가기준을 발표한 이래 약 35년간 Barthel Index, ESCROW(Environmental barriers, social interactions, cluster of family support, resources for finacial support, outlook, work—related activities) profille, PULSES profile, Functional Independence Measure(FIM), 그리고 Edinburgh Rehabilitation Status(ERSS)[22] 등의 기능 평가도구들이 개발되어 사용되어왔으며 뇌성마비 환아의 기능평가는 Peabody(1974)[12], Bayley(1969)[4] 등이 개발한 발달검사를 이용하거나 Harry—Anne Matty 등이 개발한 ABC (assessment of behaviral components 1988)[16] 검사법을 사용하나 이들을 이용한 평가법으로는 통계적으로 의미있는 기능의 향상 정도를 파악하기는 어렵다.

이러한 기능평가 척도들은 나름대로 장점이 있으나 각각 한계를 지니기 때문에 광범위한 장애를 포함하면서도 쉽게 측정이 가능하고 장애의 변화 추적에 민감하며, 검사자들 간의 신뢰도가 높으며 검사의 결과가 의미하는 것을 쉽게 인식할수 있는 기능평가 척도를 마련하는 일이 계속 연구 중에 있다. 그러나 기능평가 척도를 마련하기 위해서는 무엇보다도 먼저 뇌성마비아의 기능을 평가하는데 어느 척도가 가장 적합한지에 대하여 연구되어야 한다.

이에 본 연구에서는 캐나다 토론토에서 1990년 Russel 등이 개발한 대운동 기능검사(Gross Motor Function Measurement : GMFM)[26]의 신뢰도 검사를 실시하여 향후 뇌성마비 아동의 호전 정도에 대한 평가자료로 이용하고자 할려고 함이며 이러한 신뢰도 검사는 사용여부를 판단하는데 중요한 근거가 된다.

연구 대상 및 방법

연구대상

본 연구는 삼육재활병원에 입원하여 치료받고 있는 뇌성마비 환아 40명을 대상으로 하였다. 이들은 경련형이 20명, 무정위형이 20명으로 경도와 중등도의 운동장애를 나타내며, 성별 분포는 남자 28명(70%), 여자 12명(30%)이었다. 이들의 연령 분포는 6세에서 13세로 평균연령은 9.75 ± 1.59세, 무정위형 9.85 ± 2.35세 이었다(표 1).

표 1. 40명 뇌성마비 환아의 유형에 따른 연령 및 성별 분포

유형 연령(세)/성	경 련 형 남	여	무 정 위 형 남	여	총 계
6~7	0	1	3	0	4
8~9	5	2	2	5	14
10~11	8	2	3	1	14
12~13	1	1	5	1	8
계	14	6	13	7	40

연구방법

의사와 물리치료사로 구성된 4인의 검사자들이 대운동 기능검사(GMFM)를 이용하여 대운동 기능정도를 측정하여 검사자간 신뢰도(inter—rater reliabliity)와 검사자 내의 신뢰도(intra—rater reliability)를 구하였다.

대운동 기능검사

대상환아 40명에 대하여 대운동 기능검사 장면을 비디오 촬영을 하였다. 환아 1인을 검사하는데 30~40분 소요되었으며 기능을 최대로 나타낼 수 있도록 환경을 조성하였다.

촬영 후 4인의 검사자들이 비디오 화면을 보면서 1차로 각 항목에 대한 평가를 하였다. 2

주일 후 1명의 검사자가 같은 비디오 화면을 보면서 40명에 대한 2차 평가를 하였다.

이 연구에서 사용된 평가도구인 대운동 기능검사(Gross Motor Function Measure)는 다음의 5가지 항목의 88문항으로 구성되어 있다 (부록 I).

① 눕기와 뒤집기(lying & rolling)
② 앉기(sitting)
③ 네발기기와 무릎서기(crawling & kneeling)
④ 서기(standing)
⑤ 걷기, 달리기, 뛰기(walking, running, jumping)

또 각 항목별 점수기준은 아래와 같다.

0점 : 시도도 하지 않음
1점 : 시도는 함(그 항목을 약 10% 미만으로 수행할 경우)
2점 : 부분적으로 수행함(그 항목을 약 10% ~90% 미만으로 수행할 경우)
3점 : 완전히 수행함

각 항목별로 같은 비중을 두기 위하여 각 항목의 점수는 백분율로 환산하였으며(환아의 점수/최고점수 × 100) 총합은 5개 항목의 퍼센트 환산점수의 합을 5로 나누어 구하였다.

통계처리

대운동 기능검사의 경련형과 무정위형에 따른 차이는 t–test를 하였다. 대운동 기능검사의 신뢰도를 측정하기 위하여 경련형과 무정위형의 점수에서 Cronbach 계수(α)를 구하였으며 검사자간 신뢰도를 측정하기 위하여 4인의 검사자들의 점수들을 2인씩 짝을 지어 각각에 대한 Pearson 상관계수(r)를 유형별로 구하였다. 검사자 내의 신뢰도를 측정하기 위하여 같은 검사자의 1차검사 점수와 2차검사 점수의 상관계수를 구하였다.

연구결과

대운동 기능검사에 대한 기술 통계치

4인의 검사자가 측정한 40명의 뇌성마비아동의 대운동 기능검사의 평균점수는 항목별로 눕기와 뒤집기에서 95.58 ± 4.37점, 앉기에서 96.80 ± 3.94점, 네발기기와 무릎서기에서 88.43 ± 10.21점, 서기에서 57.25 ± 23.65점, 걷기, 달리기, 뛰기에서 38.90 ± 19.48점이었으며, 총합은 75.25 ± 10.16점이었다(표 2). 눕기와 뒤집기 그리고 앉기의 두 개 항목에서는 경련형과 무정위형의 점수의 차는 없었으나($P<0.05$) 나머지 항목에서는 무정위형의 평균 점수가 높았다.

대운동 기능검사에 대한 신뢰도 분석

검사자간 신뢰도 분석 대운동 기능검사에 대한 신뢰도 분석결과 이들 점수의 Cronbach 계수(α)는 경련형에서 0.73이고 무정위형에서 0.74

표 2. 40명의 뇌성마비 아동의 유형에 따른 대운동 기능검사의 항목별 평균점수

항목별 대운동 기능검사 점수	경 련 형	무 정 위 형	전 체	t(1.39)
눕 기 와 뒤 집 기	96.85 ± 3.03	94.30 ± 5.15	95.58 ± 4.37	1.908
앉 기	96.05 ± 4.87	07.55 ± 2.65	96.80 ± 3.94	−1.209
네발기기와 무릎서기	84.90 ± 11.71	91.95 ± 7.10	88.43 ± 10.21	−2.300 *
서 기	48.20 ± 26.32	66.30 ± 16.81	57.25 ± 23.65	−2.519 *
걷기, 달리기, 뛰기	32.55 ± 18.89	45.25 ± 18.36	38.90 ± 19.48	−2.156 *
총 합	71.05 ± 11.43	79.45 ± 8.87	75.25 ± 10.96	−2.590 *

* : $P<0.05$

의 높은 신뢰도를 나타냈다.

