

A Coding Procedure for Classification of Cleft Lip and Cleft Palate

PETER A. McCABE

Groton, Connecticut

While relatively great advances have been made in cleft palate rehabilitation programs in the past decade, a general lack of common ground has been evident with regard to diagnostic classification of cleft lip and cleft palate. This lack of consensus is seen in the various diagnostic terminologies used in the research literature. Recognizing the confusion which exists within the literature, the American Cleft Palate Association submitted a proposal for morphological classification of cleft lip and cleft palate (1). Two years later, the Association, through its nomenclature committee, published a 'standard' classification system (2). This classification system offers many advantages to professional workers, one advantage being that research reports from other rehabilitation centers may be analyzed in perspective without the confusion of differing diagnostic classifications. In addition, rehabilitation centers, using the standard classification system, can more fully cooperate with other centers in mutual research programs. Finally, rehabilitation centers can adopt this classification system for their own case files, allowing more comprehensive statistical analysis to be developed at periodic intervals.

Unfortunately, a review of current research literature does not indicate that the ACPA nomenclature classification is being used to any great extent. Research reports continue to use terminologies which may be more adequate for their own use, but which may also be confusing and vague to professional workers in other centers. It is felt that part of the lack of response in adopting this new classification system is due to the possibility that, in its present form, it is difficult to use.

Classification systems are difficult to implement. It must be fully recognized that the value of any system is only as great as the extent of cooperation of the individuals using it. A long detailed procedure may simply be a waste of time, since, over a period of time, abbreviations may be self-imposed and the system would then become relatively meaningless.

The purpose of this paper is to present a method of coding for classification of cleft lip and cleft palate. Adoption of this coding procedure

Mr. McCabe, formerly NDEA Fellow in Speech Pathology at The University of Illinois, is Research Audiologist with The C. W. Shilling Auditory Research Center, Groton, Connecticut.

would simplify the procedure to be followed to adequately use the present classification system.

The coding procedure to be described makes use of electronic data processing (EDP) technique. This particular technique is chosen because most rehabilitation centers are connected with medical or university centers where relatively large EDP service facilities are available. One advantage to the use of EDP procedures with the recording of data on punched cards is that additional data (post-operative reports, socioeconomic data, psychological test scores, etc.) may be added at a later date with relatively little additional work. Another is that EDP service facilities typically provide technical advice, and research personnel are relieved of the work of preparing material for analysis, running of EDP equipment, etc. In other words, less time must be spent in analysis of available data by rehabilitation center personnel. Fortunately, adoption of an EDP coding procedure for diagnostic classification does not require exclusive use of EDP facilities. A properly developed coding procedure allows research personnel to visually review diagnostic information without having to process information through complex equipment. Elementary statistical evaluations may also be made without using EDP facilities. The chief advantage, however, in the use of a coding procedure is that it offers a well-organized regimen which is relatively easy to implement and use.

The establishment of an EDP program requires a series of developmental stages, one stage being dependent upon the other. First, a comprehensive manual must be furnished which allows examiners to classify diagnosis under the proper heading. Second, a coding manual must be available for rapid references during diagnostic procedures. Third, a coding sheet must be developed from which data cards are punched. Finally, the data card is prepared.

Research personnel must have a thorough knowledge of the comprehensive manual so that, during diagnostic procedures, the coding manual may be used to rapidly identify the appropriate code. Secretarial and nursing personnel can fill out the coding sheet with patient identification and diagnostic classification so that hospital and clinic files will be complete.

Coding Manual

In this instance, the paper by Harkins and associates (2) serves as the comprehensive manual from which a coding manual may be developed. The coding manual, serving as a rapid reference source, must follow the general layout of the data card. The data card is divided into 80 vertical columns and 12 horizontal rows. For most purposes, only 10 rows (0-9 positions) are used. For this specific application, eight fields (column segments) are designated: a) date, b) clinic identification, c) patient age, d) hospital identification, e) prepalate section, f) palate section, g) prepalate and palate section, and h) associated anomalies.

The classification system presented here (and by Harkins) is divided into two main sections: prepalate and palate. The prepalate section is composed of the lip and alveolar process to the incisive foramen. The palate section includes the hard and soft palate to the incisive foramen of the hard palate. A third section has been added to accommodate those individuals with involvement of both the prepalate and the palate. Under each of the subgroups within each section, allowance has been made for the location of cleft, extent of cleft, and width of cleft. The coding manual is presented in Appendix I with explanation of coding procedure to follow.

