# Level 3 Extended Project H856

# Exemplar Folder 3

ocr.org.uk/extendedproject

# Extended Project Exemplar 3 - 46/60 A

# Treatment of Cerebral Palsy

**AO1 -** Top Level Two is right. There are flaws in the planning process, but student clearly learned a lot and was aware of issues and how to develop. Plan changes are fairly well documented and some of the reasoning is sound. Deadlines met. Research logs show enough evidence about planning changes for L2. OK on choice and independence. Reasoning behind choice?

**AO2 -** Agreed. Level Three. Good range of resources and way in which they were researched. Evidence of genuine independence there. Evaluation of resources very good indeed, clearly well trained. Research diary invaluable here. Good evidence of process. Very thoughtful comments on research.

**AO3 -** Agreed. Low Level Three. A better idea of the journey would have helped. What sort of base started from? Obviously moving into an unknown area, so quite an achievement. Really felt that this student had learned a lot on skills front. Presentation evidence very useful here, presentation well used by both student and assessors. Sound thinking and focus on skills.

**AO4 -** Perhaps a little high? Could argue a case for top L2 or bottom L3. Evidence very good, just needed a bit more on process as well as outcome. Again presentation well used for illustrating this AO and research diary again vital. Leads on to? Personal development?

**General points**

Clearly a well trained student. Well aware of what it was all about. Always the right focus on skills, yet there was real achievement here. Full research diary invaluable-[sample only shown]. Vital for evidence of AO1, 2 and 4. Different start point from Exemplar 1. Centre good at standardising. Comments appropriate and always highly objective.

OCR
RECOGNISING ACHIEVEMENT

# Extended Project (Level 3)
## Unit H856
### Unit Recording Sheet

Please read the instructions printed at the end of this form. **One** of these cover sheets, suitably completed, should be attached to the assessed work of **each** candidate.

| | | | | | |
|---|---|---|---|---|---|
| **Unit Code** | **H856** | | **Year** | **2009** | |
| **Centre Name** | | | **Centre Number** | | |
| **Candidate Name** | | | **Candidate Number** | | |

| AO | Criteria | | | Teacher Comment | Mark |
|---|---|---|---|---|---|
| 1 | • Selected a suitable topic and produced a piece of work that reflects a design formulated with the assistance of their teacher/mentor<br>• Taken an adequate degree of responsibility for their project, planning and managing the work through measures addressing its sequencing, its breakdown into intermediate tasks and monitoring its progress. In a group setting, responsibility will have been taken for closely defined tasks assigned by the group<br>• Developed adequate organisational, IT, decision-making and problem-solving skills necessary to realise the project, responding to changing circumstances<br>• Completed the project within the agreed time schedule<br>**[0 1 2 3 4]** | • Proposed a suitable topic and produced a piece of work that reflects a design negotiated with their teacher/mentor<br>• Taken substantial responsibility for their project, effectively planning and managing the work including sequencing, its breakdown into intermediate tasks and monitoring its progress. In a group setting, responsibility will have been taken for aspects of group work with active participation in group decision-making<br>• Developed proficient organisational, IT, decision-making and problem-solving skills and used them effectively to realise the project, recognising and responding to changing circumstances<br>• Completed the project within the agreed time schedule, meeting most intermediate goals<br>**[5 6 7 8]** | • Proposed a suitable topic and produced a piece of work that reflects a design proposed to their teacher/mentor and with limited negotiation/support of their teacher/mentor<br>• Taken full responsibility for their project, skillfully planning and managing every aspect of the work. In a group setting, responsibility will have been taken for directing and monitoring aspects of group work with some leadership of group decision-making<br>• Developed proficient IT and sophisticated organisational, decision-making and problem-solving skills and used them creatively to realise the project, effectively managing changing circumstances<br>• Completed the project within the agreed time schedule, meeting all, or virtually all, intermediate goals<br>**[9 10 11 12]** | Planning skills? Change of focus as progressed? Initiative in contacting appropriate libraries. Wide use of ICT skills in accessing materials.<br><br>8/12<br><br>Plan of action? Timescales? Resp:Planned but changed title twice as resources found. Followed plan of action and met deadlines. | **8** |