경련형 아동에 대한 각 항목에서의 검사자들 간의 평균 상관계수(r)는 눕기와 뒤집기에서 0.82, 앉기에서 0.88, 네발기기와 무릎서기에서 0.90, 서기에서 0.87, 걷기, 달리기, 뛰기에서 0.98, 그리고 총합에서 0.99로 유의하게(P< 0.0001) 높은 상관관계를 나타냈다(표 3).

표 3. 경련형 아동 20명에 대한 4명의 검사자들간의 대운동 기능검사 점수의 상관계수

항 목	검사자 I − II	검사자 I − III	검사자 I − IV	검사자 II − III	검사자 II − IV	검사자 III − IV	평균상관계수
눕 기 와 뒤 집 기	0.91	0.77	0.81	0.86	0.79	0.89	0.82
앉 기	0.82	0.95	0.96	0.80	0.82	0.93	0.88
네발기기와 무릎서기	0.88	0.91	0.81	0.97	0.78	0.79	0.90
서 기	0.75	0.75	0.75	0.99	0.99	0.99	0.87
걷기, 달리기, 뛰기	0.99	0.98	0.97	0.99	0.98	0.97	0.98
총 합	0.99	0.99	0.98	0.99	0.98	0.99	0.99

P < 0.0001

무정위형 아동에 대한 각 항목에서의 검사자 들간의 평균 상관계수(r)는 눕기와 뒤집기에서 0.83, 앉기에서 0.85, 네발기기와 무릎서기에서 0.94, 서기에서 0.97, 걷기, 달리기, 뛰기에서 0.97, 그리고 총합에서 0.97로 모두 유의하게(P <0.0001) 높은 상관관계를 나타내었다(표 4).

표 4. 무정위형 아동 20명에 대한 4명의 검사자들간의 대운동 기능검사 점수의 상관관계

항 목	검사자 I − II	검사자 I − III	검사자 I − IV	검사자 II − III	검사자 II − IV	검사자 III − IV	평균상관계수
눕 기 와 뒤 집 기	0.92	0.88	0.77	0.95	0.75	0.73	0.83
앉 기	0.89	0.90	0.75	0.96	0.77	0.83	0.85
네발기기와 무릎서기	0.82	0.82	0.80	0.99	0.87	0.87	0.86
서 기	0.90	0.92	0.95	0.98	0.95	0.93	0.94
걷기, 달리기, 뛰기	0.96	0.98	0.97	0.98	0.96	0.98	0.97
총 합	0.97	0.96	0.95	0.98	0.97	0.97	0.97

P < 0.0001

검사자 내 신뢰도 분석

검사자 내의 신뢰도(test−retest reliability) 를 조사하기 위하여 시행한 1인의 검사자에 의 한 반복검사에서 각 항목별 평균 상관계수(r) 는 경련형의 경우 눕기와 뒤집기에서 0.81, 앉 기에서 0.90, 네발기기와 무릎서기에서 0.86, 서기에서 0.97, 걷기, 달리기, 뛰기에서 0.71, 총합에서 0.99이며, 무정위형의 경우 눕기와 뒤집기에서 0.73, 앉기에서 0.86, 네발기기와

표 5. 검사자 1인의 반복 검사점수와의 상관관계

항 목	경 련 형	무 정 위 형
눕 기 와 뒤 집 기	0.81	0.73
앉 기	0.90	0.86
네발기기와 무릎서기	0.86	0.90
서 기	0.97	0.83
걷기, 달리기, 뛰기	0.71	0.98
총 합	0.99	0.90

무릎서기에서 0.90, 서기에서 0.83, 걷기, 달리기, 뛰기에서 0.98, 총합에서 0.95로 나타났다. 이로 상관계수는 모두 유의 하게(P<0.001) 높은 상관관계를 나타냈다(표 5).

고　찰

뇌성마비 아동의 운동기능을 측정하는 것은 아주 복잡한 문제이다. 어떤 뇌성마비 아동은 운동기능은 발달되었으나 전체적인 발달은 지체를 보이기도 하며 단기간이거나 아니면 장기간에 걸쳐 발달의 진전을 보이지 않기도 하고 움직임이 비정상적유형을 띄게 되며 퇴행하는 경우도 발생한다. 이러한 뇌성마비의 운동특성은 효과적인 치료가 어떤것인지 결정하기 어렵게 하며 여러 치료법이 있으나 명확하게 어떤 치료만이 가장 좋다고 할 수는 없다. 이러한 상황에서 정확 한 운동평가가 된다면 앞의 문제들을 해결하는데 도움이 될 것이다.

우리가 어떤 평가도구를 가지고 환자를 평가할 때는 그측정 방법이 관련이 있는 환자집단에 얼마나 적용이 가능한지 제시 하여야 하며 측정자 간 신뢰도와 측정자 내 신뢰도를 제시하여 독자들이 연구의 결과를 판단할 수 있게 도와주어야 한다. 연구자들이 자신들이 사용한 측정도구 또는 측정법에 대한 신뢰도를 모른다면, 연구에 사용된 변수들간의 관계를 기술하면서 많은 실수를 하게된다. 따라서 연구자들은 측정도구 혹은 측정방법에 대한 타당도뿐만 아니라 신뢰도에 대하여 항상 관심을 두어야 한다[24].

신뢰도(reliability)라 함은 얼마나 정확하게 얼마나 오차없이 측정하고 있느냐의 개념이며, 측정하고 있는 정도의 일관성(consistency)이 있느냐의 문제에 관계 한다. 이러한 신뢰도는 Pearson의 적률상관계수(Pearson product-moment correlation coefficient) 방법을 말하며, 일반적으로 r = +.70 이상 나와야 신뢰도가 높다고 할 수 있다.

타당도(validity)는 한 검사 또는 평가도구가 측정하려고 하는 것을 어느정도로 측정하고 있느냐의 정도를 의미하며, 얼마나 충실하에 목적하는 바를 재느냐의 개념이다.

뇌성마비 아동을 임상적으로 운동기능의 정도를 평가하려면 구체적이며 구조적인 특성(structural characteristics)을 갖고 있는 평가방법을 적용하여야 한다. 즉 평가항목들은 임상적으로 관련성이 있는 항목으로만 구성되어야 하며, 아동에 대한 변화가 있을 때 변화를 감지해낼 수 있는 반응성(responsiveness)도 갖추어야 한다[9,13]. 또한 사용방법이 용이하고 신뢰도가 높아 측정자가 바뀌거나 반복검사를 했을 때 안정된 점수가 나오고 점수의 변화가 진정한 의미의 변화를 나타내는 타당도가 높은 검사여야 한다.

본 연구에 사용된 대운동 기능 검사는 이러한 것들을 모두 고려하여 Motor Control Assessment[9]와 Hoskins and Squires[18]의 문항을 참고로 하여 Russel 등 저자들이 임상경험을 바탕으로 선택한 88문항으로 구성되었으며(1989) 시간에 따른 대운동 기능의 변화를 표준화하기 위하여 고안되었다.

