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<tr>
<td><strong>Publication Date</strong></td>
<td>2011-06</td>
</tr>
<tr>
<td><strong>Publisher</strong></td>
<td>American Speech-Language-Hearing Association</td>
</tr>
<tr>
<td><strong>Link to publisher's version</strong></td>
<td><a href="http://aja.pubs.asha.org/article.aspx?articleid=1767760">http://aja.pubs.asha.org/article.aspx?articleid=1767760</a></td>
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<td><strong>Item record</strong></td>
<td><a href="http://hdl.handle.net/10379/5726">http://hdl.handle.net/10379/5726</a></td>
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<tr>
<td><strong>DOI</strong></td>
<td><a href="http://dx.doi.org/10.1044/1059-0889(2011/10-0028)">http://dx.doi.org/10.1044/1059-0889(2011/10-0028)</a></td>
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Services for Children with (Central) Auditory Processing Disorders in the Republic of Ireland: current and future service provision

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Abstract

Purpose: An interdisciplinary research group was established to investigate current and future service provision for children with (Central) Auditory Processing Disorders (C)APD in the Republic of Ireland. The aim of phase one was to identify current awareness and knowledge of (C)APD among the relevant professionals in Ireland including level of service provision, if any, available for children with (C)APD. The aim of phase two was to explore the initial steps required to develop an integrated service for children presenting with (C)APD.

Method: A quantitative design was used in phase one and 520 surveys were distributed to speech and language therapists (SLTs), audiological scientists (ASs),
and educational psychologists (EPs). A qualitative participative design was used in phase two.

Results: There was a 53% response rate to the survey. The main findings from phase one were that all professional groups considered themselves to be inadequately informed and lacking in skills for (C)APD assessment or intervention. In phase two, ninety-eight participants with backgrounds in SLT, AS, EP and occupational therapy engaged in interdisciplinary discussions to identify the first steps required to develop a (C)APD service.

Conclusion: All professional groups considered that they were inadequately informed about (C)APD and the first steps required to develop services in Ireland include: the promotion and development of interdisciplinary teamwork and education, a need for additional resources, a clearer understanding of the definition of (C)APD, and evidence-based assessment and management of this condition.
Although (C)APD was first discussed as a condition by Jack Katz in the mid 1960s, there has been growing international evidence of (C)APD as a clinical entity in the past twenty years. This recognition is evident in the recent publication of the Clinical Practice Guidelines by the American Academy of Audiology (AAA, 2010). These guidelines provide evidence-based recommendations for the diagnosis, treatment and management of children and adults with (C)APD. The AAA (2010) states that (C)APD refers to difficulties in the perceptual processing of auditory information in the central nervous system and the neurobiological activity that underlies that processing.

There have been a number of studies that have investigated professionals’ preparation for assessment, diagnosis and management of (C)APD (Chermak, Silva, Nye, Hasbrouch & Musiek, 2007; Chermak, Traynham, Seikel & Musiek, 1998; Hind, 2006). In the United States (US), Chermak et al. (1998) investigated professional preparation for assessment and diagnosis of (C)APD among audiologists. The impetus for this research was that there had been advances in the understanding of the workings of the central auditory nervous system. There had also been advances in the technological tools that could be used in the assessment of the central auditory system. They surveyed 500 randomly selected audiologists from membership of the American Academy of Audiology (AAA). There was a 36% response rate. The results indicated that although more than 80% of the respondents had some academic training in central audition, central auditory processing, and the central auditory nervous system, 78% reported a satisfaction rating of ≤50% in the education they received in this area. In addition, only 41% reported that they provided assessment of the central auditory system. On a positive note, the respondents were using a broader range of
tests in the central auditory system test battery compared with previous research. However, they were not using measures that had documented efficiency. Nine years later, Chermak et al. (2007) conducted a further study to update their data, to examine in more detail audiological practices in the assessment, diagnosis and management of (C)APD, and to describe audiologists’ professional preparation in this area. There had been changes in the entry-level requirement for practicing audiologists to a doctoral level education qualification. The results of this study suggested that there was an improvement in the academic preparation of audiologists in (C)APD. However, they found little change in clinical preparation and the use of an efficient central auditory assessment battery.

