

WESTER REGIONAL EARLY INTERVENTION
CONFERENCE 2015

Traditions and Innovations:
Serving Families Today and Tomorrow

**Teaming Up:
Sign Language and Cochlear Implants**

Karla Jael Sánchez, MA

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Agenda

- Objective
- Background framework
- Brief history review about Cochlear Implants
- Factors impacting post-implant development
- Research in different countries
- Expert opinions
- Conclusion

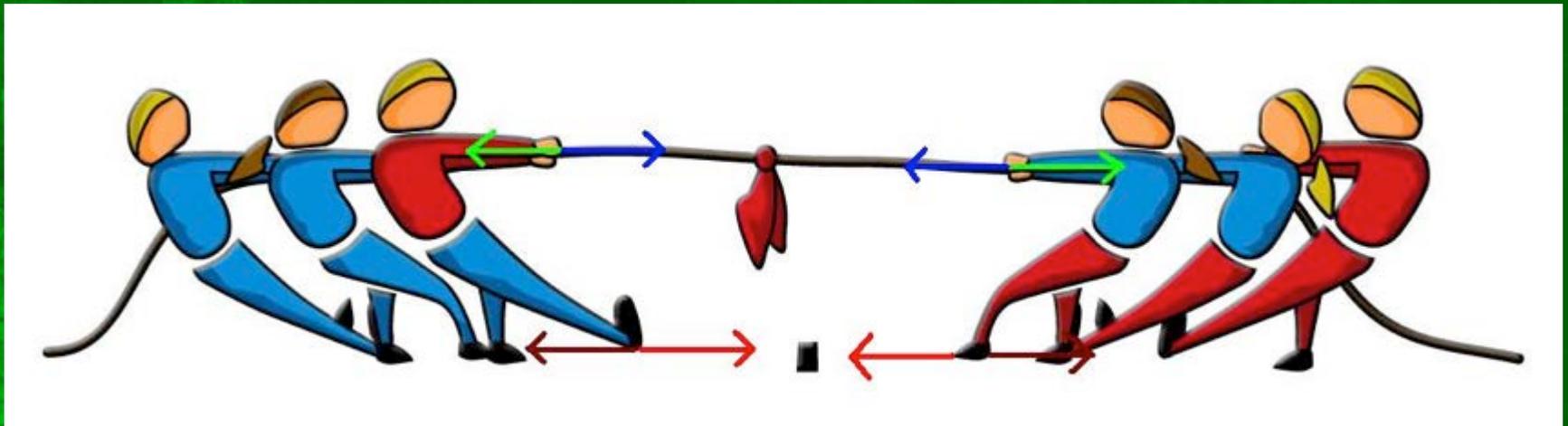
Objective

- Not to discuss if Cochlear Implants (CI) are good or bad. The fact is that there is an increasing heterogeneous population getting CI.
- The objective is to reflect on:
 - How can we provide optimal services and orientation to address the diverse needs of families and kids, when deciding, before, and after getting the CI.

Background framework

The use of Sign Language by individuals with different degrees of auditory access born into hearing families, has been controversial far before the common use of CI.

Deaf education around the world has been a battlefield between the oral exclusive proponents and the bilingual approaches.

