



The Cleft Audit Protocol for Speech—Augmented(CAPS-A)



دانشگاه علوم پزشکی خدمات بهداشتی درمانی ایران





discription

- Develop an assessment tool for use in intercenter audit studies of cleft speech and to record and report speech outcomes, providing an indication of treatment needs and continuing burden of care. *(GOS.SP.ASS; Sell et al., 1994, 1999: too detailed for use in audit studies.)*
- three cleft speech experts who identified the key features required from existing assessment measures
- Criterion, content and face validity, Intra and interrater reliability focus previous study: on velopharyngeal function with minimal detail recorded about **consonant errors**.

- John, A., Sell, D., Sweeney, L., Harding-Bell, A., & Williams, A. (2006). The cleft audit protocol for speech—augmented: A validated and reliable measure for auditing cleft speech. *The Cleft palate-craniofacial journal*, 43(3), 272-288.



sampling

- ◉ The speech samples consisted of counting from 1 to 20, repetition of the GOS.SP.ASS. 98 sentences, and a conversational speech sample
- ◉ At first conversational speech(audio)
- ◉ Second counting and sentences(audio)
- ◉ And then video recording to rate the visual aspects of speech, including grimace, dentalization, nasal versus oral production of sounds such as / s t1 /, and some forms of double articulation

سیستم پارامترهای جهانی - فرم تک واژه های فارسی

(تهیه و تنظیم: فاطمه درخشنده - آزاده امیربان)

پیشنهاد	پاسخ			جمله یا عبارت هدف (صدای هدف پررنگ شده است)	صدای هدف
	تعداد خطاهای همخوان هدف	پرخشومی (√)	تمام همخوان های هدف صحیح (√)		
				tupe P uja pare fod	/p/
				baba sib b ede	/b/
				fil ruje barf f raft	/f/
				tuti je tut t id	/t/
				Hoda d aer zaed	/d/
				pe s aer sos dare	/s/
				Reza sa z zad	/z/
				fif ta pæ f e	/f/
				bæt f e tʃar ta pit f dare	/tʃ/
				dʒud ʒ e je hævid ʒ did	/dʒ/
				je ke j ke kut j ik	/k/
				je gæle go g	/g/
					/x/

پیشنهاد	پاسخ			واژه ی هدف (موقعیت هدف رنگی شده است)	صدای هدف
	خطای همخوان هدف ^۱ (آوانگاری)	واکه ^۱ پرخشومی (√)	همخوان هدف صحیح (√)		
				[pa] پا	/p/
				[tæpe] ته	
				[tup] توپ	
				[bil] بیل	/b/
				[baba] بابا	
				[læb] لب	
				[fil] فیل	/f/
				[felfel] فلفل	
				[lif] لیف	
				[tab] تاب	/t/
				[tuti] طوطی	
				[sut] سوت	
				[daer] در	/d/
				[pærde] پرده	
				[dud] دود	

1. /p/ Paul likes apple pie
[p- -p- p-]
2. /b/ Ben is a baby boy
[b- b- -b- b-]
3. /t/ Tim told Peter, 'Put a hat on'
[t- t- -t- -t -t]
4. /d/ Daddy mended the door
[d- -d- -nd- -d d-]
5. /k/ Katy's baking a cake
[k- -k- -k]
6. /g/ Gary's got a bag of Lego
[g- g- -g -g-]
7. /f/ The phone fell off the shelf
[f- f- -f -f]
8. /v/ Vicky's very clever
[v- v- -v-]
9. /s/ I saw Sam sitting on a bus
[s- s- s- -s]
10. /z/ The zebra lives at the zoo
[z- -z z-]
11. /ʃ/ The fish shop was shut
[-ʃ ʃ- ʃ-]
12. /tʃ/ Charlie's watching a football match
[tʃ- -tʃ- -tʃ]
13. /dʒ/ John jumped off a bridge
[dʒ- dʒ- -dʒ]
14. /m/ Mum came home early
[m--m -m -m]
15. /n ŋ/ I saw a robin in a nest: singing a song
[-n -n n- : -ŋ -ŋ -ŋ]

کشش تولید واکه ی /l/ به مدت ۴ ثانیه.....

کشش تولید واکه ی /u/ به مدت ۴ ثانیه.....

کشش تولید واکه ی /ə/ به مدت ۴ ثانیه.....

شمارش اعداد از ۱۰ تا ۱۰۰.....