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| 2 | • A limited range of sources has been used to obtain, select, collate and analyse information and data relevant to the project. Guidance on the choice and interpretation of sources has been given by the teacher/mentor<br><br>• Some understanding of connections and linkages between different types of resource and the complexities inherent in their project has been developed<br><br>• A limited range of appropriate technology and related technical skills have been used to aid the collection of information and data. E-learning has been used, where appropriate<br><br>• Where relevant, some information and/or data has been obtained through working with others in the context of engagement in a business, social-community venture/enterprise or through involvement in a local, regional or international team Extended Project. The learner has participated in a limited way within the context<br><br>[0 1 2 3 4] | • An appropriate range of sources has been used to obtain, select, collate and analyse information and data relevant to the project. Some guidance on the choice and interpretation of sources has been given by the teacher/mentor<br><br>• An effective understanding of connections and linkages between different types of resource and the complexities inherent in their project has been developed<br><br>• A range of appropriate technology and related technical skills have been used to aid the collection of information and data. E-learning has been used effectively to further the aims of the project, where appropriate<br><br>• Where relevant, a range of appropriate information and/or data has been obtained through working with others in the context of engagement in a business, social-community venture/ enterprise or through involvement in a local, regional or international team Extended Project. The learner has been an active participant within the context<br><br>[5 6 7 8] | • A wide range of sources has been used to obtain, select, collate and analyse information and data relevant to the project. Little or no guidance on the choice and interpretation of sources has been given by the teacher/mentor<br><br>• A sophisticated and perceptive understanding of connections and linkages between different types of resource and the complexities inherent in their project has been developed<br><br>• A wide range of appropriate technology and related technical skills have been used to aid the collection of information and data. E-learning has been used skilfully and critically to further the aims of the project, where appropriate<br><br>• Where relevant, a wide range of appropriate information and/or data has been obtained working with others in the context of engagement in a business, social-community venture/enterprise or through involvement in a local, regional or international team Extended Project. The learner has offered leadership or direction within the context<br><br>[9 10 11 12] | Very wide range and number of sources used from different media.<br>No input required from mentor.<br><br>10/12<br><br>Much of the found information was very specialist so had to refine question to something more general. | **10** |

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| 3 | • Some appropriate skills have been selected and used in relation to the context of the project in order to solve problems, take decisions and achieve the planned outcome. These skills may include problem-solving techniques, analytical techniques, PLTS, functional skills, presentational skills and technical skills of various kinds. There is some evidence of the critical, creative and flexible use of skills in the furtherance of the project's development and realisation<br><br>• Some appropriate technologies, including relevant new technologies, have been used to assist the process of problem-solving, decision-making and achieving the planned outcome. There is some evidence of the critical, creative and flexible use of technology in the furtherance of the project's development and realisation<br><br>**[0 1 2 3 4 5 6 7 8]** | • A range of appropriate skills have been selected and used effectively in relation to the context of the project in order to solve problems, take decisions and achieve the planned outcome. These skills may include problem-solving techniques, analytical techniques, PLTS, functional skills, presentational skills and technical skills of various kinds. There is evidence of the critical, creative and flexible use of skills in the furtherance of the project's development and realisation<br><br>• A range of appropriate technologies, including relevant new technologies, have been used effectively to assist the process of problem-solving, decision-making and achieving the planned outcome. There is evidence of the critical, creative and flexible use of technology in the furtherance of the project's development and realisation<br><br>**[9 10 11 12 13 14 15 16]** | • A wide range of appropriate skills have been selected and used in a sophisticated manner in relation to the context of the project in order to solve problems, take decisions and achieve the planned outcome. These skills may include problem-solving techniques, analytical techniques, PLTS, functional skills, presentational skills and technical skills of various kinds. There is clear evidence throughout of the critical, creative and flexible use of skills in the furtherance of the project's development and realisation<br><br>• A range of appropriate technologies, including relevant new technologies, have been used in a sophisticated manner to assist the process of problem-solving, decision-making and achieving the planned outcome. There is clear evidence throughout of the critical, creative and flexible use of technology in the furtherance of the project's development and realisation<br><br>**[17 18 19 20 21 22 23 24]** | Good use of footnotes.<br>Problem solving. lack of understandable/accessible resources?<br>Use of technologies? e-books in particular.<br>PAP shows reflection and evolution of final product.<br><br>18/24<br><br>Developed research and time management skills; use of Google Scholar and external libraries and their search tools. | **18** |