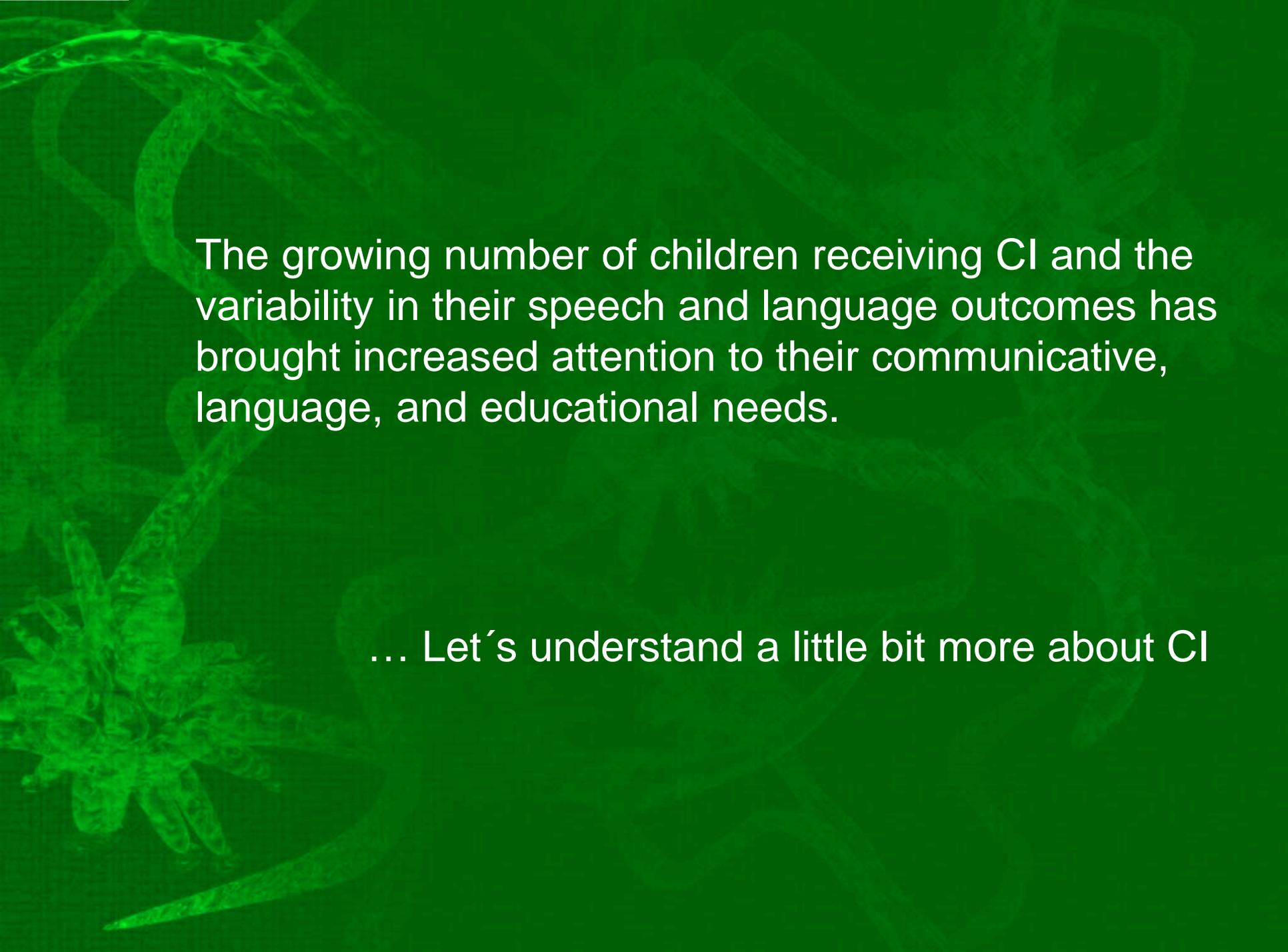


To this already divided field, **Cochlear Implants** arrived.

Background framework

Medical Community	Bilingual Approach
<p>Emphasis on the exclusive use of spoken language before and following implantation prevails.</p> <p>Sign language is seen as an obstacle to spoken language development.</p>	<p>Aims to develop social and academic language proficiency in both languages (American Sign Language & English).</p> <p>Bilingual programs vary (strategies, methodology, value to each language).</p> <p>Some programs provide space for oral/aural development for children with CI in addition to Sign Language.</p>

(Gárate, 2011)



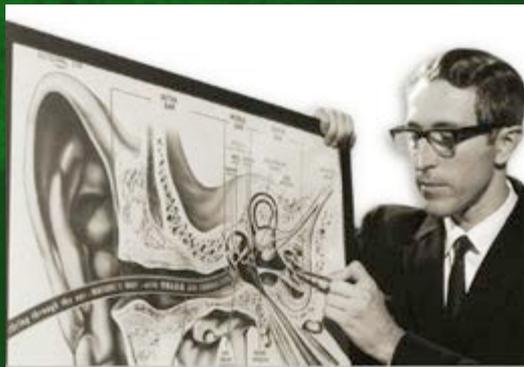
The growing number of children receiving CI and the variability in their speech and language outcomes has brought increased attention to their communicative, language, and educational needs.