The location of cleft is associated with the columns, the choice being made to give a separate column to each subclassification of cleft, thus allowing the extent of the cleft to be identified in the row.

Extent of the cleft is located in the row of the data card. While in the majority of cases only three of a possible 10 positions are used, it is felt that this allocation of space is justified for the most precise description. Extents are labeled, for the most part, as $\frac{1}{3}$, $\frac{2}{3}$, or $\frac{3}{3}$. The use of $\frac{3}{3}$ indicates the completeness of the cleft up to and including the boundary used in the classification. Other systems of extent are used when feasible, such as in Column 29 (prolabium), where extents of small, medium, or large is used. When a submucous cleft is identified, the extent may be $\frac{1}{3}$, $\frac{2}{3}$, and $\frac{3}{3}$, or it may be right, left, or median. In Column 45 (prepalate protrusion), as in subsequent columns, the extent is marked by the use of none, slight, moderate, or marked, indicating, as with the use of $\frac{1}{3}$, $\frac{2}{3}$, or $\frac{3}{3}$, the amount of involvement.

Columns 32, 39, 48, 52, 56, and 67 indicate width of the cleft at its widest point. By the use of inside calipers, measurements may be made in millimeters. In each of the above columns, the measurement is taken in units of 4 mm with row 8 being reserved for unavailable data (non-cooperative child, etc.), and row 9 being reserved for data which are unknown. The columns notating width are not included within each sublocation and extent area since this would necessitate too many columns. The location of these columns is following the location area (subgrouping).

Column 54 indicates the location of the vomer attachment in the hard palate. No identification is made for the formerly popular terms, such as right unilateral cleft, which only classified the location of attachment of the vomer bone. Instead, in the present classification, separate location is made for attachment.

Column 57 locates the cleft of the soft and hard palates. Basically the same classification is used as with the other clefts, with $\frac{1}{6}$, $\frac{2}{6}$, and $\frac{3}{6}$ extents. In this case, one may think of the extents $\frac{1}{6}$, $\frac{2}{6}$, and $\frac{3}{6}$ to be the extents within the soft palate region and $\frac{4}{6}$, $\frac{5}{6}$, and $\frac{6}{6}$ as being the extents within the hard palate region. The use of six segments simply extends the classification for ease of use.

Column 58, locating isolated clefts of the soft and hard palate, is much

TABLE 1. Diagnostic portion of a sample coding sheet.

<i>Column</i>	<i>Identification</i>	<i>Row</i>
57	Cleft of hard and soft palate	4
54	Vomer attachment	0
52	Width cleft: soft palate	1
56	Width cleft: hard palate	0

the same as Column 57. Instead of using the six segment choice to include the boundary of the cleft as in the case of Column 57, simply use this six-segment choice to locate the sublocation in the appropriate region of the hard or soft palate.

Columns 59–66 are used to designate clefts of the prepalate and palate. This eight-column spread is used in order to correctly locate the cleft extent. One can see that these columns are only duplications of former columns. In this arrangement, a cleft can be correctly identified even though it covers the three areas of the prepalate, the soft palate, and the hard palate.

Columns 68–75 include infrequent anomalies sometimes seen in cleft palate rehabilitation centers. Columns 70–75 are recorded as present and then reported on separate sheets giving additional information.

Coding Sheet

The last stage of the EDP procedure that clinic personnel will be initially involved with is the coding sheet. Information appearing on the coding sheet will dictate the amount of data which will appear on the data card. There will be differences in coding sheet design between institutions but the basic information to be provided should remain unchanged.

A sample coding sheet is seen in Appendix II. The top of the coding sheet contains space for patient identification, and clinic and hospital identification numbers. The bottom of the coding sheet may contain eight unmarked classifications, as many as required being used to correctly classify diagnostic information. Table 1 presents diagnostic information as might be seen on a typical coding sheet. A review of this coding sheet at some future date would indicate that this patient exhibited a cleft of the hard and soft palate with vomer attachment to the right with width of the cleft being greatest in the region of the soft palate (6 mm) and narrowest in the region of the hard palate (2 mm). Perhaps more importantly, this information in its coded form will subsequently facilitate statistical analyses.

Discussion

The chief advantages to coded diagnostic information are that it offers a standard diagnostic classification system and that it facilitates future

statistical analyses. Use of this coding procedure should alleviate much of the confusion about diagnoses widely used in the field of cleft palate research. Moreover, through the use of a standard diagnostic coding procedure, institutions will be able to cooperate in research programs which heretofore have been impractical. In addition, specialists working within a cleft palate team will be able to more closely evaluate their needs and contributions. A prosthodontist, for instance, may analyze the proportion of cases which require prosthetic devices in relation to the width of the cleft in the soft palate region. This is meaningful information which is usually lost in clinic files, or which can be extracted with great effort from incomplete existing information.

