50 Years Ago in CORR

Rating Scale for Hip Disabilities

Carroll B. Larson, MD, CORR 1963;31:85–93

Ascertaining the level of disability of a patient or his or her response to treatment has long been important to doctors; although, until the 20th century, these attempts were typically based on the reporting of individual patients or small series of cases without formal collections of information in populations. E. Armory Codman, perhaps, was one of the earliest to recognize the need for systematic collection and storage of data on patients [3, 4, 6]. In his classic articles on the development of a registry for bone sarcomas [4, 5], he stressed the need for routine documentation of specific pieces of information. That information, as useful as it was for research purposes, was not easily quantified so as to give an indication of an individual patient's disability of that for a population. Robert Merle d'Aubigné and colleagues [7, 8, 10, 11], in a series of articles beginning in 1949, proposed three slightly different methods to quantify or categorize the disabilities of patients with hip disorders [2]. These scales were likely the first attempts to readily summarize the levels of function of patients with musculoskeletal disabilities, and other versions of them continue to be used today. Carroll Larson published what became known as the "Iowa hip score" in 1963 (Charts 1 and 2). In the scores proposed by Merle d'Aubigné each scoring level required the patient

to have a certain level of pain, mobility, and function. While many patients would fit within that scheme, others would not, because, for example, the pain level was high, yet the mobility

and function levels could be high rather than low. Further, function was gauged only by the ability to walk. The method proposed by Larson had the advantage of not requiring a given

CHART 1 Hip Evaluation		CHART 2 Hip Evaluation	
Name _____ Date _____ Age _____		Name _____ Diagnosis _____	
100-Point Scale for Hip Evaluation		Age _____ Sex _____ Date of Operation _____	
Total points _____		Date of follow-up _____	
A. Function (35 points)		Previous surgery: Date _____ Type _____	
Does most of housework or job which requires moving about 5		Subsequent surgery: Date _____ Type _____	
Dresses undaid (includes tying shoes and putting on socks) 5		I. Pain 40%	
Walks enough to be independent 5		None 40	
Sits without difficulty at table or toilet 4		Pain with fatigue 35	
Picks up objects from floor by squatting 3		Pain with weight-bearing:	
Bathes without help 3		Mild 30	
Negotiates stairs foot over foot 3		Moderate 20	
Carries objects comparable to suitcase 2		Severe 10	
Gets into car or public conveyance undaid and rides comfortably 2		Persistence with non-weight-bearing 10 (less than above)	
Drives a car 1		Continuous pain 0	
B. Freedom From Pain (35 points) Circle 1 only		II. Function Ability 30%	
No pain 35		Work and household duties:	
Pain only with fatigue 30		Full day—usual occupation 10	
Pain only with weight-bearing 20		Modified work or duties 6	
Pain at rest but not with weight-bearing 15		Severe restriction of former 2	
Pain sitting or in bed 10		Walking tolerances:	
Continuous pain 0		Long distances 10	
C. Gait 10 points (Circle 1 only)		Shorter distances 6	
No limp; no support 10		2 blocks or less 1	
No limp using cane 8		Self-Reliance:	
Abductor limp 8		Dresses self undaid 3	
Short-leg limp 8		Help with shoes, socks 2	
Needs 2 canes 6		Sits at table and toilet 3	
Needs 2 crutches 4		Stairs:	
Cannot walk 0		Normal 2	
D. Absence of Deformity 10 points		One at a time 1	
No fixed flexion over 30° 3		Gets into car or public conveyance without difficulty 2	
No fixed adduction over 10° 3		III. Gait 15%	
No fixed rotation over 10° 2		No limp—No support 15	
Not over 1" shortening (ASIS-MM) 2		No limp—with cane 12	
E. Range of Motion 10 points		Limp—mild—without cane 12	
Flexion-extension (normal 140°) 0		Limp—mild—with cane 9	
Abduction-adduction (normal 80°) 0		Limp—moderate—without cane or crutch 9	
External-internal rotation (normal 80°) 0		Limp—moderate—with cane or crutch 6	
Total degrees 0		Limp—severe—without cane or crutch 3	
Points 1pt./30°		Limp—severe—with cane or crutch 2	
Muscle Strength (no points)		Two canes or crutches 1	
Straight leg-raising:		IV Anatomic Assessment 15%	
Less than gravity _____ Gravity _____		A. Motion:	
Gravity + resistance _____		Flexion—Up to 80° in range 0°–100° x 0.1 8	
Abduction:		Abduction—Up to 20° in range 0°–30° x 0.1 2	
Less than gravity _____ Gravity _____		B. Shortening:	
Gravity + resistance _____		None—½" 3	
Extension:		½"—1" 2	
Less than gravity _____ Gravity _____		1"—2" 1	
Gravity + resistance _____		C. Trendelenberg—absent 2	
		100%	

Charts 1 and 2 From "Rating Scale for Hip Disabilities" are shown. (Reprinted with permission and © Lippincott Williams & Wilkins, from Larson CB. Rating Scale for Hip Disabilities. *Clin Orthop Relat Res.* 1963;31:85–93.)