In the United Kingdom (UK), Hind (2006) reported on a study that investigated the care pathway for children and adults with suspected or identified auditory processing disorder (APD). This research was conducted by the Steering Committee of APD UK that had been established by the British Society of Audiology (BSA) in 2003. An online survey of 757 practitioners in audiology and speech and language therapy was conducted, which investigated screening and referral routes, diagnosis and management of APD. There was an overall response rate of 46% and the key findings suggested that there was no clear pathway for the diagnosis and/or management of this condition in the UK. A small percentage (9.6%, n = 19 services) of the respondents provided a screening service for APD, and the majority of the screening was conducted by the audiology service. Eleven of the nineteen services that provided screening used more than one method of screening, e.g., audiological assessments, cognitive/processing tests, questionnaires and/or profiles (educational/medical). Overall the screening tool most frequently used was the Test
for Auditory Processing Disorders in Children (SCAN-C) (Keith, 2000). Hind (2006) had concerns about the appropriateness of using the SCAN-C in the UK. She argued that this test is linguistically loaded and was developed in the US and this may lead to problems with cultural bias. Chermak et al. (1998) also had some concerns that the SCAN-C may not be an efficient measure of (C)APD. Hind (2006) also reported that only eighteen services provided a diagnostic service for children, and of this number 74% were from audiology and 26% from speech and language therapy. More than 50% of the respondents rated themselves as being not very well informed about this condition. Of interest, Hind (2006) found that a minimal number of the respondents who reported that they diagnosed APD considered they were very well informed about the condition.

Service provision for children with speech, language, communication, hearing and listening needs differs from country to country (e.g., depending on the entry-level qualifications of professionals, governmental funding, structure and organization of services, and population size). The professionals who would be involved in the management of children with (C)APD in Ireland are speech and language therapists, audiological scientists and educational psychologists. An overview of roles, minimum education requirements, sites for delivery of services and employing agencies is presented in Table 1. While the results of the surveys in the UK and US are useful and may be generalizable to some extent in the Irish context, there are no data available on professional preparedness or services for (C)APD in Ireland. Given that (C)APD is now internationally recognized as a clinical entity, a group of interested professionals, comprising speech and language therapists and audiological scientists, established an interdisciplinary (C)APD working group in Ireland in October 2005.
The clinical experiences of these professionals suggested that a number of children who presented with speech, language and communication difficulties may in fact have had (C)APD, but due to a gap in service provision these children were not being identified or diagnosed. From this working group, a research group was established that was made up of academic and clinical speech and language therapists, audiological scientists and a psychologist. The overall aim of the research was to explore current and future clinical practices in the assessment and management of (C)APD in Ireland.

**Methodology**

The research was conducted in two phases. For clarity of reporting, each phase of the study is presented and discussed separately below. Ethical approval for the study was obtained through the Research Ethics Committee, NUI Galway.

**Phase One**

The overall aim of phase one of the study was to identify current services, if any, available for children with (C)APD in Ireland. The objectives of this phase were to:

1. Explore the current level of awareness and knowledge of relevant professionals in relation to (C)APD, its identification, assessment and treatment.
2. Investigate how and if (C)APD is currently assessed, diagnosed and treated in Ireland.
3. Explore which professionals are currently involved in assessment, diagnosis, and treatment of (C)APD.
4. Collect data to inform phase two of the study.
Recruitment strategy.

A purposive sampling strategy was used to ensure the most productive sample was selected to address the research question. From a review of the literature on (C)APD, the research team identified key professionals that are involved in the diagnosis of and intervention for this disorder (i.e. audiology professionals, speech and language therapists and educational psychologists). The eligibility criteria for inclusion in the study were:

1. Speech and language therapists working with children in the public health services.
2. Speech and language therapists working with children in the private services\(^1\).
3. Educational psychologists working with school-aged children in the public education service.
4. Audiological scientists who are employed by the public health service.

Survey development.

The research team designed a survey to collect data to address the aim of phase one. Surveys are useful in that they allow for a large sample size (Hicks, 2004) and they produce data that are amenable to quantification (Sapsford & Jupp, 1996). The survey used in this study was based on that designed by the APD UK Group (Hind, 2006), with permission. Some changes were made to make the survey more applicable to the

\(^1\) There is an Irish Association of Speech and Language Therapists in Private Practice in Ireland so it was possible to access contact details for these therapists. The research team was not aware of any audiological scientists in the private sector. The research team was not aware of a professional organization of educational psychologists through which surveys could be distributed to those working in private practice.
Irish context and to answer the specific research questions in this study. Hedge (2003) defined validity as the degree to which the measurement of the variable is the best reflection of the true value of that variable. The original UK survey had twenty questions that addressed care pathway issues from screening to referral route, through assessment and management. In the revised survey used in the current study, there were fourteen questions (see Table 2). Hicks (2004) argued that the validity of a survey can be enhanced when the questions are based on a thematic review of the key issues related to the topic. Given that the research questions in the current study mirrored those of Hind (2006), the research team considered that use of the UK survey was a suitable tool upon which to base the current survey. Given that there were no data available on services for children with (C)APD in Ireland, a combination of closed and open-ended and Likert-scale questions were included in the survey. Closed-ended questions were useful in allowing for comparability across participants and open-ended questions allowed for flexibility in the data collection process (Burns, 2000). The survey was piloted on a sample of six participants, two from each of the key stakeholder groups. These participants were asked for specific feedback on the survey itself, the letter that would accompany the survey and the time taken to complete the survey. Comments from the pilot study enhanced the clarity and acceptability of the survey.

**Distribution of surveys.**

The research team asked all of the Speech and Language Therapy (SLT) Managers in Ireland ($n = 79$) to identity the number of speech and language therapists in their service working with children. There was an 87% response rate and the managers reported that there were 404 therapists working with children in their services. This
number of surveys, with an accompanying letter of invitation, and instructions, were posted to the SLT Managers, who agreed to distribute this documentation to each of the SLTs in their department. The same pack was also forwarded to the private speech and language therapists listed on the private practice website. Speech and language therapists were requested to complete the survey once only (i.e. if they worked in both the public and private service, they were requested to complete one survey). All of the audiological scientists working in the public health service \((n = 16)\) were invited to participate in the study. Respondents who did not work with children were requested to return the questionnaire uncompleted. The respondents were requested to complete and return the survey anonymously using a pre-paid envelope provided by the research team. One member of the research team contacted the National Educational Psychological Service (NEPS) Manager to seek advice on the most efficient and effective strategy for including educational psychologists in the study \((n = 100)\). It was considered that making the survey available for completion online may increase the response rate. The NEPS respondents were invited to return the questionnaires electronically directly to a member of the research team.

In total, 520 surveys were distributed nationally to speech and language therapists, audiological scientists and educational psychologists working with children.

**Data analysis.**

The returned questionnaires were coded, entered, and analysed using Statistical Package for Social the Sciences (Version 11) yielding descriptive statistics of frequency counts and percentage responses. The data obtained from open-ended
questions were transcribed and coded into themes by the team of researchers and the frequency of these themes was reported.

**Results of phase one.**

The overall aim of phase one of the study was to identify current services available for children with (C)APD in Ireland. As illustrated in Table 3, the total response rate was 53% of whom 87% were speech and language therapists (n = 209), 9% were psychologists (n = 23) and 4% were audiological scientists (n = 9). The results are provided under the following headings: knowledge and awareness of (C)APD, provision of services for children with (C)APD, and first steps in establishing a service for these children.

**Knowledge and awareness of (C)APD.**

The majority of the participants (73%) considered themselves to be poorly or very poorly informed about (C)APD, with 27% considering themselves to be very well, well or adequately informed (see Figure 1).

A breakdown of each profession’s self-rating about how well informed they considered they were about (C)APD can be found in Figure 2. In general, the majority of participants in all disciplines considered themselves to be poorly or very poorly informed about (C)APD (73% of SLTs, 79% of ASs and 50% of EPs). A larger percentage of the educational psychologists (50%) considered themselves to be adequately, well or very well informed about (C)APD compared with the other groups (27% SLTs, 21% ASs). With regard to assessment and treatment, the majority of
participants rated their knowledge and skills in this area as poor or very poor (see Figures 3 and 4).

When participants were asked if they had an awareness of a (C)APD service in Ireland, only 5% \((n = 11\) SLTs and \(n = 1\) EP) indicated they were aware of such a service. Four participants were aware of a community-based service, six participants were aware of a private service, one participant was aware of a hospital-based service and one participant did not specify the nature of the service.

With regard to estimating the number of children on their caseloads who required screening for (C)APD, the majority of participants (39%) reported that they had under five children on their caseload requiring screening, 48% reported that they had between six and twenty children requiring screening and 13% reported that they had more than twenty children on their caseload requiring screening.

Provision of services for children with (C)APD in Ireland.

Participants were asked if they currently screened or diagnosed children with (C)APD and if they provided a management service for children with suspected (C)APD, and the results can be seen in Figure 5. The majority of participants reported that they did not provide a screening or diagnostic service for children but nearly half of the participants (48%) reported that they provided management for children with suspected (C)APD. When asked why they do not currently screen for (C)APD, the greater percentage of respondents (81%) indicated that this was due to inadequate training and lack of resources. The participants who reported that they currently screen for (C)APD were requested to indicate what assessment tools they used to
screen and/or diagnose. These tools included SCAN-C (Keith, 2000) and standardized language, psychometric, and phonological awareness assessments. In addition, the respondents indicated that they used the psycholinguistic framework (Stackhouse & Wells, 1997), informal screening techniques (e.g., checklists, observations), and consultation with other professionals and parents when they were assessing children with suspected (C)APD. Of the 48% of participants who provided management for children suspected as presenting with (C)APD, for the majority of respondents (88% or \( n = 92 \) SLTs, \( n = 6 \) EPs, and \( n = 1 \) AS) this consisted mainly of providing advice. Only 1% of this group rated the advice as ‘very effective’, 24% rated it as ‘effective’, 42% considered it was ‘adequate’, and 33% rated the advice as ‘somewhat ineffective’.

Where participants had a child on their caseload with a diagnosis of (C)APD, they were requested to indicate where that diagnosis was made. Only 4% (\( n = 6 \)) of the participants had children on their caseloads with a diagnosis of (C)APD, and of those half (\( n = 3 \)) indicated that the diagnosis was made in the USA or UK and the other half (\( n = 3 \)) indicated that the diagnosis was made in Ireland. The responses were not specific regarding the nature of the services involved in the diagnosis.

**First steps in developing a service in Ireland.**

The participants were requested to indicate the first steps that were required to develop a service for children with (C)APD in Ireland. Thirty-three percent of participants indicated a need for further research. Thirty-two percent of the participants believed that there was a need for a specialist service that was responsible for the diagnosis of (C)APD. The participants suggested that this service would be
staffed by an interdisciplinary team, whose work would be guided by best practice
guidelines for the assessment and management of (C)APD. Twenty-three percent of
the participants indicated that there was a need for training and information for
professionals, including teachers. Twelve percent of participants argued for a need for
additional resources (e.g., human resources, time and materials for screening,
assessment and intervention).

Discussion.

This research project was the first attempt to investigate service provision for children
with (C)APD in Ireland. The project was conducted in response to a perceived gap in
services for children with (C)APD in Ireland. The relatively high response rate to the
survey suggested that there was a national interest in this clinical area in Ireland.

The results of this study were broadly comparable to those of Chermak et al. (1998),
Chermak et al. (2007) and Hind (2006) in that the findings of all of these studies
suggested that there was a lack of understanding, systematic identification and
management of this condition. In the current study, there was a consensus among the
key professionals that there was a gap in service provision for children with (C)APD.

With regard to professional preparedness, the majority of participants in the current
study did not consider themselves to be well informed about (C)APD. These results
are comparable to Hind (2006) who found that 58% of the participants in the UK
study rated themselves as ‘not well’ informed, and 20% rated themselves as ‘quite
well’ informed. In the current study, 60% of the participants reported that they were
‘poorly’ informed, with only 8% reporting that they were ‘very well’ or ‘well’
informed. Chermak et al. (2007) noted an improvement in academic preparedness for audiologists in the area of (C)APD in 2007 compared with the findings of an earlier study in 1998 (Chermak et al., 1998). However, they also noted little change in clinical preparation among audiologists in this time period. Between the years of 1998 and 2007 in the US, there was a transition in the entry-level requirement for audiologists to doctoral level education, whereas the entry-level for audiological scientists in Ireland the UK is masters level. The results of the current study are perhaps not surprising, given that many professionals may not have received input on this clinical condition in their undergraduate/postgraduate education. The results suggest that there is a need to educate the professionals involved in the assessment and management of children with (C)APD because the majority of participants believed that they were not adequately equipped to provide services for children with this disorder. It would also be useful to ascertain if and how (C)APD is currently taught in relevant undergraduate or postgraduate education programs. The participants in the current study reported that they were frustrated about lack of knowledge and training in this area and they were attempting to address this gap through self-directed reading, attendance at training events, and discussing (C)APD with other professionals.

With regard to screening and diagnostic services, the findings of this study are similar to Hind (2006) in that the majority of participants neither screen nor diagnose (C)APD. In this study, only 3% of the participants reported that they diagnosed (C)APD and all were SLTs (n = 6). This differed from the findings of Hind’s (2006) study, where the majority of respondents who reported that they diagnosed (C)APD were in the audiology service. The participants in the current study were asked what
assessment tools they used to make the diagnosis and they reported that they used the SCAN-C (Keith, 2000), speech and language and auditory processing assessments. Therefore it is clear that current international best practice clinical guidelines are not being followed. The AAA (2010) guidelines state clearly that speech, language and psychological tests cannot be used to diagnose (C)APD even if the term ‘auditory processing’ is included in their titles or subtest descriptions. In the current study, the only participants who reported that they diagnosed (C)APD were speech and language therapists \((n = 6)\) and this is possibly due to a lack of understanding of (C)APD among these speech and language therapists.

Participants were asked to estimate the numbers of children on their caseloads who they considered may require screening for this disorder. The response varied from under five to over twenty children. Hind (2006) reported variability in the number of children identified with APD in their study and concluded that it may not be possible to ascertain accurate numbers of cases from a survey. In the UK and current study, a working definition of (C)APD was not given so it is not clear what criteria or clinical markers the participants were using when they were estimating the numbers of children requiring screening.

With regard to management of children with (C)APD, in Hind’s (2006) study 84% of the participants who had children with APD on their caseload provided a management program. This comprised mainly of advice with only 5% of participants rating the advice as ‘very effective’. In the current study, participants were asked if they provided a management program to children with suspected (C)APD and 48% of the respondents reported that they did, with the majority offering verbal ‘advice’. This raises ethical concerns as the participants were providing advice for children with
suspected (C)APD even though these children were not diagnosed with this condition. However, it is not clear from the results of the survey what criteria the participants were using to define (C)APD. The majority of participants who provided advice were speech and language therapists who may have been referring to children with speech, language, and communication impairments with underlying phonological processing difficulties rather than those with (C)APD.

The results of this study highlight the lack of diagnostic or management services for children with suspected (C)APD in Ireland and suggest that clinicians are attempting to address this gap e.g., by providing advice to clients. However, this provides evidence for the loose arrangement that can emerge in the absence of a service for these children.

There were some limitations in phase one of the study. Although the response rate was relatively high for speech and language therapists (62%), and audiological scientists (60%), the response rate for the educational psychologists was relatively low (23%). Following consultation with the head of the educational psychology service, it was agreed that the research team would provide the survey online to educational psychologists to maximize the response rate. Although the response rate for the audiological scientists was high, the overall sample size for this group is small ($n = 9$) due to the small number of audiological scientists working in the HSE in Ireland ($n = 16$). The participants in phase one of the study were limited to speech and language therapists, audiological scientists and educational psychologists. There is acknowledgment that other professionals need to be involved in the management of children with (C)APD (e.g., the AAA (2010) state that doctors and teachers may be
important referral sources as they may be the first professionals to whom parents turn when they have concerns about their children’s listening and learning skills).

Secondly, while this survey was based on a similar survey developed in the UK, there were some shortcomings. There was no reliability measure on either survey. There was no information available on the validity of the Hind (2006) survey. However, it has been developed by professionals with an interest and expertise in this area. Participants were not given a clear definition of (C)APD to use as a guide or benchmark when answering the questions on the survey and therefore they responded to questions using their own working definitions and understandings of this disorder. This undoubtedly resulted in variable responses. The term ‘auditory processing’ is frequently used by all three professions who participated in the current survey and the results suggested that the participants may have confused (C)APD with phonological processing difficulties.

**Phase Two**

The results of phase one of the study highlighted that key professionals considered that they were poorly informed about (C)APD. In addition, the results of phase one provided evidence there was a lack of service provision for children with (C)APD in Ireland. In order to progress the development of services in Ireland, the research team subsequently commenced phase two of the research. The overall aim of this phase was to explore the initial steps required in the development of an integrated service for children with (C)APD in Ireland. The objectives were:

1. To provide feedback on the results of the survey to key stakeholders and to begin to develop a common understanding of (C)APD
2. To identify the initial steps required to develop an integrated service for children in Ireland with (C)APD.

**Design.**

Given the interdisciplinary nature of (C)APD and the need to develop an integrated service, a qualitative participative design was used that was based on a ‘whole-systems’ approach. Qualitative methods can complement quantitative methods by providing an opportunity to understand people’s experiences of phenomena in their own terms (Cheek, Onslow, & Cream, 2004; Tetnowski & Franklin, 2003). Qualitative methods offer “the opportunity to ‘unpack’ issues, to see what they are about or what lies inside, and to explore how they are understood by those connected with them” (Ritchie, 2006:27).

**Recruitment of participants.**

In purposive sampling, the sample is chosen because they are considered to have particular characteristics that would enable detailed exploration and understanding of the central themes and puzzles that the researcher wishes to study (Richie, 2006). In this case, the participants were the key stakeholders who would be involved in the development and provision of services to children with (C)APD. In addition to audiological scientists, speech and language therapists and psychologists, the research team also invited occupational therapists, who had expressed an interest in this clinical area, and health care managers. By ensuring inclusion of representatives from these disciplines, the ‘whole-system’ of professionals involved in the delivery of services to children with (C)APD would be represented. A facilitated one-day large-scale event was designed, in consultation with an expert in organizational
development, who also had a clinical background and was familiar with the issues involved in developing integrated services. The event was designed to address the aim and objectives of phase two of the study. Detailed information about the event and invitations to attend were sent to:

- Speech and Language Therapy Managers in Ireland \((n = 79)\) for distribution to staff \((n = 404)\)
- NEPS manager \((n = 1)\) for distribution to staff \((n = 100)\)
- Each audiological scientist \((n = 16)\)
- The Heads of academic Speech and Language Therapy programs \((n = 3)\) for distribution to staff
- Occupational therapists who had personally contacted the principal investigator expressing an interest in being involved \((n = 4)\)
- The Association of Occupational Therapists in Ireland (AOTI) for distribution to their members.

The first aim of phase two of the study was to provide feedback on the results of the survey to key stakeholders and to begin to develop a common understanding of (C)APD. In the morning session of the one-day event, a group of UK experts currently involved in research and clinical practice with children with (C)APD (from the disciplines of audiological science, speech and language therapy, psychology and medicine) were invited to present on different aspects of (C)APD and service delivery for these children. In addition, the results of phase one of the research were also disseminated to the participants. The (C)APD Research Group had developed a working definition of this disorder, based on the definition of the APD UK group (2007) and the ASHA (2005) definition. The working definition was: (C)APD is
characterized by poor recognition, discrimination, separation, grouping, localization, or ordering of auditory information and results from impaired neural function. It does not solely result from a deficit in general attention, language or other cognitive processes. This definition was discussed and shared with participants to facilitate a shared understanding of this disorder.

The second aim of phase two was to identity the initial steps required to develop an integrated service for children in Ireland with (C)APD. In the afternoon session of the one-day event a facilitator, with a clinical and organizational development background, allocated the participants into ten interdisciplinary groups (with approximately ten participants in each group), with each group comprising representatives from each discipline and geographic area. Participants were seated at round tables to facilitate open interdisciplinary discussions. The facilitator, in consultation with the research team, designed key tasks to generate data and the participants were requested to:

- Reflect on what they had heard in the morning session and consider the implications of these data for the development of an integrated service for children with (C)APD in the Irish context
- Work together to design an ideal pathway for children with (C)APD and contrast it with the current clinical pathway
- Identify current facilitators and barriers towards the development of a (C)APD service in Ireland
- Identify key recommendations for the development of a service
• Prioritize three of these recommendations - each group member was given three votes (in the form of stickers) to highlight their three priorities from the group’s list of key actions).

Each task was presented one at a time and the participants were requested to nominate one person to record the main points of their discussion on flip-charts; these data were collected after each task.

**Data analysis.**

The data from the flip-charts were subsequently transcribed and analyzed by the research group using the framework approach described by Ritchie, Spencer & O’Connor (2006). Using this method, the research team developed an overall framework that was based on the key research questions. They used this framework to classify and organize the data according to key themes, concepts and emergent categories (Ritchie et al., 2006). The data from all of the groups were collated and coded into the key themes in the framework.

**Results.**

The overall aim of phase two was to explore the initial steps required in the development of an integrated service for children with (C)APD in Ireland. In total 112 professionals participated in this event (n = 77 SLTs, n = 14 ASs, n = 2 EPs, n = 2 occupational therapists, n = 3 audiologists, n = 6 presenters, n = 1 primary care specialist, n = 1 SLT lecturer, n = 5 members of the (C)APD Ireland Research Group, and a facilitator).
The data collected at the facilitated, large-scale, one-day event were analyzed and coded into a framework of four key thematic categories which are:

1. Participants’ reflections following the information-giving session
2. Ideal pathway for integrated (C)APD service in Ireland
3. Facilitators and barriers to the development of an ideal integrated pathway of care
4. Key prioritized actions for the development of an ideal integrated pathway of care.

**Theme 1: Reflections on the information-giving session.**

Four sub-themes emerged and there was some overlap between these sub-themes.

**Sub-theme 1: Professional practice.**

Participants reported that they agreed with the findings of the survey in phase one of this study, i.e. they confirmed that they did not consider themselves to be well informed about (C)APD and there were no identified pathways of care or services available for these children. Participants reported that they were striving to provide services to children with complex needs (e.g., children presenting with specific language impairment (SLI), attention deficit and hyperactivity disorder (ADHD) and autistic spectrum disorder (ASD)). However, they were concerned that they were not doing enough to provide a targeted service to children who may be presenting with (C)APD because they did not feel well informed about this disorder.

Participants agreed that children with (C)APD require an interdisciplinary approach and therefore the solution must involve all key disciplines. Participants identified a
need to develop strong collaborative working relationships with a range of disciplines and this process would require clearer understanding of the respective roles of key professionals. They identified a need for a clear pathway including referral, screening, diagnostic assessment and management and some participants considered that there is a need for a tertiary centre for the diagnosis of (C)APD. One group also indicated the need to consider (C)APD in adults with acquired disorders. The one-day event highlighted the value of liaising with UK colleagues in the field.

Sub-theme 2: Personal.
Participants also reported frustration with the lack of services and resources for the assessment and diagnosis of, and intervention for, children with (C)APD in Ireland. Participants were relieved that this interdisciplinary event provided a unique opportunity to develop a shared understanding of (C)APD and the commencement of discussions on the development of a service for these children in Ireland.

Sub-theme 3: Resources.
The participants noted the lack of personnel, in particular the acute shortage of audiology professionals, as well as issues such as time, access to diagnostic assessment procedures and therapeutic resources.

Sub-theme 4: Education.
All participants identified a need for training of all key professionals in health and education on (C)APD at undergraduate and postgraduate level. They recommended that information also needs to be disseminated to other professionals (e.g., general practitioners, teachers) and parents. The participants also identified a need for further
research and a strong evidence base for the diagnosis and effective management of children with (C)APD.

**Theme 2: Ideal pathway for integrated (C)APD service in Ireland.**

The participants, in interdisciplinary groups, designed an ideal pathway of care for children with (C)APD in Ireland. The service delivery model that emerged from the discussions was very similar to that proposed by Bellis (2003) and thus the Bellis (2003) framework was adapted to reflect the ideal pathway of care proposed for the Irish context. In Ireland, the primary care health services are divided into four geographic regions. In the ideal pathway of care, it was envisaged that each primary care area would screen children whom they suspect may present with (C)APD using screening tools and agreed protocols. These teams would then refer children to a national tertiary interdisciplinary (C)APD clinic. The tertiary (C)APD team would carry out diagnostic assessments using reliable and valid tools as outlined in best practice guidelines, and would make recommendations for management to the local primary care team. The tertiary (C)APD team would also facilitate learning events for professionals and parents to increase knowledge and awareness of this disorder.

**Theme 3: Facilitators and barriers to the development of an ideal integrated pathway of care.**

Participants identified a number of facilitators to the development of an ideal integrated pathway of care including interdisciplinary interest in developing a (C)APD service and access to international current research in the field of (C)APD.
Participants identified three main barriers to the development of an ideal integrated pathway of care. The first of these barriers was a lack of resources, including culturally appropriate screening and diagnostic tools. The second barrier identified was lack of access to key professionals involved in the diagnosis and management of (C)APD, in particular audiological scientists (given the paucity of audiology services in Ireland, priority is allocated to assessment of hearing acuity). Although strategic plans recommend interdisciplinary and interagency working, the current thinking and practices are primarily uni-disciplinary and there is little collaboration between health and education at all levels. The third barrier that participants identified was a lack of training opportunities to develop knowledge and skills for working in this area.

**Theme 4: Key prioritized recommendations for the development of an ideal integrated pathway of care.**

Each group identified key actions required to develop an integrated service for (C)APD in Ireland and then each participant prioritized the top three actions in their group. These data were collated and the total number of votes for the actions identified in each group was calculated. Following this process votes from all of the groups were calculated and the following seven priority recommendations emerged. The recommendations are presented in order of priority as identified by participants.

- To promote and develop interdisciplinary working at local and tertiary levels to provide an integrated, holistic service for children with (C)APD.
- To obtain additional resources to develop services for children with (C)APD in Ireland, especially audiology staff.
- To establish interdisciplinary training programs for all professionals involved in the management of (C)APD working in the health and education services.
through undergraduate, postgraduate and continuing professional development programs. It was also recommended that key professionals would be identified in each region who would act as a resource for practitioners in that area.

- To inform all stakeholders of the current working definition of (C)APD and make diagnostic indicators explicit.
- To access the current international evidence base and research on assessment and management of (C)APD and to carry out further research in Ireland, in particular the development of Irish normative data for diagnostic tests.
- To inform policy makers in health and education of the need to develop eligibility criteria so that children identified with (C)APD can access additional educational resources to meet their specific needs, including intervention focused specifically on the child’s impairment and the classroom environment.

Discussion.

The large-scale one-day event was an innovative participative method that provided practitioners with an opportunity to share their ideas in an interdisciplined forum and design an ideal pathway of care using a ‘bottom-up’ approach. This provided the participants with a sense of ownership and ‘buy-in’ to the process. The combination of an information-provision session and a data collection session worked well in attracting participants to attend the event. Participants envisaged an ideal care pathway for children with (C)APD that would provide an integrated service for children. The need for inter-professional collaboration at a local, national and policy level was clear and this finding is consistent with Dawes and Bishop’s (2009) point that (C)APD seems to sit on the crossroads of different disciplines. Ferre (2007)
argues that audiologists and speech and language therapists are uniquely positioned to share valuable information in the assessment and management of children with (C)APD. Therefore the participation and response rates of speech and language therapists and audiological scientists in both phases of the study are encouraging. Given that the needs of children with (C)APD require the involvement of a range of professionals in health and education, there is a need for collaboration between the Department of Education and Skills, the Department of Health and Children and the Health Service Executive (HSE) to develop an integrated service.

Conclusions
This study had many strengths including an interdisciplinary approach to the research, relatively high response and participation rates, the use of available networks for recruitment of participants, and the flexibility in methods used to collect the data. There is debate about how qualitative and quantitative methods can be combined in research given that they are underpinned by different ontological and epistemological stances. However, these research methods should not necessarily be seen as mutually exclusive but rather as complementary because they yield different types of data and understandings of the phenomenon under review (Ritchie, 2006).

This research has provided a useful forum to highlight current and future service provision for children with (C)APD in Ireland and this model may be useful in other countries. The current health and education policy in Ireland provides an ideal platform to progress the recommendations of this research. There is national interdisciplinary interest in progressing the development of a service for these children and this research provides clear recommendations for the development of an
ideal pathway for these children in Ireland. One of the key findings of this study was the lack of evidence-based practices in the assessment and management of children with (C)APD. Despite the number of publications on this topic, clinicians are continuing to report that they have insufficient knowledge and skills necessary to provide services to this group of children. Two key recommendations to progress the development of evidence-based services in Ireland emerged from this study. The first key recommendation was to promote and develop interdisciplinary working at local and tertiary levels. The second key recommendation was to establish interdisciplinary education programs for all professionals who would be involved in the management of children with (C)APD. Subsequent to the submission of this research report to the HSE, funding was made available to provide interdisciplinary education on this topic. To date, two interdisciplinary learning events, with an emphasis on evidence-based practice, have been delivered to address the gap in knowledge and skills reported by participants in this study. The recommendations from this research are continuing to guide the development of evidence-based services for children with (C)APD in Ireland.

Acknowledgements

The authors would like to acknowledge the following for their contributions to this research: the HSE for funding the research; Ms. Libby Kinneen, Organisational Manager, HSE, for supporting the team with the design and delivery of phase two of the study; Mr. Travis Ryan, research assistant in phase one of the study; and to all of the participants who were involved in the study.

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