이 검사는 뇌성마비의 현재의 운동기능상태를 나타내어 주며 치료목표를 설정 하는데 유용하고, 부모들에게 환아의 진전도를 쉽게 설명할 수 있게 하므로 임상에서나 연구용으로 적합하다.

이 검사는 기능을 어느 정도 많이 할 수 있는가와 기능을 어느 정도 잘 수행하느냐를 평가할 수 있으나 움직임의 질을 평가하는 검사법은 아니다. 88문항이 5 항목으로 나뉜 구성을 하고 있으며 각 문항은 5세 정상 아동이라면 모두 수행할 수 있다. 각 문항에 0~3점을 주게 되는데 각각의 점수 기준은 <부록 Ⅱ>에 수록 하였다.

Russel 등에 의하면[25,26] 대운동 발달검사의 검사자 내 점수의 상관도가 0.92인 서기를 제외한 모든 항목에서 0.99의 높은 신뢰도를 나타냈으며 검사자간의 상관도에서도 눕기와 뒤집기에서 0.87, 앉기에서 0.92, 네발기기와 무

룐서기에서 0.98, 서기, 걷기, 달리기, 뛰기 그리고 총합에서 0.99의 높은 신뢰도를 보였다고 하였다.

본 연구에서 검사자들간의 상관계수는 0.75~0.99, 검사자내의 상관계수는 0.71~0.99로 Russel 등의 결과와 차이가 난다. 이 이유는 우선 상관도 분석법의 차이에서 비롯되는 것으로 보인다. 또한 연구대상자의 뇌성마비아로써 개개인의 상태가 다르고 문화권 혹은 환경의 차이 검사자들의 수에 기인한 것으로 보인다. 그 외에 검사자들의 검사법에 대한 숙달이 부족하였던 점과 비디오 화면만으로 평가하기에는 어려운 항목들이 있었기 때문으로 생각된다. 본 연구에서는 각 영역별 점수에 대한 검사자간의 신뢰도와 전체점수에 대한 검사자간 신뢰도가 모두 .80 이상이었으므로 신뢰도는 훌륭하다고 할 수 있다. 대운동 기능검사는 일정기간 치료 후의 아동들의 운동기능의 변화를 관찰하는 데에도 역시 유용한 검사이다.

각 항목이 일정기능을 수행하도록 구성되어 있으며 치료 목표도 설정하여 아동 개개인에게 적용할 수 있다. Russel 등은 변화측정에 대한 검사자들의 신뢰도가 0.85 이상으로 높은 신뢰도를 나타낸다고 하였다[25, 26]. 본 연구에서는 변화 측정에 대한 신뢰도 조사는 하지 않았으나 결과를 비교해 볼 때 이 역시 높은 신뢰도를 나타낼 것으로 추정되며 추후 이에 대한 연구와 도구의 타당도 검증과정에 대한 연구가 더 필요할 것으로 생각된다.

결 론

저자는 뇌성마비 아동의 운동발달의 평가 및 뇌성마비 치료효과 관정에 유용한 대운동 기능검사의 신뢰도 검사를 6세에서 13세의(경련형 20명, 무정위형 20명) 40명의 뇌성마비 아동에게 실시하여 다음과 같은 결론을 얻었다.

1) 대운동 기능검사의 4인의 검사자 간의 평균 상관계수는 경련형과 무정위형에서 모두 0.82 이상으로 높은 신뢰도를 나타냈다(D<0.001).

2) 대운동 기능검사의 검사자 내의 상관계수는 경련형과 무정위형에서 모두 0.71 이상으로 높은 신뢰도를 나타냈다(D<0.0001).

이렇게 높은 신뢰도를 나타내는 대운동 기능검사를 검사자들이 충분히 검사 방법을 익힌후 적용한다면 뇌성마비 아동의 운동상태를 평가하고, 치료 목표를 세우고 치료 효과를 관정하는데 유용하게 쓰일 것으로 생각된다.

<center><부록 I></center>

Therapist's Name :   Date :

Child's Name :   Time :

  SCORING KEY 0 = does not initiate 1 = initiates 2 = partially completes 3 = complets

Item A : LYING AND ROLLING

1. SUP : HEAD IN MIDLINE : TURNS HEAD. WITH EXTREMITIES SYMMETRICAL
2. SUP : BRINGS HAND TO MIDLINE. FINGERS ONE WITH THE OTHER
3. SUP : LIFTS HEAD 45 DEGREES
4. SUP : FLEXES R HIP & KNEE THROUGH FULL RANGE
5. SUP : FLEXES L HIP AND KNEE THROUGH FULL RANGE
6. SUP : REACHES R ARM ACROSS MIDDLINE TO TOUCG TOY
7. SUP : REACHES L ARM ACROSS MIDDLINE TO TOUCG TOY
8. SUP : ROLLS TO PR OVER R SIDE
9. SUP : ROLLS TO PR OVER L SIDE
10. PR. ARMS AT SIDES : LIFTS HEAD TO VERTICAL
11. PR. ON FOREARMS : LIFTS HEAD 90°. LEBOWS EXT. CHEST RAISED
12. PR. ON FOREARMS : WEIGHT ON R FOREARM. FULLY EXTENDS OPPOSITE ARM FORWARD
13. PR. ON FOREARMS : WEIGHT ON L FOREARM. FULLY EXTENDS OPPOSITE ARM FORWARD
14. PR : ROLLS TO SUP OVER R SIDE
15. PR : ROLLS TO SUP OVER L SIDE
16. PR : PIVOTS TO R 90° USING EXTREMITIES
17. PR : PIVOTS TO L 90° USING EXTREMITIES

* TOTAL DIMENSION A [   ]

Item B : SITTING

18. SUP : HANDS GRASPED BY EXAMINER : PULLS SELF TO SITTING WITH HEAD CONTROL
19. SUP : ROLLS TO R SIDE. ATTAINS SITTING
20. SUP : RPLLS TO L SIDE. ATTAINS SITTING
21. SIT ON MAT. SUPPORTED AT THORAX BY THERAPIST : LIFTS HEAD UPRIGHT. MAINTAINS 3 SECONDS
22. SIT ON MAT.SUPPORTED AT THORAX BY THERAPIST : LIFTS HEAD MIDLINE. MAINTAINS 10 SECONDS

<center>— 271 —</center>

23. SIT ON MAT WITH FEET IN FRONT : MAINTAINS. ARMS PROPPING 5 SECONDS
24. SIT ON MAT WITH FEET IN FRONT : MAINTAINS. ARMS FREE 3 SECONDS
25. SIT ON MAT WITH FEET AND SMALL TOY IN FRONT : LEANS FORWARD. TOUCHES TOY. RE-ERECTS WITHOUT ARM PROPPING
26. SIT ON MAT WITH FEET IN FRONT : TOUCHS TOY PLACED45°BEHIND CHILD,S R SIDE.RETURNS TO START
27. SIT ON MAT WITH FEET IN FRONT : TOUCHS TOY PLACED45°BEHIND CHILD, S L SIDE. RETURNS TO START
28. R SIDE SIT : MAINTAINS.ARMS FREE. 5 SECONDS
29. L SIDE SIT : MAINTAINS.ARMS FREE. 5 SECONDS
30. L SIDE SIT : ATTAINS PR BY EXTENDING ARMS AND LOWERING WITH CONTROL
31. SIT ON MAT WITH FEET IN FRONT : ATTAINS 4 POINT OVER R SIDE
32. SIT ON MAT WITH FEET IN FRONT : ATTAINS 4 POINT OVER L SIDE
33. SIT ON MAT : PIVOTS 90° WITHOUT ARMS ASSISTING
34. SIT ON LARGE BENCH : MAINTAINS. ARMS AND FEET FREE. 10 SECONDS
35. STD FACING BENCH ATTIAINS SIT ON SAME BENCH
36. ON THE FLOOR : ATTAINS SIT ON SMALL BENCH
37. ON THE FLOOR : ATTAINS SIT ON LARGE BENCH. FEET FREE