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| 4 | • Although limited in scope, a critical, reflective and independent approach to learning has been developed. A limited attempt has been made to present an accurate review of their work covering both development aspects and the eventual outcome of the project. This may relate to the learner's participation and contribution to a group project in a social-community venture/enterprise and/or local, regional or international team project<br><br>• A limited usage of communication skills and media to present a broadly effective review of the development and outcome of the project<br><br>[0 1 2 3 4] | • A critical, reflective and independent approach to learning has been developed. They present a thorough and accurate review of their work covering both development aspects and the eventual outcome of the project. This may relate to the learner's participation and contribution to a group project in a social-community venture/enterprise and/or local, regional or international team project<br><br>• A broad usage of communication skills and media to present an effective and comprehensive review of the development and outcome of the project<br><br>• The presentation has broadly met the needs of its intended specialist and/or non-specialist audience*<br><br>• They have appropriately addressed the issue of personal, academic and career development beyond the confines, but informed by, their participation in the project, including their development of transferable skills<br><br>[5 6 7 8] | • An incisive critical, reflective and independent approach to learning has been developed. They present a perceptive, thorough and accurate review of their work covering both development aspects and the eventual outcome of the project. This may relate to the learner's participation and contribution to a group project in a social-community venture/enterprise and/or local, regional or international team project<br><br>• A sophisticated usage of communication skills and media to present a perceptive, effective and comprehensive review of the development and outcome of the project<br><br>• The presentation has met all the needs of its intended specialist and/or non-specialist audience. The audience was engaged and entertained*<br><br>• They have addressed clearly and realistically the issue of personal, academic and career development beyond the confines, but informed by, their participation in the project, including their development of transferable skills. They clearly understand what has been achieved and where it can lead them<br><br>[9 10 11 12] | Good presentation skills throughout. Links to long-term interests in Physiotherapy. | 10 |
| | | | | Total /60 | 46 |

## Guidance on Completion of this Form

1 **One** sheet should be used for each candidate.

2 Please ensure that the appropriate boxes at the top of the form are completed.

3 Circle the mark awarded for each strand of the marking criteria in the appropriate box.

4 Add the marks for the strands together to give a total out of 60. Enter this total in the relevant box.

Name:
Mentor: ADC
Title of Project: To what extent are different treatments effective in treating children with cerebral palsy?

## Evaluation Sheet

| | |
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| **What were the main strengths and weaknesses of the Project?** | I think that the main strength of my project is that I have produced a detailed and analytical dissertation, which directly answers the question in my project title. Another strength of my project is that I carefully followed my project plan throughout the project, meaning that I remained on schedule at all times and met all of the deadlines set. A weakness of my project however has been that most of my sources have been online ones, since I found there was a lack of books available on the topic at local libraries. Although I carefully assessed their reliability before using the information for my project, reliability of the sources cannot be guaranteed. Another problem with my project is that to begin with I spent a great deal of time researching areas not directly relevant to my final project title, due to realising that my original project title did not meet the assessment criteria of the project. This therefore meant that I wasted valuable research time; although it could be argued that this additional research did give me a greater overall knowledge of cerebral palsy. |
| **What new skills did you learn/what new technologies did you use?** | In my project I learned how to use headings in Microsoft Word to structure my dissertation. I also found out how Google can be used for not only Google search, but Google Scholar and Google Books as well, which I hadn't previously used but were very useful in my research. In addition to this I learned how to reference using the Havard system of referencing, whilst also learning to use footnotes. |
| **In doing the Project, what did you learn about yourself and the way in which you learn?** | I have learned that my notes are most effective when using bullet points, as this makes it easier for me to take in and understand the information. I realised that note taking involving writing out large chunks of text was very ineffective for me. Highlighting important sections of text is another method that I used when carrying out my research. |
| **Has the Project helped you in terms of your future plans? (eg study at university; career choices; going into employment)** | The Project has helped me in terms of my future plans which are to study physiotherapy at university, before hopefully working as a physiotherapist in a hospital. It is an area of research that I have found to be very fascinating and so it has confirmed that a career in physiotherapy is the career that I would like to pursue. It has allowed me to get practice at writing |

Name:
Mentor: ADC
Title of Project: To what extent are different treatments effective in treating children with cerebral palsy?

| | |
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| | a dissertation, which is a skill that I will require when studying at university, as well as the ability to learn independently. Also, I have learned how to use the Havard system of referencing and to create footnotes, which I am sure will be great help in the future when carrying out other research projects. In addition to these skills I have also gained a better knowledge of the condition cerebral palsy and the important considerations for treatment, and I believe that this knowledge will be of great benefit to me in the future when being a physiotherapist. |
| **If you were to start your Project again, what would you do differently and what would you keep the same?** | If I were to do the Project again I would ensure that my project title carefully met the assessment criteria before beginning the Project, to ensure that extra and unnecessary research was not done. This would therefore leave me more time to do the research needed for my final dissertation. However, some aspects of my project I would keep the same. For instance, I would create another project plan before beginning my research, since this enabled me to track my progress throughout the research process, as well as ensuring that I did not fall behind schedule. I would also attend lots of the lunchtime sessions on different aspects of the Project, in the same way that I did this time around, as I found these to be very helpful, as they gave me some ideas for my own project. |
| **Any other thoughts and comments?** | I found the Project to be great for gaining experience at independent learning which is a skill expected at university. I found the lack of guidance difficult to begin with; however I soon developed greater confidence in my abilities to work independently. |