تکرار موارد زیر:

ردیف	هجاء	نتائج	جملات	نتائج
۱	پاپاپاپا		توپ پوپا پاره شد	
۲	بابابابا		بابا به بهار آب داد	
۳	فافافافا		فیل روی برف رفت	
۴	تاتاتاتا		طوطی به توت دید	
۵	دادادادا		هدی در زد/ دست داداش درد گرفت	
۶	کاکاکاکا		یک کپک / کوچیک / کاوه کاکالو خورد	
۷	گامگامگام		به گله گرگ	
۸	ساساسا		پسر سس داره/ سارا سیپ دوست داره	
۹	شاشاشاشا		شیش تا پشه/ شادی شیش تا شکلات داره	
۱۰	زازازازا		رضا ساز زد	
۱۱	چاچاچاچا		بچه چهارتا پیچ داره	
۱۲	چاچاچاچا		چوجه به هویج داره	

2.CAPS:

Appendix 2

Cleft Audit Protocol for Speech - Augmented

Please rate all items. Omissions are ambiguous. Circle number '8' only if it is not possible to make a judgement.

Name:		Date:	Audit No:
Date of Birth:	Age:	Centre:	
Male/Female	First Language:	Therapist:	

Type of Cleft/Structure:

Background information (e.g. current URTI, Voice disorder)

Insufficient speech sample to audit the case: 8

1 Intelligibility/Distinctiveness of speech

Rating	Description
0	Normal
1	Different from other children's speech, but not enough to cause comment.
2	Different enough to provoke comment, but possible to understand most speech.
3	Only just intelligible to strangers.
4	Impossible to understand.

8

2 Voice

Rating	Voice Characteristics
0	Absent
1	Distinctive or abnormal voice quality

8

3 Resonance

3a Hyponasality

Rating	Description
0	Absent
1	Borderline - minimal
2	Mild - evident on close vowels e.g. <i>egg, three, six</i> /u, i, e/
3	Moderate - evident on open and close vowels
4	Severe - evident on vowels and voiced consonants

8

3b Hyponasality

Rating	Description
0	Absent
1	Mild - partial denasalization of nasal consonants and adjacent vowels
2	Marked - denasalization of nasal consonants /m, n, ŋ/ and adjacent vowels

8

4 Nasal Airflow

4a Audible Nasal Emission

Rating	Description
0	Absent on pressure consonants
1	Occasionally heard on pressure consonants < 3 examples on different sounds
2	Frequently heard on pressure consonants ≥ 3 examples on different sounds

8

4b Nasal Turbulence

Rating	Description
0	Absent on pressure consonants
1	Occasionally heard on pressure consonants < 3 examples on different sounds
2	Frequently heard on pressure consonants ≥ 3 examples on different sounds

8

5 Grimace

Rating	Grimace
0	Absent
1	Grimace behavior - sufficient to distract the listener

8

6 Consonant Production

5a Consonant Production																						
Realization	Labial			Dental			Alveolar							Post Alveolar			Velar			Glottal	S cluster	
Initial Realization																						
Correct Target	m	p	b	f	v	ɸ	n	l	t	d	s	z	ʃ	tʃ	ʒ	ʊ	k	g	h	st	skr s	
Final Realization																						

6b Observations of spontaneous speech: note any distinctive characteristics in spontaneous speech/sound imitation

7 Cleft Type Characteristics (CTCs) Summary

7a	Cleft Type Characteristics (CTCs) Rate individual CTCs	Absent	≤ Two consonants affected	Three or more consonants affected
Anterior Oral CTCs				
1	Dentalization/inter-dentalization e.g. [t] [t̪]			
2	Labialization / Internal e.g. [ts] [tʃ]			
3	Palatalization / palatal e.g. [tʃ] [tʃʰ]			
Posterior Oral CTCs				
4	Double articulation e.g. [tʃ] [tʃʰ]			
5	Backed to velar/uvular e.g. /t d s n l/ => [k g x ŋ] [q ɣ ʁ N]			
Non-Oral CTCs				
6	Pharyngeal articulation e.g. [ħ]			
7	Glottal articulation e.g. [ʔ] [h]			
8	Active nasal fricatives e.g. [m̥] [n̥] [ŋ̥]			
9	Double articulation e.g. [bʔ] [dʔ]			
Passive CTCs				
10	Weak and/or nasalized consonants e.g. [b̥] [d̥] [d̥]			
11	Nasal realization of plosives e.g. b => [m], d => [n], and/or suspected passive nasal fricative e.g. t => [t̪m̥], [t̪n̥] or s / ʃ => [s̪m̥] [s̪n̥]			
12	Gliding of fricatives/affricates /t/ => [t̪w], /s/ => [s̪j] / => [ʃj]			

7b	Non-cleft speech immaturities / errors	Absent	Present	Describe/ Transcribe examples e.g. fronting, stopping, gliding, cluster reduction
	Rating	0	1	

7c Evidence of influencing factors: general comments on child's speech and language, hearing etc.

8 Perceived Need

Speech and Language Therapy required for cleft speech problems at some point	Yes	No
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Intelligibility

- Ability of unfamiliar listener to understand speech
- Short sample of conversational speech at the start of the speech sample

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Date of Birth:	Age:	Centre:	
Male/Female	First Language:	Therapist:	
Type of Cleft/Structure:			
Background information (e.g. current URTI, Voice disorder)			

Insufficient speech sample to audit the case: 8

1 Intelligibility/Distinctiveness of speech

Rating	Description
0	Normal.
1	Different from other children's speech, but not enough to cause comment.
2	Different enough to provoke comment, but possible to understand most speech.
3	Only just intelligible to strangers.
4	Impossible to understand.



Voice disorder

- Phonation arising from the vibration of the vocal folds
- Secondary or separate from the cleft condition
- Soft voice syndrome/ hoarseness & breathiness/vocal fatigue/dysphonia/nodule and MTD

2 Voice

Rating	Voice Characteristics
0	Absent
1	Distinctive or abnormal voice quality



resonance

- Hyper nasality: abnormal increase in nasal resonance, most easily perceived on vowels and voiced consonants
- Hyponasality: abnormal reduction or absense in nasal resonance, most easily perceived on nasal consonants

3 Resonance

3 a Hypernasality

Rating	Description
0	Absent
1	Borderline - minimal
2	Mild - evident on close vowels e.g. <u>zoo</u> , <u>three</u> , <u>six</u> / \tilde{u} , \tilde{i} , $\tilde{ɪ}$ /
3	Moderate - evident on open and close vowels
4	Severe - evident on vowels and voiced consonants

8

3 b Hyponasality

Rating	Description
0	Absent
1	Mild - partial denasalization of nasal consonants and adjacent vowels
2	Marked - denasalization of nasal consonants / \tilde{m} , \tilde{n} , $\tilde{\eta}$ / and adjacent vowels

8



Nasal airflow

- Abnormal or inappropriate escape of air through the nasal cavity accompanying the production of voiced and voiceless oral pressure consonants
 - Exclude nasal fricative (substitute to consonants)
- breathy voiceless nasal e.g. [m̥ n̥ ŋ̥] more turbulent sound [m̥̥ n̥̥ ŋ̥̥]
- Nasal turbulence: turbulent noise accompanying production of oral pressure consonants and nasal consonants

more turbulent sound 

- Nasal turbulence: turbulent noise accompanying production of oral pressure consonants and nasal consonants

4 Nasal Airflow

4a Audible Nasal Emission	
Rating	Description
0	Absent on pressure consonants
1	Occasionally heard on pressure consonants < 3 examples on different sounds
2	Frequently heard on pressure consonants ≥ 3 examples on different sounds

8

4b Nasal Turbulence	
Rating	Description
0	Absent on pressure consonants
1	Occasionally heard on pressure consonants < 3 examples on different sounds
2	Frequently heard on pressure consonants ≥ 3 examples on different sounds

8



Facial grimace

- Nasal flare, nasal grimace, facial grimace occurring during speech which is sufficient to distract listeners



5 Grimace

Rating	Grimace
0	Absent
1	Grimace behavior – sufficient to distract the listener



Consonant production errors

- Atypical production of consonants in sentences and spontaneous speech
- Circle the correct phoneme in the center box

imitation

(I)

nose holding

(nh)

6 Consonant Production

6a Consonant Production

Realization	Labial			Dental			Alveolar						Post Alveolar			Velar			Glottal	S clusters
Initial Realization																				
Correct Target	m	p	b	f	v	ð	n	l	t	d	s	z	ʃ	tʃ	ʤ	ŋ	k	g	h	st skr sl
Final Realization																				

6 b Observations of spontaneous speech: note any distinctive characteristics in spontaneous speech/sound imitation

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traffic light system devised by
Harland (1996)

- ◉ to facilitate the interpretation of the results
- ◉ **Green** indicates absence of these features, a satisfactory result with no intervention needed
- ◉ **yellow** indicates occasional or mild occurrence of these features, there would be a need to monitor progress because there may be a requirement for some intervention, either surgical or speech therapy(depend also on the overall profile gained across all the sections)
- ◉ **red** indicates frequent and/or marked occurrence of features, an unsatisfactory result requiring further detailed speech assessment, structural investigations, and probable surgical intervention and/or speech therapy intervention.

TABLE 7 Color Coding Depicting Outcomes/Clinical Implications of the Outcome Ratings

Section	Dark Green	Light Green	Yellow	Red
Hypernasality	No action required		Consider structural investigations	Structural investigation required
Nasal airflow	No action required			Structural investigations required
CTCs*	No action required	Monitoring required	Speech therapy required	Speech therapy required
			Consider structural investigations	Structural investigations may be required

* CTC = cleft-type characteristic.