＊TOTAL DIMENSION B ☐

Item C : CRAWLING AND KNEELING

38. PR : CREEPS FORWARD 6 FEET
39. 4 POINT : MAINTAINS. WEIGHT ON HANDS AND KNEES.10 SECONDS
40. 4 POINT : ATTAINS SIT THEN MAINTAINS. ARMS FREE
41. PR : ATTAINS 4 POINT. WEIGHT ON HANDS AND KNEES
42. 4 POINT : REACHES FORWARD WITH R ARM. HAND ABOVE SHOULDER LEVEL
43. 4 POINT : REACHES FORWARD WITH L ARM. HAND ABOVE SHOULDER LEVEL

44. 4 POINT : CRAWLS OR HITCHES FORWARD 6 FT
45. 4 POINT : CRAWLS RECIPROCALLY FORWARD 6 FT
46. 4 POINT : CRAWLS UP 4 STEPS ON HANDS AND KNEES/ FEET
47. 4 POINT : CRAWLS BACKWARDS DOWN 4 STEPS ON HANDS AND KNEE/FEET
48. SIT ON FLOOR : ATTAINS HIGH KN. ARMS FREE. MAINTAINS 10 SECONDS
49. HIGH KN : ATTAINS HALF KN ON R KNEE. ARMS FREE. MAINTAINS 10 SECONDS
50. HIGH KN : ATTAINS HALF KN ON L KNDD. ARMS FREE. MAINTAINS 10 SECONDS
51. HIGH KN : KN WALKS FORWARD 10 STEPS. ARMS FREE

*TOTAL DIMENSION C [_____]

Item D : STANDING

52. FROM FLOOR : PULLS TO STD AT LARGE BENCH
53. STD : MAINTAINS. 3 SECONDS. ARMS FREE
54. STD : HOLDING ON TO LARGE BENCH WITH ONE HAND. LIFTS R
55. STD : HLLDING ON TO LATGE BENCH WITH ONE HAND. LIFTS L
56. STD : MAINTAINS. 20 SECONDS. ARMS FREE
57. STD ON R LEG : MAINTAINS. 10 SECONDS. ARMS FREE
58. STD ON L LEG : MAINTAINS. 10 SECONDS. ATMS FREE
59. SIT ON SMALL BENCH : ATTATINS STD WITHOUT USING ARMS
60. HIGH KN : ATTAINS STD THROUGH HAL KN ON R KNEE. WITHOUT
61. HIGH KN : ATTAINS STD THROUGH HAL KN ON L KNEE. WITHOUT
62. STD : LOWERS TO SIT ON FLOOR WITH CONTROL ARMS FREE
63. STD : ATTAINS SOUAT. WITHOUT USING ARMS
64. STD : PICKS UP OBJECT FROM FLOOR. ARMS FREE RETURNS TO

*TOTAL DIMENSION D [_____]

Item E : WALKING, RUNNING, JUMPING

65. STD. 2HANDS ON LARGE BENCH : CRUISES 5 STEPS TO R
66. STD. 2HANDS ON LARGE BENCH : CRUISES 5 STEPS TO L
67. STD : WALKS FORWARD 10 STEPS. 2 HANDS HELD
68. STD : WALKS FORWARD 10 STEPS. 1 HANDS HELD
69. STD : WALKS FORWARD 10 STEPS. ARMS FREE
70. STD : WALKS FORWARD 10 STEPS. STOPS. TURNS 180°
    RETURN
71. STD : WALKS BAGKWARD 10 STEPS. ARMS FREE
72. STD : WALKS FORWARD 10 STEPS. CARRYING A LARGE
    OBJECT
73. STD : WALKS FORWARD 10 CONSECUTIVE STEPS BETWEEN
    PARAL
74. STD : WALKS FORWARD 10 CONSECUTIVE STEPS ON A
    STRAIGHT
75. STD : STEPS OVER STICK AT KNEE LEVEL. R FOOT LEADING
76. STD : STEPS OVER STICK AT KNEE LEVEL. L FOOT LEADING
77. STD : RUNS 15 FEET. STOPS & RETURNS
78. STD : KICKS BALL WITH R FOOT
79. STD : KICKS BALL WITH L FOOT
80. STD : JUMPS 12 INCHES HIGH. BOTH FEET SIMUL
    TANEOUSLY
81. STD : JUMPS FORWARD 12 INCHES. BOTH FEET SIMUL
    TANEOUS
82. STD : WITH ARMS FREE : HOPS WITHIN A 24″ CIRCLE ON R
    FOOT
83. STD : WITH ARMS FREE : HOPS WITHIN A 24″ CIRCLE ON L
    FOOT
84. STD : WALKS UP 4 STEPS. HOLDING 1 RAIL. ALTERNATING
    FEET
85. STD : WALKS DOWN 4 STEPS. HOLDING 1 RAIL.
    ALTERNATING FEET
86. STD : WALKS UP 4 STEPS. ARMS FREE. ALTERNATING
    FEET
87. STD : WALKS DOWN 4 STEPS. ARMS FREE. ALTERNATING
    FEET
88. STD ON 6″STEP : JUMPS OFF, ARMS FREE, WITHOUT
    FALLING

＊TOTAL DIMENSION E [＿＿＿＿]

A. Lying & Rolling $\qquad \dfrac{\text{Total Dimension A}}{51} = \dfrac{}{51} \times 100 = \underline{\quad} \%$ A. $\square$

B. Sitting $\qquad \dfrac{\text{Total Dimension B}}{60} = \dfrac{}{51} \times 100 = \underline{\quad} \%$ B. $\square$

C. Crawling & Kneeling $\qquad \dfrac{\text{Total Dimension C}}{42} = \dfrac{}{42} \times 100 = \underline{\quad} \%$ C. $\square$