# Extended Project Final Presentation Prompts

## Why did I choose this area of research?

- Cerebral palsy, commonly known as CP, is a condition that I am interested in, however one that I knew very little about
- I am going to study physiotherapy at university next year, with the intention of a future career working as a physiotherapist in a hospital
- This area of research will allow me to gain an overview into what CP is and the treatments available for it, increasing my overall general medical knowledge

## How did I develop my project title?

- Did some brief initial research and decided I wanted to look at physiotherapy and cerebral palsy so came up with the question 'How does physiotherapy make a difference to the lives of children with cerebral palsy?' After a meeting with my mentor I decided that this title was not specific enough.
- Changed project title to 'What is cerebral palsy and what physiotherapy techniques are used to improve the lives of children suffering from it?' I began to carry out research and found lots of information about what cerebral palsy was. However when I began to look at physiotherapy techniques I soon realised that this area of research was not possible for my project, since I was lacking in the specialist knowledge that a physiotherapist has. Nearly all the materials on the topic were aimed at qualified physiotherapists and therefore were too complicated for me to be able to understand.
- Therefore I decided to look at treatments and therapies for CP instead and came up with a project title of 'What is cerebral palsy, and what treatments and therapies are available to children suffering from the condition?' This project title was much easier to research, however I found that this question did not meet the assessment criteria for the project, due to the information being descriptive and not analytical.
- This led me to create my final project title 'To what extent are different treatments effective in treating children with cerebral palsy? This title was very appropriate as all of the information in my dissertation carefully answered this question, and it allowed for a great deal of analytical content.

## What resources did I use?

- Visited the Anglia Ruskin library and found a very useful book on cerebral palsy
- Lots of my research, particularly into the effectiveness of treatments, came from online sources. For instance, I used online journals, websites, and e-books from Google books. I found Google books to be a very helpful source as it allowed me to view useful information from books online, without the need for buying them, which would be very expensive.
- Also bought 2 books from the internet, about cerebral palsy. I found 'Children with cerebral palsy: A parents' guide' to be the most helpful of the 2 books since it was aimed at a non-specialist audience and so was easier to understand. The other book 'Children with cerebral palsy: A manual for therapists, parents and community workers' was aimed at a more specialist audience and included terms which I found difficult to understand.

## What did I learn from my research?

- **Cerebral palsy**- movement disorder which causes a person to have difficulty either producing, preventing or controlling movement. It is due to an injury to the brain before or during birth, or in the first five years of life.
- **Hyperbaric oxygen therapy (HBOT)** - patient placed in a chamber where oxygen is given under increased atmospheric pressure. Has been shown by research to be very effective but may have possible negative side effects from the treatment e.g. damage to the eardrum and blurred vision
- **Hippotherapy**- the use of the movement of a horse as a tool by physical therapists, occupational therapists and speech-language pathologists to address impairments and functional limitations. Supported by research and enjoyed by children, although there are risks associated with it, e.g. if child falls off horse.
- **Suit therapy**- the use of a suit designed to allow the child to gain better control over their muscles by restricting movement of the muscles. It also acts to strengthen the muscles by providing controlled resistance. There is a lack of research evidence supporting the use of suit therapy and therefore alternative treatments should be preferred in most cases.
- **Robotic therapy**- the use of a robotic device that helps a person learn to control their arms and legs. The person's limb is gently guided at the same time as they attempt a specific movement. There is a lack of research into this therapy currently, however in the future the therapy is likely to become more widely used.
- **Physical therapy**- has the goal of identifying and treating problems with movement and posture, or body position. Neurodevelopmental therapy (NDT) seeks to remove infant reflexes which persist in a child with CP. Physical therapy is widely used and is particularly effective when used in combination with another treatment. More research is needed however to investigate the effects of NDT.