... Let's understand a little bit more about CI

Brief history of Cochlear Implants

- Graeme Clark begins researching the possibilities of an electric implantable hearing device

1967
Australia



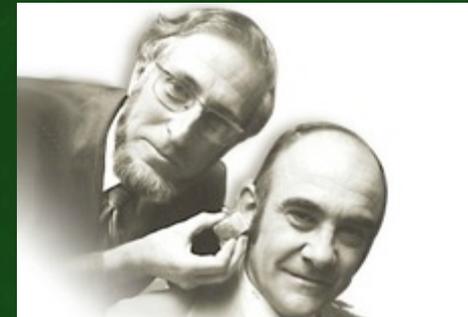
1977,
Sweden

- Mona Andersson, first recipient of the BAHA bone conduction implant (postlinguistic)



- Rod Saunders, first CI recipient to show the benefit of multi-channel stimulation (postlinguistic adult)

1978



Brief history of Cochlear Implants

- Second CI recipient with portable voice processor

1980

1981,
Australia

- Paul Traylor develops multi-channel CI

- Graham Carrick, 37 years old, first commercial CI recipient
- First wearable sound processor

1982



Brief history of Cochlear Implants



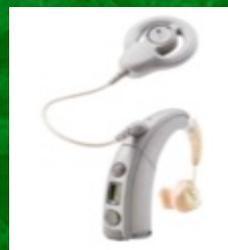
Brief history of Cochlear Implants

Company is in the Australian stock market

1998, CI could report neural responses.
*Behind the ear speech processor (BTH)



Product Innovations, improved speech coding, loud & soft environmental sounds balance, hybrid (CI + HA), wireless connection to phone, mp3, water resistant sound processor