D. Standing $\qquad \dfrac{\text{Total Dimension D}}{39} = \dfrac{}{39} \times 100 = \underline{\quad} \%$ D. $\square$

E. Walking, Running & Jumping $\quad \dfrac{\text{Total Dimension A}}{51} = \dfrac{}{51} \times 100 = \underline{\quad} \%$ E. $\square$

$$\text{TOTAL} = \frac{\%A \;+\; \%B \;+\; \%C \;+\; \%D \;+\; \%E}{\text{Total } \# \text{ of Dimensions}}$$

$$= \frac{\underline{\quad} + \underline{\quad} + \underline{\quad} + \underline{\quad}}{5} = \frac{}{5} = \underline{\quad} \%$$

$$\text{GOAL TOTAL} = \frac{\text{Sum of } \% \text{ scores for each dimension as a goal area}}{\# \text{ Goal areas}}$$

$$= \underline{\qquad\qquad} = \underline{\quad} \%$$

<부 록 II>

GUIDELINES FOR ITEM SCORING

1. Supine : head in midline : turns head, with extremities symmetrical
   0. does not maintain head in midline
   1. maintains head in midline 1 to 3 seconds
   2. maintains head in midline, turns head with extremities asymmetrical
   3. turns head with extremities symmetrical
2. Supine : brings heads to midline, fingers one with one with the other
   0. does not initiate bilateral hands to midline
   1. initiates bilateral hands to midline
   2. brings hands to front of body, does not finger one with the other
   3. brings hands to midline, fingers one with the other
3. Supine : lifts head 45 degrees
   0. does not initiate neck flexion
   1. initiates neck flexion but does not lift head
   2. lifts head < 45 degrees
   3. lifts head 45 degrees
4. Supine : flexes right hip and knee through full range
   0. does not initiate right hip and knee flexion
   1. initiates right hip and knee flexion
   2. flexes right hip and knee through partial range
   3. flexes fight hip and knee through full range
   Note : May move both legs together in ♯4 & 5
5. Supine : flexes left hip and knee through full range
   0. does not initiate left hip and knee flexion
   1. initiates left hip and knee flexion
   2. flexes left hip and knee through partial range
   3. flexes left hip and knee through full range
6. Supine : reaches right arm across midline to touch toy
   0. does not initiate reaching toward midline
   1. initiates reaching toward midline
   2. reaches out with right arm, does not cross midline
   3. reaches right arm across midline to touch toy
   Note : Therapist must not hold opposite arm down. May use a large toy to incorporate 2 hands.
7. Supine : reaches left arm across midline to touch toy
   0. does not initiate reaching toward midline
   1. initiates reaching toward midline

2. reaches out with left arm, does not cross midline

3. reaches left arm across midline to touch toy

8. Supine : rolls to prone over right side

   0. does not initiate rolling

   1. initiates rolling

   2. rolls part way to prone

   3. rolls to prone over right side

9. Supine : rolls to prone over left side

   0. does not initiate rolling

   1. initiates rolling

   2. rolls part way to prone

   3. rolls to prone over left side

10. prone, arm at sides : lifts head to vertical

    0. does not initiate lifting head

    1. initiates lifting head, chin does not clear mat

    2. lifts nead < 90 degrees, chin clears mat

    3. lifts head to vertical

11. Prone, on forearms : lifts head 90 degrees, elbows extended, chest raised

    0. does not initiate lifting head

    1. initiates lifting head, chin does not clear mat

    2. lifts head < 90 degrees, weight on forearms

    3. lifts head 90 degrees, elbows extended, chest raised

12. Prone, on forearms : weight on right forearm, fully extends opposite arm forward

    0. does not initiate supporting weight on right forearm

    1. weight on right forearm,opposite arm comes free,does not extend forward

    2. weight on right forearm, partially extends opposite arm forward

    3. weight on right forearm, fully extends opposite arm forward

13. Prone, on forearms : weight on left forearm, fully extends opposite arm forward

    0. does not initiate supporting weight on left forearm

    1. weight on left forearm, opposite arm comes free, does not extend forward

    2. weight on left forearm, partially extends opposite arm forward

    3. weight on left forearm, fully extends opposite arm forward

14. Prone : rolls to supine over right side

    0. does not initiate rolling

    1. initiates rolling

    2. rolls part way to supine

    3. rolls to supine over right side

15. Prone : rolls to supine over lift side

    0. does not initiate rolling

    1. initiates rolling

2. rolls part way to supine

3. rolls to supine over left side

16. Prone : pivots to right 90 degrees using extremities

    0. does not initiate pivot to right

    1. initiates pivot to right using extremities

    2. pivots to right $<$ 90 degrees using extremities

    3. pivots to right 90 degrees using extremities

17. Prone : pivots to left 90 degrees using extremities

    0. does not initiate pivot to left

    1. initiates pivot to left using extremities

    2. pivots to left $<$ 90 degrees using extremities

    3. pivots to left 90 degrees using extremities

18. Supine, hands grasped by examiner : pulls self to sitting with head control

    0. does not initiate head control when pulled to sitting

    1. initiates head control when puooed to sitting

    2. partially pulls self to sitting with head control(head lag may be seen initilly)

    3. pulls self tl sitting with head control

19. Supine : rolls to right side, attains sitting

    0. does not initiate sitting from right side lying

    1. rolls to right side, initiates sitting

    2. rolls to right side, partially attains sitting

    3. rolls to right side, attains sitting

20. Supine : rolls to left side, attains sitting

    0. does not initiate sitting from left side lying

    1. rolls to left side, initiates sitting

    2. rolls to left side, partially attains sitting

    3. rolls to left side, attains sitting

21. Sitting on mat, supported at thorax by therapist : lifts headupright, maintains 3 seconds

    0. does not initiate head lift

    1. initiate head lift

    2. lifts head, does not attain upright, holds 3 seconds

    3. lifts head upright, maintains 3 seconds

      Note : child starts with head down on ♯21 & ♯22.

22. Sitting on mat, supported at thorax by therapist : lifts head to midline, maintains 10 seconds

    0. does not initiate head lift

    1. initiates head lift, does not attain midline

    2. lifts head to midline, maintains $<$ 10 seconds

    3. lifts head to midline, maintains 10 seconds

23. Sitting on mat with feet in front : maintains, arms propping, 5 seconds

    0. does not maintain with arms propping

    1. maintains, arms propping $<$ 1 second

    2. maintains, arms propping 1 to 4 seconds

    3. maintains, arms propping 5 seconds

24. Sitting on mat with feet in front : maintains, arms free, 3 seconds

    0. does not maintain unless 2 arms propping

    1. maintains, one arm propping

    2. maintains, arms free, $<$ 3 seconds

    3. maintains, arms free, 3 seconds

25. Sitting on mat with feet and small toy in front : leans forward, touches toy, re—erects without arm propping

    0. does not initiate leaning forward

    1. leans forward, does not re—erect

    2. leans forward, touches toy, re—erects with arm propping

    3. leans forward, touches toy, re—erects without arm propping

      Note : Place toy such that child must lean forward

26. Sitting on mat with feet in front : touchds toy placed 45 degrees behind child's right side, returns to start

    0. does not initiate touching toy

    1. initiates, does not reach behind

    2. reaches behind, does not touch toy, returns to start

    3. touches toy placed 45 degrees behind child's right side, returns to start

27. Sitting on mat with feet in front : touches toy placed 45 degrees behind child's left side, returns to start

    0. does not initiate touching toy

    1. initiates, does not reach behind

    2. reaches behind, does not touch toy, returns to start

    3. touches toy placed 45 degrees behind child's left side, returns to start

28. Right side sitting : maintains, arms free, 5 seconds

    0. does not maintain right side sitting

    1. maintains, both arms propping, 5 seconds

    2. maintains, right arm propping, 5 seconds

    3. maintains, arms free, 5 seconds

29. Left side sitting : maintains, arms free, 5 seconds

    0. does not maintain left side sitting

    1. maintains, both arms propping, 5 seconds

    2. maintains, left arm propping, 5 seconds

    3. maintains, arms free, 5 seconds

30. Sitting on mat : attains prone by extending arms and lowering with control

    0. does not initiate prone by extending arms

    1. lowers trunk and shifts weight on to arms, does not attain prone

    2. attains prone by extending arms, "crashes"down

    3. attains prone by extending arms and lowering with control

31. Sitting on mat with feet in front : attains 4 point over right side

    0. does not initiate 4 point over right side

    1. initiates 4 point over right side

    2. partially attains 4 point over right side 3. attains 4 point over right side

        Note : Remember the starting position is sitting(not prone) when considering the scoring.

            e.g. a child getting prone over the right side would be assigned a score of 2.

32. Sitting on mat with feet in front : attains 4 point over left side

    0. does not initiate 4 point over left side

    1. initiates 4 point over left side

    2. partially attains 4 point over left side

    3. attains 4 point over left side

33. Sitting on mat : pivots 90 degrees, without arms assisting

    0. does not initiate pivoting

    1. initiates pivot

    2. pivots 90 degrees with arms assisting

    3. pivots 90 degrees without arms assisting

34. Sitting on large bench : maintains, arms and feet free, 10 seconds

    0. does not maintain sitting on large bench

    1. maintains, arms proppong and feet supported, 10 seconds

    2. maintains, arms free and feet supported, 10 seconds

    3. maintains, arms and feet free, 10 seconds

35. Standing, facing small bench : attains sitting on same bench

    0. does not initiate sitting on small bench

    1. initiates sitting on small bench

    2. partially attains sitting on small bench

    3. attains sitting on small bench

36. On the floor : attains sitting on small bench

    0. does not initiate sitting on small bench

    1. initiates sitting on small bench

    2. partially attains sitting on small bench

    3. attains sitting on small bench

       Note : Standing is not allowed as the starting position in ♯ 36 & ♯ 37

37. On the floor : attains sitting on large bench, feet free

    0. does not initiate sitting on large bench

    1. initiates sitting on large bench

    2. partially attains sitting on large bench

    3. attains sitting on large bench, feet free

38. Prone : creeps forward 6 feet
    0. does not initiate creeping forward
    1. creeps forward < 2 feet
    2. creeps forward 2 to 5 feet
    3. creeps forward 6 feet
39. 4 point : maintains, weight on hands and knee, 10 seconds
    0. does not maintains weight on hands and knees
    1. maintains weight on hands and knees, < 3 seconds
    2. maintains weight on hands and knees, 3 to 9 seconds
    3. maintains weight on hands and knees, 10 seconds
40. 4 point : attains sitting then maintains, arms free
    0. does not initiate sitting
    1. initiates sitting
    2. attains sitting then maintains, arm proppoing
    3. attains sitting then maintains, arms free
41. Prone : attains 4 point, weight on hands and knee
    0. does not initiate 4 point
    1. initiates 4 point
    2. partially attains 4 point
    3. attains 4 point, weight on hands and knees
42. 4 Point : reaches forward with right arm, hand above shoulder level
    0. does not initiate reaching forward with right arm
    1. initiates reaching forward with right arm
    2. partially reaches forward with right arm
    3. reaches forward with right arm, hand above shoulder level
43. 4 Point : reaches forward with left arm, hand above shoulder level
    0. does not initiate reaching forward with left arm
    1. initiates reaching forward with left arm
    2. partially reaches forward with left arm
    3. reaches forward with left arm, hand above shoulder level
44. 4 Point : crawls or hitches forward 6 feet
    0. does not initiate crawling or hitching forward
    1. crawls or hitches forward < 2 feet
    2. crawls or hitches forward 2 to 5 feet
    3. crawls or hitches forward forward 6 feet
45. 4 Point : crawls reciprocally forward 6 feet
    0. does not initiate crawling forward reciprocally
    1. crawls reciprocally forward < 2 feet
    2. crawls reciprocally forward 2 to 5 feet
    3. crawls reciprocally forward 6 feet

46. 4 Point : crawls up 4 steps on hands and knees / feet
    0. does not initiate crawling up steps
    1. crawls up 1 step on hands and knee / feet
    2. crawls up 2 to 3 steps on hands and knees / feet
    3. crawls up 4 steps on hands and knees / feet
47. 4 Point : crawls backwards down 4 steps on hands and knees/feet
    0. does not initiate crawling backwards down steps
    1. crawls backwards down 1 step on hands and knees/feet
    2. crawls backwards down 2 to 3 steps on hands and knees/feet
    3. crawls backwards down 4 steps on hands and knees/feet
48. Sitting on floor : attains high kneeling, arms free, maintains 10 seconds
    0. when placed, does not maintain, 2 hands holding on
    1. when placed, maintains, 1 or 2 hands holding on, 10 seconds
    2. attains, 1 or 2 hands holding on, maintains 10 seconds
    3. attains, high kneeling, arms free, maintains 10 seconds
49. High kneeling : attains half kneeling on right knee, arms free, maintains 10 seconds
    0. when placed, does not maintains, 2 hands holding on
    1. when placed, maintains, 1 or 2 hands holding on, 10 seconds
    2. attains, 1 or 2 hands holding on, maintains 10 seconds
    3. attains half kneeling on right knee, arms free, maintains 10 seconds
50. High kneeling : attains half kneeling on left knee, arms free, 10 seconds
    0. when placed, does not maintains, 2 hands holding on
    1. when placed, maintains, 1 or 2 hands holding on, 10 seconds
    2. attains, 1 or 2 hands holding on, maintains 10 seconds
    3. attains half kneeling on left knee, arms free, maintains 10 seconds
51. High kneeling : kneel walks forward 10 steps, arms free
    0. does not initiate kneel walking forward
    1. kneel walks forward 10 steps, 2 hands holding on
    2. kneel walks forward 10 steps, 1 hands holding on
    3. kneel walks forward 10 steps, arms free
52. High floor : pulls to stand at large bench
    0. does not initiate pulling to stand
    1. initiates pulling to stand
    2. partially pulls to stand
    3. pulls to stand at large bench
53. Standing : maintains, 3 seconds, arms free
    0. does not maintain standing, holding on
    1. maintains, 3 seconds, 2 hands holding on
    2. maintains, 3 seconds, 1 hand holding on
    3. maintains, 3 seconds, arms free

54. Standing : holding on to large bench with one hand, lifts Rt foot, 3 seconds

   0. does not initiate lifting right foot

   1. holding on to large bench with 2 hands, lift right foot, < 3 seconds

   2. holding on to large bench with 2 hands, lift right foot, 3 seconds

   3. holding on to large bench with 1 hand, lift right foot, 3 seconds

55. Standing : holding on to large bench with one hand, lifts Lt foot, 3 seconds

   0. does not initiate lifting left foot

   1. holding on to large bench with 2 hands, lift left foot, < 3 seconds

   2. holding on to large bench with 2 hands, lift left foot, 3 seconds

   3. holding on to large bench with 1 hand, lift left foot, 3 seconds

56. Standing : maintains, 20 seconds, arms free

   0. does not maintain standing, arms free

   1. maintains, < 3 seconds, arms free

   2. maintains, 3 to 19 seconds, arms free

   3. maintains, 20 seconds, arms free

57. Standing on Rt leg : maintains, 10 seconds, arms free

   0. does not maintain standing, arms free

   1. maintains, < 3 seconds, arms free

   2. maintains, 3 to 9 seconds, arms free

   3. maintains, 10 seconds, arms free

58. Standing on Lt leg : maintains, 10 seconds, arms free

   0. does not maintain standing, arms free

   1. maintains, < 3 seconds, arms free

   2. maintains, 3 to 9 seconds, arms free

   3. maintains, 10 seconds, arms free

59. Sitting on small bench : attains standing without using arms

   0. does not initiate standing

   1. initiates standing

   2. attains standing using arms on bench

   3. attains standing without using arms

60. High kneeling : attains standing through half kneeling on Rt knee, without using arms

   0. does not initiate standing through half kneeling

   1. initiates standing through half kneeling, using arms

   2. attains standing through half kneeling on right knee, using arms

   3. attains standing through half kneeling on right knee, without using arm

61. High kneeling : attains standing through half kneeling on Lt knee, without using arms

   0. does not initiate standing through half kneeling

   1. initiates standing through half kneeling using arms

   2. attains standing through half kneeling on left knee, using arms

   3. attains standing through half kneeling on left knee, without using arms

62. Standing : lowers to sitting on floor with control, arms free

    0. dose not initiate lowering to floor

    1. lowers to floor, but "crashes" down

    2. lowers to floor, using arms for support and control

    3. lowers to sitting on floor with control, arms free

63. Standing : attains squat, without using arms

    0. does not initiate squat

    1. initiates squat

    2. attains squat, one hand holding on or touching floor

    3. attains squat, without using arms

64. Standing : picks up object from floor, arms free, returns to standing

    0. does not initiate picking up object froom floor

    1. initiates, does not touch object

    2. picks up object from floor, 1 hand supportint, returns to standing

    3. picks up object from floor, arms free, returns to standing

65. Standing, 2 hands on large bench : cruises 5 steps to right

    0. does not initiate cruising to right

    1. cruises < 1 steo to right

    2. cruises 1 to 4 steps to right

    3. cruises 5 steps to right

66. Standing, 2 hands on large bench : cruises 5 steps to left

    0. does not initiate cruising to left

    1. cruises < 1 step to right left

    2. cruises 1 to 4 steps to right left

    3. cruises 5 steps to right left

67. Standing : walks forward 10 steps, 2 hands held

    0. does not initiate walking forward, 2 hands held

    1. walks forward < 3 steps, 2 hands held

    2. walks forward 3 to 9 steps, 2 hands held

    3. walks forward 10 steps, 2 hands held

68. Standing : walks forward 10 steps, 1 hand held

    0. does not initiate walking forward, 1 hand held

    1. walks forward < 3 steps, 1 hand held

    2. walks forward 3 to 9 steps, 1 hand held

    3. walks forward 10 steps, 1 hand held

69. Standing : walks forward 10 steps, arms free

    0. does not initiate walking forward, arms free

    1. walks forward < 3 steps, arms free

    2. walks forward 3 to 9 steps, arms free

    3. walks forward 10 steps, arms free

70. Standing : walks forward 10 steps, stops, turns 180 degrees, returns

    0. walks forward 10 steps, does not stop without falling

    1. walks forward 10 steps, stops, does not initiate turn

    2. walks forward 10 steps, stops, turns $<$ 180 degrees

    3. walks forward 10 steps, stops, turns 180 degrees, returns

71. Standing : walks backwards 10 steps, arms free

    0. does not initiate walking backwards

    1. walks backwards $<$ 3 steps, arms free

    2. walks backwards 3 to 9 steps, arms free

    3. walks backwards 10 steps, arms free

72. Standing : walks forward 10 steps, carrying a large object with 2 hands

    0. does not initiate walking carrying large object

    1. walks forward 10 steps, carrying a small object with 1 hand

    2. walks forward 10 steps, carrying a small object with 2 hands

    3. walks forward 10 steps, carrying a large object with 2 hands

73. Standing : walks forward 10 consecutive steps between parallel lines 8 inches apart

    0. does not initiate walking forward between parallel lines 8 inches apart

    1. walks forward$<$3 consecutive steps between parallel lines 8 inches apart

    2. walks forward 3 to 9 consecutive steps between parallel lines 8 inches apart

    3. walks forward 10 consecutive steps between parallel lines 8 inches apart

74. Standing : walks forward 10 consecutive steps on a straight line 3/4″ wide

    0. does not initiate walking forward on a stright line 3/4″ wide

    1. walks forward $<$ 3 consecutive steps on a straight line 3/4″ wide

    2. walks forward 3 to 9 consecutive steps on a straight line 3/4″ wide

    3. walks forward 10 consecutive steps on a straight line 3/4″ wide

75. Standing : steps over stick at knee level, right foot leading

    0. does not iniate stepping over stick, right foot leading

    1. steps over stick 2 to 3 inches high, right foot leading

    2. steps over stick at mid calf level, right foot leading

    3. steps over stick at knee level, right foot leading

76. Standing : steps over stick at knee level, left foot leading

    0. does not initiate steppong over stick, left foot leading

    1. steps over stick 2 to 3 inches high, left foot leading

    2. steps over stick at mid calf level, left foot leading

    3. steps over stick at knee level, left foot leading

77. Standing : runs 15 feet, stops & returns

    0. does not initiate kicking

    1. runs $<$ 5 feet

    2. runs $<$ 15 feet, stops and returns

    3. runs 15 feet, stops and returns

78. Standing : kicks ball with right foot

    0. does not initiate kicking

    1. lifts right foot, does not kick

    2. kicks ball with right foot, but falls

    3. kicks ball with right foot

79. Standing : kicks ball with left foot

    0. does not initiate kicking

    1. lifts left foot, does not kick

    2. kicks ball with left foot, but falls

    3. kicks ball with left foot

80. Standing : jumps 12 inches high, both feet simultaneously

    0. does not initiate jump

    1. jumps < 3 inches high, both feet simultaneously

    2. jumps 3−11 inches high, both feet simultaneously

    3. jumps 12 inches high, both feet simultaneously

81. Standing : jumps forward 12 inches, both feet simultaneously, without falling, arms free

    0. does not initiate jump

    1. jumps < 3 inches high, both feet simultaneously

    2. jumps 3−11 inches high, both feet simultaneously

    3. jumps 12 inches high, both feet simultaneously

82. Standing with arms free : hops within a 24″ circle on right foot 10 consecutive times

    0. does not initiate hopping on right foot

    1. hops on right foot < 3 consecutive times

    2. hops on right foot 3 to 9 consecutive times

    3. hops within a 24″ circle on right foot 10 consecutive

    Note : Part of the right foot must stay in the circle

83. Standing with arms free : hops within a 24″ circle on left foot 10 consecutive times

    0. does not initiate hopping on left foot

    1. hops on left foot < 3 consecutive times

    2. hops on left foot 3 to 9 consecutive times

    3. hops within a 24″ circle on left foot 10 consecutive times

    Note : Part of the left foot must stay in the circle

84. Standing : walks up 4 steps, holding 1 rail, alternating feet

    0. does not initiate walking up steps, holding 1 rail

    1. walks up 2 steps, holding 1 rail, same foot leads consistently

    2. walks up 4 steps, holding 1 rail, alternating feet inconsistently

    3. walks up 4 steps, holding 1 rail, alternating feet

85. Standing : walks down 4 steps, holding 1 rail, alternating feet

    0. does not initiate walking down steps, holding 1 rail

    1. walks down 2 steps, holding 1 rail, same foot leads consistently

    2. walks down 4 steps, holding 1 rail, alternating feet inconsistently

    3. walks down 4 steps, holding 1 rail, alternation feet

86. Standing : walks up 4 steps, arms free, alternating feet

    0. does not initiate walking up steps, arms free

    1. walks up 2 steps, arms free, same foot leads consistently

    2. walks up 4 steps, arms free, alternating feet inconsistently

    3. walks up 4 steps, arms free, alternating feet

87. Standing : walks down 4 steps, arms free, alternating feet

    0. does not initiate walking down steps, arms free

    1. walks down 2 steps, arms free, same foot leads consistently

    2. walks down 4 steps, arms free, alternating feet inconsistently

    3. walks down 4 steps, arms free, alternating feet

88. Standing on 6″ step : jumps off, arms free, without falling feet

    0. does not initiate jumping off step

    1. jumps off, falls

    2. jumps off, uses hands on floor to avoid falling

    3. jumps off, arms free, without falling

참고문헌

1. 이청기, 박현, 조형제 : 재활의학 분야에서 사용하는 기능평가척도의 비교, 대한재활의학회지, 제18권 제3호, 191

2. 이충휘 외 2인 : 대동작 측정도구의 측정자간 신뢰도, 한국전문물리치료학회지 제2권 제1호

3. Bayley N., Bayley Scales of Infant Development(New York : Psychology,1969)

4. Bayley N., Bayley Scales of Infant Development. New York : Psychological Corporation, 1969.

5. Bleck E.E., Locomotor Prognosis in Cerebral Palsy. Developmental Medicine and Child Neurology, 17, pp. 18—25, 1975.

6. Bleck E. E., Locomotor Prognosis in Cerebral Palsy. Developmental Medicine and Child Neurology, 17, 1975.

7. Buchwald, E.G., Functional Training, Physical Therapy Review, 29, 1949.

8. Carmines E., Zeller R., Reliability and Validity Assessment,(London : Sage Publications Beverly Hills., 1979)

9. Deyo RA, Centor RM. Assessing the responsivemess of functional scales to clinical change : an analogy to diagnostic test performance. J chronic diseases 39 : 897—906, 1986.

10. Feinstein, A. R., Josephy, M.S., Wells, C. K., Scientific and Clinical Problems in Indexes of Functional Disability, Annals of Internal Medicine 105, 1986.

11. Folio R., DuBose R.F., Peabody Developmental Motor Scales IMRID Behavioal Sciences Monograph, no, 25. Nashiville, TN : George Peabody College, 1974.

12. Folio R., DuBose R.F., Peabody Development Motor Scales, IMRID Behavioral Sciencences Monograph, no 25 Nashiville, TN : George, 1974.

13. Guytt, GH, Walter S, Norman·G. Measuring change over time : assessing the usefulness of evaluative instruments. J Chronic Diseases of 40 : 171~180, 1987.

14. Granger, C., Hamilton, B., & Sherwin, F., Functional Independence Measure(Buffalo ; State University of New York Press, 1988).

15. Hardy, Marry—Anne, ABC, Assessment of behavial components, Charles C. Thomas Publisher, 1988.

16. Hardy, Mary—Anne ABC, Assessment of behavioral components, CharlesC. Thomas Publisher, 1988.

17. Harris S.R., Effects of Neurodevelopment Motor Scales,IMRID Behavioral Science Monograph (Nashville, TN : George Peabody College).

18. Hoskin T.A., Squires J.E., Development Assessment; A Test for Gross Motor and Reflex Development , Physical Therapy, 53, pp.117—126, 1973.

19. Kirshner B., Gutyatt G.H., A Methodological Framework For Assessing Health Indices, Journal of Chronic Diseases, 38, pp. 27—36, 1985.

20. Kirshner B., Guyatt G.H., A Methodological Framework For Assessing Health Indice, The Journal of Chronis Diseases, 38, 1985.

21. Kottke F.J., Lehmann J.F., Krusen's Handbook of Physical Medicine and Rehabilitation, 4th(ed) (Philadelphia：W.B.Saunders Co., 1990)

22. Kottke F.J., Lehmann J.F., Krusen's Handbook of Physical Medicine and Rehabilitation, 4th(ed) (Philadelphia : W.B. Saunders Co., 1990) pp.270—285.

23. Lilly L.A.,Powell N.J., Measuring the Effects of Neurodevelopmental treatment on

the Daily Living skills of a children with cerebral palsy, The American Journal of Occupational Therapy, 44, 1990.

24. Palisano RJ. Review of research on reliability and validity of the movement Assessment of Infants. Pediatrics in Physical Therapy 1 : 167~172, 1989.

25. Rusell D.J, Rosenbaum P.L, Cadman D.T, Gowland C., Hardy S., Jarvis S. Gross Motor Function Measure : A Means to Evaluate the Effects of Physical Therapy. Developmental Medicine and Child Neurology, 31, pp. 341−52, 1989.

26. Russel D., Rosenbaum P.L, Codman D.T., Gowland C, Hardy S, Jarvis S, The Gross Motor Function Measure : A Means to Evaluate the Effects of Physical Therapy, Developmental Medicine and Child Neurology, 31, 1989.

27. Sommerfeld D., Fraser B.A., Hensianer R. N., Beresford. C.V., Evaluation of Physical Therapy Service for Severely Mentally Impaired Students with Cerebral Palsy, Physical Therapy, 61, 1981.

28. Steel K.O., Spasoff R.A., The Testing of a Motor Control Assessment For Physical Handicapped Children, Final Report of Grant 677, Project NO., 00643, Ontario Ministry of Health, Toronto, 1986.

29. Steel K. O.,Spasoff R.A., The Testing of a Motor Control Assessment For Physical Handicapped Children, Final Report of Grant 677, Project No., 00643, Ontario Ministry of Health, Toronto, 1986.

30. World Health Organization, International Classification of Impairment ; Disability and handicap(Geneva ; auther, 1980).

31. Wright T., Nicholson J., Physiotherapy for the Spastic Child : An Evaluation, Developmental Medicine and Child Neurology, 15, 1973.