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score to reflect a composite of parameters, but rather scoring each parameter separately. Further, it included other aspects of function (such as bathing without help) and deformity (Charts 1 and 2). A subsequent hip scoring system based on such individual aspects was published by William Harris in 1969 [9]. That score differed in details compared to that of Larson, but not in the concept of scoring each item separately. The scoring systems proposed by Merle d'Aubigné, Larson, and Harris arbitrarily weighted the parameters without any sort of validation of those weightings. All three scoring systems continue to be reported today (sometimes in modified forms), although all three are physician-generated. Such systems are not only prone to bias on the part of the rating physician but may not consider those things most important to patients.

In the past few decades, therefore, patient-generated ratings have been increasingly introduced [1, 13], and these are now the standard for reporting the levels of patient disability. Since the original descriptions of the three hip scoring systems were introduced, the field of measuring outcomes has become far more sophisticated and complex, demanding the expertise of a wide array of scientists. Early investigators, such as Merle d'Aubigné, Larson, and Harris, evidently did not

consider validating their scores or determining their reliability. Multiple forms of validation characterize any rigorous assessment, including: face validity (the instrument measures what one wants or “makes sense”), content validity (the instrument captures all aspects of what one wants to measure), construct validity (the instrument correlates with what one wants to measure or will actually measure it), and criterion-related validity (the instrument predicts an outcome). (Readers should be aware these sorts of definitions vary considerably in the field of psychometrics.) Some early outcome instruments were later validated but typically in limited ways. Even contemporary outcomes are frequently inadequately validated. Patient satisfaction is arguably among the most important of outcomes, yet finding valid and reliable ways of assessing satisfaction has eluded us. In an analysis of 195 studies from 139 journals, Sitzia [12] found only 46% of studies reported any validity or reliability data, and only 6% reported content validity and criterion or construct validity and reliability. He concluded, “With few exceptions, the study instruments in this sample demonstrated little evidence of reliability of validity. Moreover, study authors exhibited a poor understanding of the importance of these properties in the assessment of satisfaction.” Despite the progress in

developing better outcome instruments, we have a long way to go.

Nonetheless, patient rating systems, such as that proposed by Larson, advanced the manner in which surgical treatments of musculoskeletal disorders could be assessed and added some objectivity to what had previously been subjective interpretations.

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References

1. Bellamy N, Buchanan WW, Goldsmith CH, Campbell J, Stitt LW. Validation study of WOMAC: a health status instrument for measuring clinically important patient relevant outcomes to antirheumatic drug therapy in patients with osteoarthritis of the hip or knee. *J Rheumatol*. 1988;15:1833–1840.
2. Biau DJ, Brand RA. Robert Merle d'Aubigne, 1900–1989. *Clin Orthop Relat Res*. 2009;467:2–6.
3. Brand RA. Ernest Amory Codman, MD, 1869–1940. *Clin Orthop Relat Res*. 2009;467:2763–2765.
4. Codman EA. The Registry of Bone Sarcoma as an Example of the End-Result Idea in Hospital Organization. *Bull Amer Coll Surg*. 1924;8:34–38.
5. Codman EA. Registry of Bone Sarcoma: Part I.—Twenty-Five Criteria for Establishing the Diagnosis of Osteogenic Sarcoma; Part II.—Thirteen Registered Cases of “Five Year Cures” Analyzed According to

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- These Criteria. *Surg Gynecol Obstet*. 1926;42:381–393.
6. Codman EA. The classic: the registry of bone sarcomas as an example of the end-result idea in hospital organization. 1924. *Clin Orthop Relat Res*. 2009;467:2771–2782.
 7. d'Aubigne RM, Postel M. Functional results of hip arthroplasty with acrylic prosthesis. *J Bone Joint Surg Am*. 1954;35:451–475.
 8. d'Aubigne RM, Postel M. The classic: functional results of hip arthroplasty with acrylic prosthesis. 1954. *Clin Orthop Relat Res*. 2009;467:7–27.
 9. Harris WH. Traumatic arthritis of the hip after dislocation and acetabular fractures: treatment by mold arthroplasty. An end-result study using a new method of result evaluation. *J Bone Joint Surg Am*. 1969;51:737–755.
 10. Merle D'Aubigne R, Cauchoix J, Ramadier JV. [Quantitative evaluation of the function of the hip. Application to the study of the results of operations mobilizing the hip]. *Rev Chir Orthop*. 1949;35:5–12.
 11. Merle d'Aubigne R, Cauchoix J, Ramadier, Postel. [250 Arthroplasties of the hip with interposition of inert substances; first results.]. *Mem Acad Chir (Paris)*. 1951;77:199–209.
 12. Sitzia J. How valid and reliable are patient satisfaction data? An analysis of 195 studies. *Int J Qual Health Care*. 1999;11:319–328.
 13. Ware JE, Jr., Sherbourne CD. The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. *Med Care*. 1992;30:473–483.

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