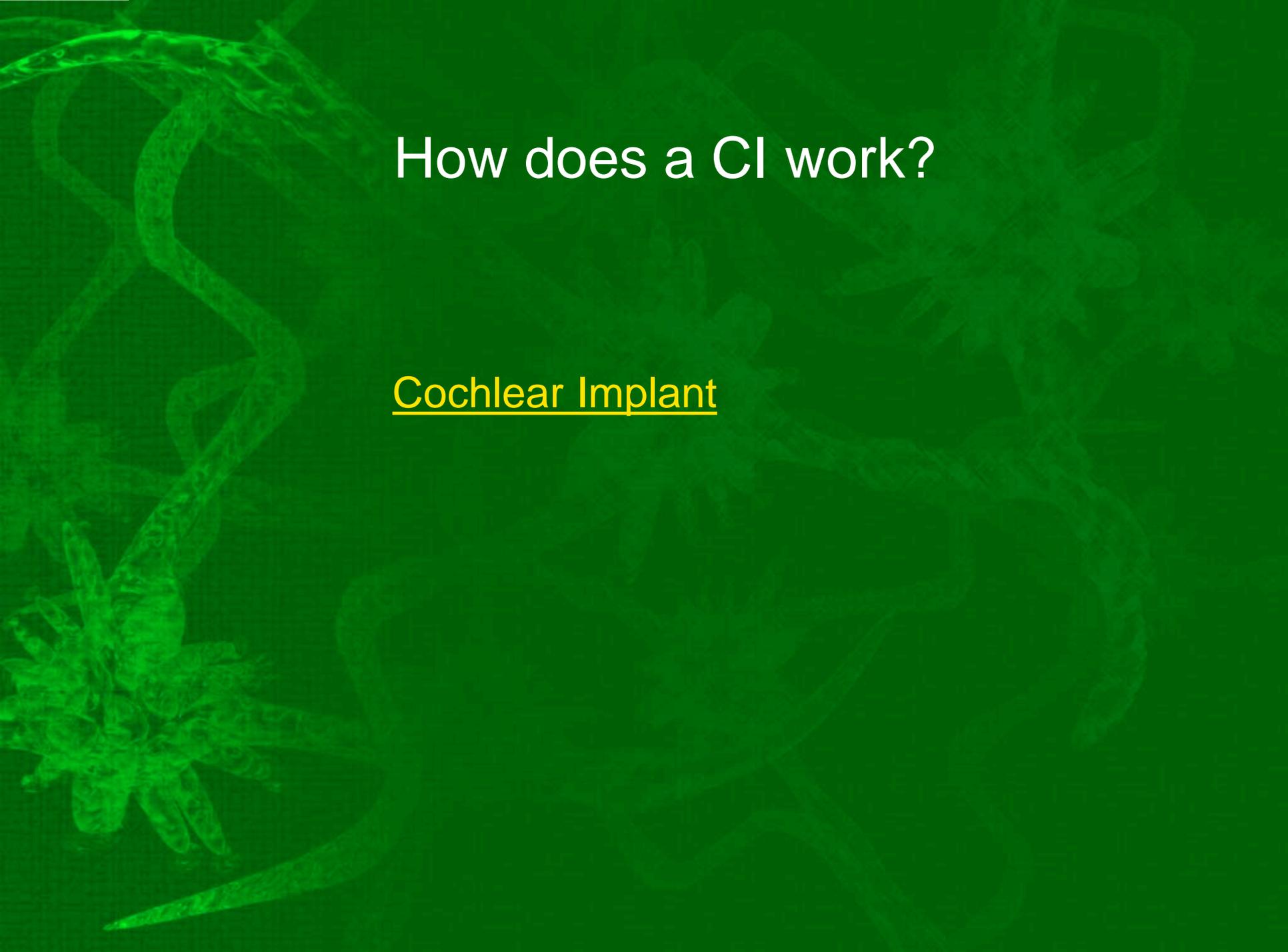
2000, FDA approved surgery in babies 12 months old. A little later bilateral implantation started.



2012, 324,200 CI world level. USA: 58,000 in adults & 38,000 in kids

CI have been successfully used for Aud. Neuropathy. Considering future use just in some part of the cochlea.





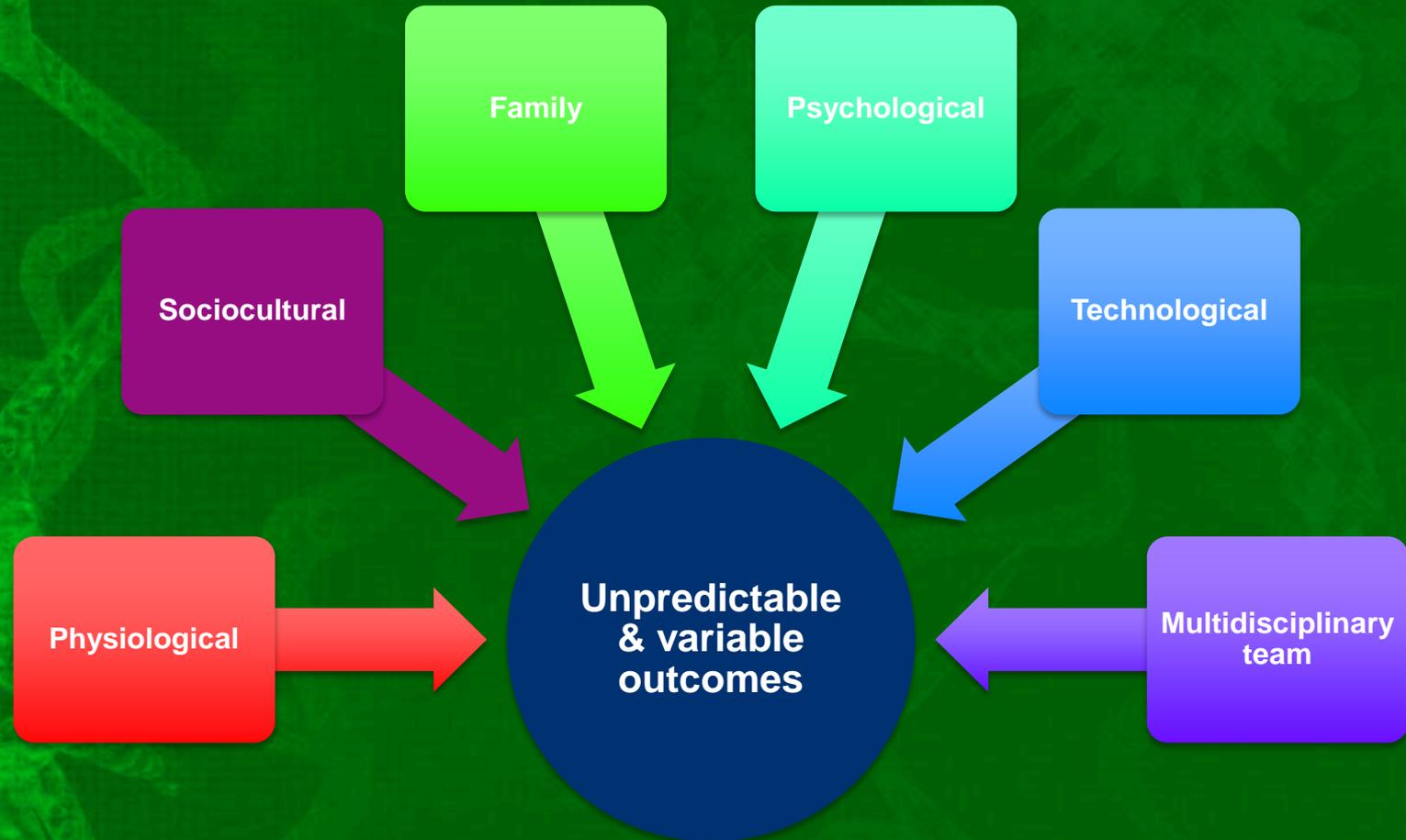
How does a CI work?

Cochlear Implant

What the CI does NOT do

- Does not “cure” deafness, it sends an electric representation of the sounds to the brain
- CI recipients do not hear all of a sudden. They require significant auditory training to learn how to interpret the sounds they hear. *(National Institute on Deafness and Other Communication Disorders)*
- CI recipients do not start talking right after surgery. They require significant oral training to learn to use speech.
- CI are not one size fits all, recipients do not benefit in the same way.
- It does not guarantee a successful surgery.

Variety of factors impact post-implant development



In reality

- There are successful stories
- There are stories where all the factors involved do not synchronize harmonically

Due to the fact that the population of implanted children is so highly heterogeneous, a variety of communication approaches is needed to address, on an individualized basis, the diverse needs of these children.

Therefore,

since the outcomes are so unpredictable; there's been research done in different countries, devoted to understand if the use of

Sign Language,

provides CI recipients the opportunity to achieve their full potential, thus having an appropriate linguistic, cognitive, communicative, and social development.

What do research findings show?

Research reports from different countries regarding the use of Sign Language with CI provided valuable information.

This information was classified into 6 areas.

Research Findings – 6 Areas

Language development

Cognitive development

Communicative competence, personal & social development

Bilingualism

Speech

Parental expectations & report

Research Findings

Language Development



Early language exposure is paramount to language development.

(Mayberry, 2007)



The **best possible** language environment for CI recipients, will optimize the child's speech, language, and psychosocial development

(Dammeyer, 2009)



“Strong language abilities are essential to the success of every implanted child”

(Robbins, 2002)

Language Development

Since it is imperative to promote the language proficiency in children pre-implant & post-implant it is important to offer multiple opportunities for linguistic access through different pathways.

Cummins quoting Goldin-Meadow and Mayberry highlights the importance of acquiring a strong first language in the early years of life. **“Deaf individual who acquire scant language (in sign or speech) during childhood never catch up in adulthood and do not attain native-like proficiency in any language”**



(Cummins, 2006)

Research Findings

Language Development



France, 2002. Even for kids with CI who develop all the oral possibilities, the time that goes by between implantation and phonological acquisitions is, in average, at least one year. Amount of time which is impossible to shorten because of the neural epigenesis (neural and synapses development). If there is no language comprehension during this time, cognitive & social development will be affected.

“The years prior to implantation and the first year after receiving the implant; the CI does not provide the deaf child the necessary conditions to normally develop language. Therefore, once again, we face the language deficit problem, with negative dramatic developmental effects.

(Virole, 2002)

“The early use of sign language continues to be of fundamental importance for the majority of implanted deaf kids”

(Virole, 2002)

Research Findings

Cognitive Development

If we do not provide the minimal necessary conditions for a kid with CI to develop a symbolic representation of reality, we are hampering his cognitive development.

Germany, 2006 “If kids with CI develop language in a very slow pace, their thinking skills and intelligence are at risk of suffering negative effects. A way to prevent this is the use of sign language... Mental development does not mind if the symbols of the linguistic system are sounds or signs.”

(Szagun, 2006)

“ASL is a tool for thinking, problem-solving, and enabling children to form relationships with other people and the world of ideas”.

(Cummins, 2006)



Research Findings

Cognitive Development



Koch (2000) suggests that signs may be critical to the development of a symbolic code that allows children to create linguistic neural networks to organize, store and retrieve concepts. ... With every deaf child prior to implantation, the use of signs will establish such a network of concepts. Once hearing is established through a cochlear implant, rehabilitation and listening experience allows these concepts to be transferred gradually to an auditorially-based system, i.e., spoken language. Clinicians hypothesize that this implementation of signing disambiguates language and prevents a wide cognitive-linguistic gap from forming”.

(Koch, 2000)

Research Findings

Communicative competence,
personal & social development

Any delay in language acquisition, not only has negative effects on cognitive development and school success, but also in the child's mental and emotional health.

Germany, 2006; studied CI recipients who after three years from the surgery still had not developed speech adequately, the joy resulting from communicating diminishes gradually.

“Communication turns to be unsatisfactory and traumatizing for kids and their parents”

(Szagun, 2006)



Research Findings

Communicative competence,
personal & social development



“Developing a strong first language foundation in the early years is important not just for the child’s cognitive growth but also as a passport to membership in a social community that affirms the child’s intelligence and identity”

(Cummins, 2006)



“Many respected clinicians support the use of signs as a component of communication with implanted children”

(Robbins, 2002)

Research Findings

Bilingualism

Using sign language with CI recipients does not limit their potential for auditory development and speech production.



“Kids with CI have nothing to lose from being bilingual: they only win. If speech develops adequately they will choose to use spoken language. On the other hand, if they do not have progress in spoken language, thanks to sign language, they already have a rich and adequate symbolic system and their mental development takes place without disturbances”

(Szagun, 2006)

Bilingualism



“Being bilingual is a desirable quality that results in, but is not limited to, mental flexibility, creative thinking, and concept development. Deaf children can and do become bilingual in ASL and English in its spoken and / or written form”

(Gárate, 2011)

Speech

There is no scientific evidence proving that the use of sign language interferes with speech development.

(Szagun, 2006; Cummins, 2006; Yoshinaga-Itano, 2008; Baker, 2011; Gárate, 2011; Skowronek, 2011)

Research findings prove positive speech development when there is a previous linguistic foundation in sign language.

(Szagun, 2006; Nussbaum, 2004; Cummins, 2006; Yoshinaga-Itano, 2008; Baker, 2011)

Research Findings

Speech



A study observing speech abilities among CI recipients, found that “children who were educated using both sign language and oral communication, achieved significantly higher receptive spoken vocabulary scores when compared to children who were educated using solely oral communication.

(Connor, Hieber, Arts, and Zwolan, 2000)

Research Findings

Speech



Great Britain (2000), a study compared CI recipients divided into two groups. Based on parent report of pre-implant mode of communication: sign language or oral communication. Speech performance was not found significantly different among the groups assessed at three-, four- and five-years post-implant.

(Archbold, et al., 2000)

Research Findings

Speech

The cases in which auditory stimulation was combined with the use of sign language prior to the surgery, once implanted, the kids had an accelerated oral production.

The cochlear implanted children figured out that the sounds they could hear with their CIs were just another code for the signed vocabulary they already used for communication.

(Yoshinaga-Itano, 2008)



Research Findings

Parental expectations & report

Parental expectations are of very high value among the factors impacting speech & language development.



Dammeyer (2009) suggests that “parents should choose the pre-implant mode of communication they are more comfortable and proficient with. Children develop speech and language by receiving exposure to it in their environment. Therefore, it is important that parents provide complete and meaningful language models to their child prior to cochlear implantation. Encouraging parents to choose the pre-implant communication mode they are most proficient with, will ensure they provide their child with the best possible language environment”.

Research Findings

Parental expectations & report

This study reports: “at the beginning it is frustrating. It requires a lot of work in the first year. So of course satisfaction is low during that time. Given more time, satisfaction increases”.

The study didn't find 100% satisfaction.

There were some parents who felt they were not satisfied because the CI center did not do a good job of warning them or helping them lower their expectations... as a result they become depressed.



Research Findings

Parental expectations & report

Parents were asked: ***Why they had their child implanted?***

- 25% said for safety reasons (environmental awareness)
- 52% wanted their child to potentially develop spoken language
- Many parents wanted more options for their child in the future

Parents who were satisfied with the CI, said that; *“pre-implant, the children were more introverted and quiet; they didn’t participate in family discussions, they didn’t participate in group play, they were isolated. With the implant they started participating more”*.

Most of the parents admitted if they had to do it over again, they would implant their child younger because then they felt their child would have better options and better potential.



Research Findings

Parental expectations & report



“Parents’ decision regarding pre-implant communication mode is not always a permanent decision”

(Watson, Archbold, Nikolopoulos, 2006)

Parents and team members should keep a watchful eye on how well the chosen methodology works for a given child. If progress is not occurring or there are new skills being acquired, the strategies used need to be flexible to evolve with the child’s progress.

Expert opinions



The National Association of the Deaf (NAD) has said that parents should encourage all uses of technology that will help the deaf child, including cochlear implants. And at the same time, parents must pay attention to the whole child.

(CI and SL: Putting it all together, April, 2002, Conference Proceedings)

Expert opinion



The main objective should be the use of all the tools that can increase the quality of life for kids with CI, as well as the family's well being.

(Government of Spain, 2011)

Expert Opinions

“Technology can be of great help to improve deaf people’s quality of life as long as it is an addition, not a substitute. As long as the right to use sign language is respected and encouraged as the primary means for knowledge access. CI recipients need to receive the message that their family does not reject them or wants to transform them into hearing persons. They need to feel they are respected and have the opportunity to enjoy the benefits of technology without ignoring their own identity”.



(Hidalgo, 2010)

Expert Opinions



Chronologic age

0 6 months 1 year old 2 years old 3 years old

Birth

Hearing status
identified

CI surgery

1 year of neural
epigenesis. No
fluent language

Oral Lang.
starts to
develop

Red flags to see if oral
language is not
developing

Period of life with no full language access, affecting cognitive, social and personal development.

Expert Opinions



Chronologic age

0 6 months 1 year old 2 years old 3 years old

Birth

Hearing status identified

CI surgery

1 year of neural epigenesis. No fluent language

Oral Lang. starts to develop

Red flags to see if oral language is not developing

Language development using Sign Language

Age appropriate cognitive, social, and personal development

Conclusion

- Just as a PE class for High School students will certainly use different methodologies and strategies to reach its objectives from a 1st grade Math class, we need to clearly understand what are we working on.

Language	Listening & Speech skills
<p>The use of sign language is supported by the fact that linguistic development does not care for the access mode. The goal is to develop language, not the use of a non-fully efficient channel.</p> <p><i>(Virole, 2002; Baker, 2011)</i></p>	<p>Auditory / oral methodologies</p>

Conclusion

“Noticeable changes in communication should be seen after three months of implant use. On average, children wearing multi-channel implants make one year of language progress in one year’s time.” *(Robins, 2002)*

- All communication methodologies should constantly assess language, speech, and cognitive development to
 - * monitor for appropriate progress in all areas
 - * support new skills gained
 - * see the child as a whole

Conclusion

- The Deaf Community has diverse types of D/deaf people
- There are many different ways to be D/deaf
- People with cochlear implants represent another way to be D/deaf
- The growing number of children receiving cochlear implants requires professionals, early interventionists, educators, and parents to be well informed and unbiasedly knowledgeable to provide the best opportunities the children can have.

Conclusion

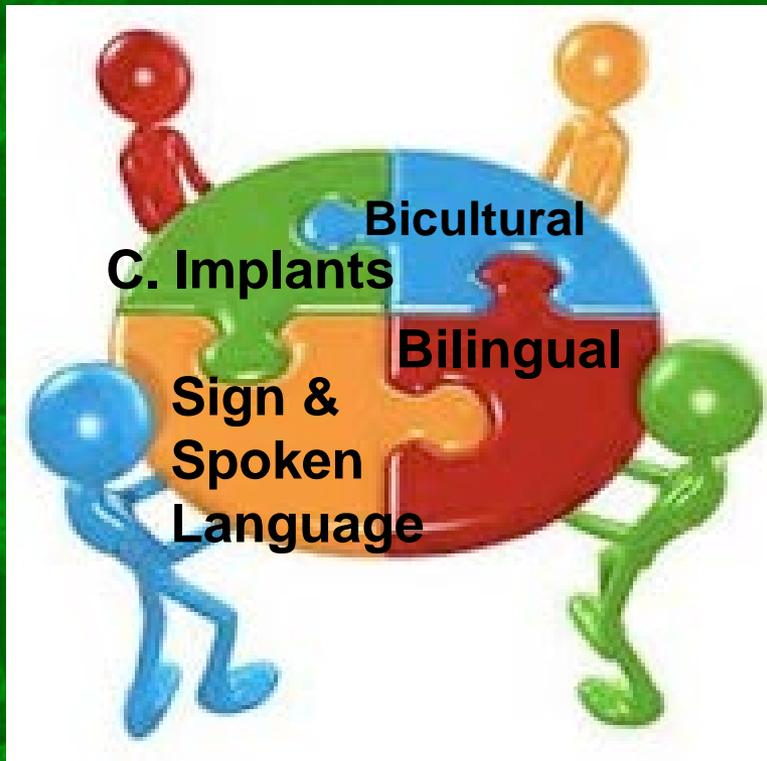
- Given the diversity in the characteristics of children and their circumstances, it is unlikely that any single approach will be able to meet the broad spectrum of children's learning needs. Hence, the need to provide individualized approaches to meet the specific needs of children and families.
- Our beliefs, attention strategies, and educational methods need to evolve in response to new technologies, early identified children, early and bilateral implantation, and individual family preferences.

Conclusion

- In order to fully enjoy the benefits of technology, Cochlear Implants should be added to the opportunities that individuals with different degrees of auditory access have. It should not be an excuse to reduce the opportunities and rights they have already gained.

Conclusion

- Technology should be an added opportunity not an obstacle



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Questions?



Thank You