The overall aim in the development of a coding procedure for classification of cleft lip and cleft palate is to complement existing rehabilitative efforts being made by diagnostic and service teams and individual workers.

Summary

A coding procedure for classification of cleft lip and cleft palate is described which complements the official standard morphological classification system of the American Cleft Palate Association and which makes use of electronic data processing technique. Implementation of this coding procedure offers rehabilitation center personnel a more workable diagnostic classification system and facilitates statistical analyses of records.

reprints: *Peter A. McCabe*

*C. W. Shilling Auditory Research Center
Groton, Connecticut 06340*

References

1. HARKINS, C. S., BERLIN, A., HARDING, R. L., LONGACRE, J. J., and SNODGRASSE, R. M., A classification of cleft lip and cleft palate. *Plastic reconstr. Surg.*, 29, 31-39, 1962.
2. HARKINS, C. S., BERLIN, A., HARDING, R. L., LONGACRE, J. J., and SNODGRASSE, R. M., Report of the nomenclature committee: Proposed morphological classification of congenital cleft lip and cleft palate. *Cleft Palate Bull.*, 10, 11, 1960.

APPENDIX I. Coding Manual

Column		Row	
Number	Identification	Number	Identification
1-6	date		
7-10	clinic identification number		
11	(omit)		
12-13	patient age		
14	(omit)		
15-22	hospital identification number		
23	(omit)		
CLEFTS OF THE PREPALATE			
24	unilateral cleft of lip, right	0	1/3
		1	2/3
		2	3/3
25	unilateral cleft of lip, left	0	1/3
		1	2/3
		2	3/3
26	bilateral cleft of lip, right	0	1/3
		1	2/3
		2	3/3
27	bilateral cleft of lip, left	0	1/3
		1	2/3
		2	3/3
28	median cleft of lip	0	1/3
		1	2/3
		2	3/3
29	prolabium	0	small
		1	medium
		2	large
30	congenital scar of lip, right	0	1/3
		1	2/3
		2	3/3
31	congenital scar of lip, left	0	1/3
		1	2/3
		2	3/3
32	width of cleft lip (widest point)	0	2 mm
		1	6 mm
		2	10 mm
		3	14 mm
		4	18 mm
		5	22 mm
		6	26 mm
		7	30 mm
		8	unavailable data
		9	unknown
33	unilateral cleft of alveolar process, right	0	1/3
		1	2/3
		2	3/3
34	unilateral cleft of alveolar process, left	0	1/3
		1	2/3
		2	3/3
35	bilateral cleft of alveolar process, right	0	1/3
		1	2/3
		2	3/3
36	bilateral cleft of alveolar process, left	0	1/3
		1	2/3
		2	3/3
37	median cleft of alveolar process	0	1/3
		1	2/3
		2	3/3
38	submucous cleft of alveolar process	0	right
		1	left
		2	median
39	width of cleft: alveolar process (widest point)	0	2 mm
		1	7 mm
		2	10 mm
		3	14 mm
		4	18 mm
		5	22 mm
		6	26 mm
		7	30 mm
		8	unavailable data
		9	unknown
40	unilateral cleft of the prepalate, right	0	1/3
		1	2/3
		2	3/3
41	unilateral cleft of the prepalate, left	0	1/3
		1	2/3
		2	3/3
42	bilateral cleft of the prepalate, right	0	1/3
		1	2/3
		2	3/3
43	bilateral cleft of the prepalate, left	0	1/3
		1	2/3
		2	3/3

APPENDIX I. Coding Manual—Continued.

Column		Row	
Number	Identification	Number	Identification
44	median cleft of the prepalate	0	1/4
		1	2/4
		2	3/4
45	prepalate protrusion	0	none
		1	slight
		2	moderate
		3	marked
46	prepalate rotation	0	none
		1	slight
		2	moderate
		3	marked
47	prepalate arrest (medium cleft)	0	none
		1	slight
		2	moderate
		3	marked
48	width of the prepalate cleft (widest point)	0	2 mm
		1	6 mm
		2	10 mm
		3	14 mm
		4	18 mm
		5	12 mm
		6	26 mm
		7	30 mm
		8	unavailable data
		9	unknown
CLEFTS OF THE PALATE			
49	cleft of soft palate (posterior-anterior direction)	0	1/4
		1	2/4
		2	3/4
50	palatal shortness	0	none
		1	slight
		2	moderate
		3	marked
51	submucous cleft of the soft palate	0	1/4
		1	2/4
		2	3/4
52	width of the cleft: soft palate (widest point)	0	2 mm
		1	6 mm
		2	10 mm
		3	14 mm
		4	18 mm
		5	22 mm
		6	26 mm
		7	30 mm
		8	unavailable data
		9	unknown
53	cleft of the hard palate (anterior-posterior direction)	0	1/4
		1	2/4
		2	3/4
54	vomer attachment	0	right
		1	left
		2	absent
55	submucous cleft of the hard palate	0	1/4
		1	2/4
		2	3/4
56	width of the cleft: hard palate (widest point)	0	2 mm
		1	6 mm
		2	10 mm
		3	14 mm
		4	18 mm
		5	22 mm
		6	26 mm
		7	30 mm
		8	unavailable data
		9	unknown
57	cleft of the hard and soft palate (code 0-2 refers to average cleft of soft palate seen in column 49 while code 3-5 refers to average cleft of hard palate seen in column 53)	0	1/6
		1	2/6
		2	3/6
		3	4/6
		4	5/6
		5	6/6
58	isolated cleft of the soft or hard palate (dividing each palate into three equal extents, locate isolated cleft to nearest extent)	0	1/6
		1	2/6
		2	3/6
		3	4/6
		4	5/6
		5	6/6
CLEFTS OF THE PREPALATE AND PALATE			
59	unilateral cleft of prepalate, right	0	1/3
		1	2/3
		2	3/3
60	unilateral cleft of prepalate, left	0	1/3
		1	2/3
		2	3/3

APPENDIX I. Coding Manual—*Concluded.*

Column		Row	
Number	Identification	Number	Identification
61	bilateral cleft of prepalate, right	0	3/8
		1	2/8
		2	1/8
62	bilateral cleft of prepalate, left	0	3/8
		1	2/8
		2	1/8
63	median cleft of prepalate	0	3/8
		1	2/8
		2	1/8
64	cleft of soft palate	0	3/8
		1	2/8
		2	1/8
65	cleft of hard palate	0	3/8
		1	2/8
		2	1/8
66	vomer attachment	0	3/8
		1	right
		2	left
67	width of cleft: prepalate and palate (widest point)	0	absent
		1	2 mm
		2	6 mm
		3	10 mm
		4	14 mm
		5	18 mm
		6	22 mm
		7	26 mm
		8	30 mm
ASSOCIATED ANOMALIES		9	unavailable data
68	mandibular cleft of lip	0	3/8
		1	2/8
		2	1/8
69	cleft of the mandible	0	3/8
		1	2/8
		2	1/8
FOR ITEMS 70-75, IF CODE YES, USE SEPARATE SHEET FOR ADDITIONAL INFORMATION			
70	lip pits	0	yes
71	nasal-ocular cleft	1	no
		0	yes
72	oro-ocular cleft	1	no
		0	yes
73	oro-medial cleft	1	no
		0	yes
74	oro-lateral cleft	1	no
		0	yes
75	oro-aural cleft	1	no
		0	yes
		1	no

APPENDIX II: Sample Coding Sheet, Showing First 21 Columns

Name:_____ Age:_____ Date/birth:_____ Sex:_____

Address:_____

(street)(city)(state)

Column	Identification	Row
1	date	0 1 2 3 4 5 6 7 8 9
2		0 1 2 3 4 5 6 7 8 9
3		0 1 2 3 4 5 6 7 8 9
4		0 1 2 3 4 5 6 7 8 9
5		0 1 2 3 4 5 6 7 8 9
6		0 1 2 3 4 5 6 7 8 9
7	clinic ID no.	0 1 2 3 4 5 6 7 8 9
8		0 1 2 3 4 5 6 7 8 9
9		0 1 2 3 4 5 6 7 8 9
10		0 1 2 3 4 5 6 7 8 9
12	patient age	0 1 2 3 4 5 6 7 8 9
13		0 1 2 3 4 5 6 7 8 9
14	hospital chart no.	0 1 2 3 4 5 6 7 8 9
15		0 1 2 3 4 5 6 7 8 9
16		0 1 2 3 4 5 6 7 8 9
17		0 1 2 3 4 5 6 7 8 9
18		0 1 2 3 4 5 6 7 8 9
19		0 1 2 3 4 5 6 7 8 9
20		0 1 2 3 4 5 6 7 8 9
21		0 1 2 3 4 5 6 7 8 9