### What were the strengths of my project?

- Produced a detailed and analytical dissertation which met the assessment criteria of the project
- Information in dissertation directly answers the question in my project title
- Carefully followed my project plan throughout the project and so remained on schedule at all times, meeting all the deadlines set

### What were the weaknesses of my project?

- Most of my sources I used had been found online, most of which were websites and e-books. Websites may not always be particularly reliable; however e-books should have higher reliability since they are information from published books.
- Wasted research time due to my original project titles not being suitable, since they didn't meet the assessment criteria of the project

### What would I do differently if I were to do the project again?

- I would ensure that my project title carefully met the assessment criteria before beginning my research to avoid doing unnecessary research
- Attempt to find more books in libraries relevant to my project, since books tend to have higher reliability than internet sources

# TO WHAT EXTENT ARE DIFFERENT TREATMENTS EFFECTIVE IN TREATING CHILDREN WITH CEREBRAL PALSY?

# Why did I choose this area of research?

- Cerebral palsy is a condition I knew very little about
- This topic relates to my future career intention of physiotherapy
- To give me an overview of what cerebral palsy is and the treatments available for it, in order to increase my general medical knowledge

# How did I develop my project title?

How does physiotherapy make a difference to the lives of children with cerebral palsy?

↓

What is cerebral palsy and what physiotherapy techniques are used to improve the lives of children suffering from it?

↓

What is cerebral palsy, and what treatments and therapies are available to children suffering from the condition?

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To what extent are different treatments effective in treating children with cerebral palsy?

# What resources did I use?

- Books in the Anglia Ruskin library
- Online sources (journals, websites, e-books)
  - Google search
  - Google books
- Books bought from the internet
- Children with Cerebral Palsy: A Parents' Guide, edited by Elaine Geralis and foreword by Tom Ritter
- Children with Cerebral Palsy: A manual for therapists, parents and community workers, by Archie Hinchcliffe

# What did I learn from my research?

- **Cerebral palsy**
  - movement disorder
  - injury to the brain

- **Hyperbaric oxygen therapy (HBOT)**
  - oxygen chamber
  - increased atmospheric pressure
  - research: very effective
  - negative side effects

- **Hippotherapy**
  - movement of a horse
  - physical therapists, occupational therapists and speech-language pathologist
  - impairments and functional limitations
  - research and enjoyment
  - possible risks

# What did I learn from my research? (continued)

- **Suit therapy**
  - suit designed to help with muscle control and strength
  - lack of research evidence
  - alternative treatments

- **Robotic therapy**
  - robotic device to help limb control
  - limb is gently guided at same time as movement attempts
  - lack of research
  - future

- **Physical therapy**
  - movement and posture, or body position
  - neurodevelopmental therapy (NDT) removes infant reflexes
  - physical therapy : widely used and most effective with other treatments
  - lack of findings into NDT

# What were the strengths of my project?

- Produced a detailed and analytical final dissertation
- Information is closely related to my project title
- Carefully followed my project plan and so remained on schedule at all times, meeting all deadlines set

# What were the weaknesses of my project?

- Most of my sources have been online ones- websites and e-books
- Wasted research time due to original project titles not meeting assessment criteria

# What would I do differently if I were to do the project again?

- Would ensure project title carefully met the assessment criteria before beginning my research to avoid unnecessary research
- Attempt to find more books in libraries relevant to the project

## 500 word summary

For my project I decided that I would like to look at the condition cerebral palsy (CP). As I have progressed with my project I have made some alterations to the title, due to my original aims being unrealistic and unachievable, and have finally decided to use the question 'What is cerebral palsy and how is it treated in children?'

I began by researching information about cerebral palsy, ranging from causes and types of CP, to prevalence and additional disabilities associated with the condition. I found this research to be very interesting and worthwhile, since cerebral palsy is a condition that I knew little about before starting on my research.

After completing all of the necessary research into what cerebral palsy actually is, I moved on to look at treatments and therapies used to treat children with CP. I found this research to be more difficult, due to the large number of different therapies and treatments on offer to CP patients. I had to decide on just a few treatments and therapies to investigate, or else the information I collected would have been too general, and not detailed enough. I believed that it would be better to look at a smaller number of treatments, however to look at them in greater detail, looking at a number of sources for each one.

For my research I have used a wide range of sources. I have read two complete books, 'Children with cerebral palsy: A manual for therapists, parents and community workers' by Archie Hinchcliffe, and 'Children with cerebral palsy: A Parents' Guide' edited by Elaine Geralis. I found the second of these books to be the most useful to me as it gave me a valuable overview of the important issues associated with cerebral palsy, and the difficulties that the families of a child with the condition have to face in their everyday lives. