



Aided augmentative communication in managing children with cerebral palsy

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Abstract

The use of an aided augmentative communication system to achieve effective communication between the pediatric dentist and the child with cerebral palsy is described. This type of communication involves symbols placed on a communication board and may be used together with conventional behavior management techniques for successful delivery of dental treatment. A multidisciplinary team caring for the child is necessary to achieve successful outcomes. Aided augmentative communication is a promising adjunct for the care of the child with communication impairment, and may be of particular value in pediatric dental practices where the staff are able to practice and master its use for selected child patients. (Pediatr Dent 23:136-139, 2001)

In all areas of dentistry, communication plays an important role to help build a positive partnership between the dentist and the patient for successful delivery of treatment. It is particularly important in pediatric dentistry, as behavior management can only be achieved through effective communication between the pediatric dentist and the child patient. Communication through speech cannot always be achieved for the child patient with a severe communication impairment (also known as the "non-speaking" child).^{1,2} The child with cerebral palsy may fit into this category, as some cannot use speech to communicate.

Other means of communication besides speech that can be used in the practice of dentistry have seldom been mentioned in the pediatric dental literature. This article briefly presents the dental needs of the child with cerebral palsy and the use of an aided augmentative communication system that has been developed in the dental clinic of the Glenroy Specialist School, Victoria, Australia, in which most of the students have cerebral palsy.

Description of technique

The child with cerebral palsy

Cerebral palsy (CP) is defined as "a persistent, but not necessarily unchanging, disorder of movement and posture due to non-progressive disorder of the immature brain."³ It consists of a wide spectrum of conditions that have in common an early age of onset, a non-progressive motor disorder, and problems in management, therapeutic, and educational needs. It is one of the most common physically disabling conditions in children, with a prevalence in industrialized countries of 2 in 1,000

live births.^{4,5} Males are affected more commonly than females, and mental retardation is present in 40% of cases.⁵

Children with CP are often misinterpreted as mentally disabled due to the presence of primitive postural reactions or reflexes and speech defects.³ Although most children with spastic quadriplegia have severe mental disability, the intelligence of children with other types of CP may be within normal range, as found in most children with athetoid (dyskinetic) CP, and some with spastic hemiplegia and diplegia.³ These children may fully understand speech, but often have difficulty in producing speech due to abnormal movements of the tongue and vocal cords. Other children with CP may also have hearing impairment. To help these non-speaking children communicate with others, non-speech language and communication aids have been developed.^{3,5}

Particular dental problems may occur in the child patient with CP. These include difficulty in maintaining good oral hygiene, gingival inflammation, high prevalence of caries, clenching and bruxism habits leading to attrition, gastroesophageal reflux causing erosion, enamel hypoplasia, high prevalence of trauma to anterior teeth, salivary dribbling and drooling, and malocclusion.⁵⁻⁸

Despite demonstrated needs for dental treatment in individuals with disabilities, previous studies have noted that preventive and restorative treatment needs are frequently unmet in such individuals.^{6,9,10} The barriers to seeking dental care by patients with CP have been described, with the main problems being fears and negative attitudes towards dentistry which may be attributed frequently to a lack of communication between the dentist and the patient.¹¹

Dental management of the patient with CP should be done through a multidisciplinary approach when possible.^{2,3,12} This may involve the family or caretaker, physician (pediatrician or pediatric neurologist), physiotherapist, speech pathologist, psychologist, teacher, ophthalmologist, audiologist, ear, nose, and throat surgeon, orthopedic surgeon, social worker, etc, depending on other medical conditions and special needs of the patient. Participation in such a team will help the dentist understand the child's physical abilities, intellectual capabilities, and educational status.² These factors will further influence planning the appropriate treatment for the patient.

Aided augmentative communication in the dental setting

To facilitate communication for non-speakers, augmentative communication has been developed. Augmentative commu-

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Fig 1. Clinical use of the COMPIC system on a communication board with a patient seated on a wheelchair.

nication is defined as any communication that supplements spoken words or sounds in non-speaking people.^{1,2} Augmentative communication is classified into two categories: unaided and aided. Unaided communication requires no additional equipment as it involves movements of the hand and arms, facial expression, and use of the body in gestures, familiarly known as sign language.^{12,13} An aided augmentative communication system requires external devices such as symbolic systems placed on a suitable support (an aid). Symbol systems can be in the form of objects, photographs, pictures, pictographs, symbols, words, or the letters of the alphabet. The communication supports can be boards, books, wallets, or electronic equipment.^{1,13}

The use of aided augmentative communication in dentistry for the non-speaking child has been rarely mentioned in dental publications. The use of a communication board and Picture Communication Symbols¹⁴ for children with CP, multihandicaps, mental disability, and autism has been suggested previously.² More recent reports record the use of pictures and social stories in children with autism and Asperger syndrome to introduce dental procedures.^{15,16} The advice of a multidisciplinary team once again is needed in choosing the appropriate aided augmentative communication for the patient.

The Glenroy Specialist School, located in Glenroy, Victoria, Australia, is a school for children with major physical, sensory, and health disabilities. It has 107 students aged between 5 and 18 years. Most students have multiple disabilities, with CP as the most common medical condition. A multidisciplinary team is available at the school, consisting of qualified teachers in special education, such as a speech pathologist, physiotherapist, pediatric neurologist, psychologist, pediatric dentist and nurses.

At this school, various types of aided augmentative communication are introduced to the children. Using real or miniature objects requires less cognitive ability than many other systems, but has a limited range of messages and is difficult to transport and access.¹⁷ Photographs of real objects, people, or events are easily recognized and highly motivating, although they have a limited range of messages and do not allow the child to learn language structures.¹⁷ Electronic aids are also available which may have a human voice quality, "type to speech" output, and built-in printers. However, they are sometimes impractical

because they may not be portable, require long periods of training, and are costly.¹⁷

The COMPIC system

The use of the Computer Pictographs for Communication (COMPIC) system (© Spastic Society of Victoria, Ltd;) with a communication board has been suggested for the dental setting.¹⁸

The COMPIC system is based on an international symbol convention.¹⁷ Each symbol represents an object, word, or idea, which has been computerized and standardized by speech pathologists in Victoria, Australia. Approximately 1,200 pictographs are stored on computer discs.¹⁶ Successful use of the COMPIC system by an individual requires the ability to discriminate between pictographs, the cognitive ability to understand that the pictographs represent a specific word or object, the ability to connect symbols into long sequences, and a communication support.¹⁷ Advantages of this system include the ability for the symbols to be: stored in a computer, portability of the communication support, and ease of understanding (the words are written beside the symbol).¹⁷ The COMPIC system appeals particularly to adolescent and adult users. However, there are some disadvantages with this system, such as difficulty in interpreting a long sequence, difficulty in distinguishing between similar pictographs, and the need for visual discrimination.¹⁷

The use of COMPIC in pediatric dentistry

The communication board and pictographs can be used clinically with the patient in either a seated or supine position,² such as sitting on the dental chair or on their own wheelchair (Fig 1). The symbols are simple black and white line drawings printed on a card and laminated. Through the use of a hook and loop fastener (VELCRO®), the symbols are easily placed and removed from a piece of carpetboard (Fig 1).¹⁷ The patient must be able to see and point to the symbols with their hand, eye-gaze, facial expression, gesture, movement, pointer, or light.^{2,17} Prior to use in the clinical setting, the patient must already have had practice and training, provided by members of the team such as the speech pathologist, classroom teachers, and parents at home.^{2,17} The dentist and dental assistant must practice the use of COMPIC in the dental clinic, and this will

 who	 why	 the	 and	 with
 do	 O.K.	 good	 tired	 lonely
 put	 uncomfortable	 angry	 afraid	 excited
 out	 bored	 worried	 more	 sick
 people	 cold	 hot	 broken	 part of my body

Fig 2. Example of familiar COMPIC symbols that can be used to facilitate communication with a child.

* COMPIC, A Division of The Spastic Society of Victoria, Australia, 1992. Reprinted by permission. For further information, contact: COMPIC, PO Box 1233, Camberwell 3124, Victoria, Australia. E-mail: compic@bigpond.com. Web: www.compic.com. Phone: + 61-3-9553-6182, Fax: +61-3-9553-6183.

† COMPIC symbols modified by speech pathologists at the Glenroy Specialist School.

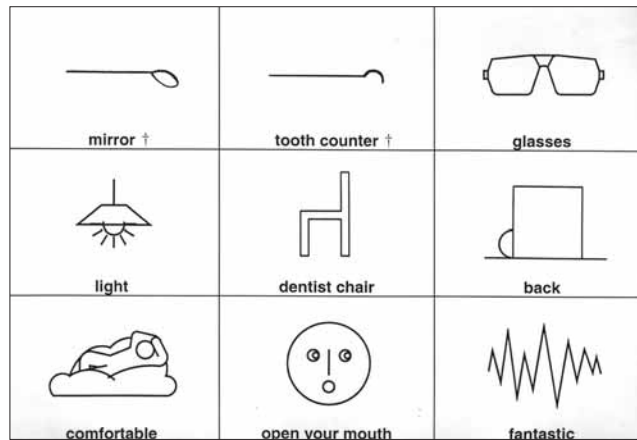


Fig 3. The sequence of introducing the dental examination with COMPIC symbols and communication board.

often need several visits with repetition as the patient may forget in subsequent visits. Parents are asked to practice using the dental symbols with the child prior to the dental visit.

This type of augmentative communication can be used in conjunction with traditional behavioral management techniques that are recommended for children, in order to supplement communicative management. Communicative management is one of the basic foundations for behavior management,¹⁹ and can be performed with various everyday symbols that are familiar to the child (Fig 2). Introduction of instruments and procedures is accomplished with “tell-show-do,” in which the symbols are presented together with the object for familiarization, for example the use of the dental mirror and probe. This should be done repeatedly, until the child shows understanding that the symbols represent a certain object. The child’s understanding may be tested by showing an object then asking the child to point to the correct symbol or vice versa. Every desirable response to treatment or behavior should be rewarded with positive reinforcement; verbal praise is given together with presentation of a positive symbol, such as the “fantastic” symbol (Fig 3), for example, in preparing the child for the dental examination. The symbols are placed on the communication board, and the child is able to directly see the symbols. All the instruments and procedures to be used are introduced with the corresponding symbols, such as the dental mirror, probe, light, eyeglasses, moving the dental chair backwards and forwards, and opening the mouth (Fig 3). The child is asked whether he/she is comfortable and understands the instruments and procedures to be done, then the patient is requested to open his/her mouth. The child should be praised for every successful task.

When using the COMPIC system it is important to speak slowly, to repeat frequently, to model responses for the child to help them imitate, to give opportunities for the child to express choices, and to include as many people as possible in familiarizing the child with the symbols.²⁰ These steps are essential for successful use of the COMPIC system.

Discussion

The aided augmentative communication system can provide an alternative to speech in the patient with CP who is unable to speak. Communication will help build a positive relationship between the dentist and patient, facilitate understanding,

and enable active participation by the child, thereby modifying behavior to enhance successful dental treatment. Coordination with team members working daily with the child in the school is important, as they can give suggestions to establish and improve communication.

Although aided augmentative communication is promising, it may still be challenging to implement in a private dental practice. Frequent practice visits and training, repetition, and patience are required for the pediatric dentist and his/her staff to ensure successful outcomes. However, pediatric dentists will find it both professionally and personally rewarding, as their efforts help these children to become active participants in society.

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ABSTRACT OF THE SCIENTIFIC LITERATURE



INTRA-ORAL DISTRIBUTION OF DENTAL FLUOROSIS

Although dental fluorosis is symmetrically distributed the prevalence and severity of lesions varies among different types of teeth. This study examined the intraoral distribution of fluorosis in a fluoridated and non-fluoridated community. The intraoral distribution of Dean's index scores and the effect of fluoride exposure on early- and late-forming teeth were determined by examining 2,193 lifelong residents, ages 7-13 years, of fluoridated and non-fluoridated communities. The authors also performed logistical regression analysis to determine the effects of fluoridation, early brushing, daily supplements and other variables on early-forming and late-forming teeth. The results show that the occurrence of very mild or greater levels of fluorosis in the upper anterior teeth was 7 to 10% in the fluoridated area and 5 to 9% in the non-fluoridated area. Less than 1% of the study population had moderate or severe fluorosis. In the fluoridated area the occurrence of fluorosis increased from anterior to posterior teeth. Both late-forming and early-forming teeth were affected by exposure to fluoridation, daily fluoride supplement use and brushing before the age of two years. Their analysis showed that the esthetic consequences of exposure to multiple sources of fluoride was less dramatic, as evidenced by the lower frequency of fluorosis in anterior teeth than posterior teeth.

Comments: This paper is worth a careful examination by all pediatric dental practitioners as it addresses the ongoing concerns regarding current fluoride exposure and fluorosis. The low occurrence of even very mild fluorosis in these populations and its even lower occurrence in esthetically sensitive areas of the mouth suggests the social impact of fluorosis in these populations is quite low. CH

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Intra-oral distribution of dental fluorosis in Newburgh and Kingston, New York. Kumar J, Swango P, Haley V. and Green E. *J Dent Res* 79 (7): 1508-1513. 2000.