0		
0		
0		
0		
0		
0		
0		
14		
0		

7a	Cleft Type Characteristics (CTCs) Rate individual CTCs	Absent	≤ Two consonants affected	Three or more consonants affected
Anterior Oral CTCs				
1	Dentalization/ inter-dentalization e.g. [t̪] [t̪̥]	0		
2	Lateralization / lateral e.g. [ls] [ɬ]	0		
3	Palatalization / palatal e.g. [tʲ] [tʲ̥]	0		
Posterior Oral CTCs				
4	Double articulation e.g. [t͡k] [p͡k]	0		
5	Backed to velar/uvular e.g. /t d s n l/ => [k g x ŋ] [q ɢ ʁ N]	0		
Non-Oral CTCs				
6	Pharyngeal articulation e.g. [ħ ʕ]	0		
7	Glottal articulation e.g. [ʔ], [h ɦ]	0		
8	Active nasal fricatives e.g. [m̥] [n̥] [ŋ̥]	0		
9	Double articulation e.g. [b̥ʔ] [d̥ʔ]	0		
Passive CTCs				
10	Weak and or nasalized consonants e.g. [b̥, b̃, d̥, d̃]	0		
11	Nasal realization of plosives e.g. b => [m], d => [n], and/or suspected passive nasal fricative e.g. f => [(f)̃m], [(f)̃n] or s / ʃ => [(s)̃n̥] [(x)̃ŋ̥]	0		
12	Gliding of fricatives/ affricates / f v / => [w], /s z ʃ / => [j]	0		



7b/ 7c

- 7b: Speech errors require to monitor or intervention
- 7c: breath control/ rate of speech/ language difficulties suspected/ hearing difficulties suspected

7b	Non-cleft speech immaturities / errors	Absent	Present	Describe/ Transcribe examples
	Rating	0	1	e.g. fronting, stopping, gliding, cluster reduction

7 c Evidence of influencing factors: general comments on child's speech and language, hearing etc.



Perceived need

- Need speech therapy??!!



8 Perceived Need

Speech and Language Therapy required for cleft speech problems at some point

Yes

No

Hypernasality – Single Words 0 = Within normal limits 1 = Mild 2 = Moderate 3 = Severe X = Missing data	Hypernasality – Sentences 0 = Within normal limits 1 = Mild 2 = Moderate 3 = Severe X = Missing data
Hyponasality – Sentences 0 = Within normal limits/None 1 = Present X = Missing data	Voice Disorder – Whole Speech Sample 0 = Within normal limits/None 1 = Present X = Missing data
Audible Nasal Air Emission and/or Nasal Turbulence – Single Words 0 = Within normal limits/None 1 = Present [(√) the frequency] ___intermittent or variable ___frequent or pervasive X = Missing data	Audible Nasal Air Emission and/or Nasal Turbulence – Sentences 0 = Within normal limits/None 1 = Present [(√) the frequency] ___intermittent or variable ___frequent or pervasive X = Missing data
Consonant Production Errors – Single Words 0 = Within normal limits/None 1 = Present [(√) <u>all</u> that apply]: ___ abnormal backing of oral targets to post-uvular place ___to pharyngeal ___to glottal ___ abnormal backing of oral targets, but place remains oral ___to mid-dorsum palatal ___to velar ___to uvular ___ nasal fricative ___phoneme specific ___not phoneme specific ___ nasal consonant for oral pressure consonant ___ nasalized voiced pressure consonants ___ weak oral pressures ___ other oral misarticulations ___ developmental articulation/phonological error X= Missing data	Consonant Production Errors – Sentences 0 = Within normal limits/None 1 = Present [(√) <u>all</u> that apply]: ___ abnormal backing of oral targets to post-uvular place ___to pharyngeal ___to glottal ___ abnormal backing of oral targets, but place remains oral ___to mid-dorsum palatal ___to velar ___to uvular ___ nasal fricative ___phoneme specific ___not phoneme specific ___ nasal consonant for oral pressure consonant ___ nasalized voiced pressure consonants ___ weak oral pressures ___ other oral misarticulations ___ developmental articulation/phonological error X= Missing data
Speech Understandability – Conversational Speech (circle the rating that best applies)	Speech Acceptability – Whole Speech Sample (circle the rating that best applies)
0 = Within normal limits: Speech is always easy to understand 1 = Mild: Speech is occasionally hard to understand 2 = Moderate: Speech is often hard to understand 3 = Severe: Speech is hard to understand most or all of the time X = Missing data	0 = Within normal limits: Speech is normal 1 = Mild: Speech deviates from normal to a mild degree 2 = Moderate: Speech deviates from normal to a moderate degree 3 = Severe: Speech deviates from normal to a severe degree X = Missing data

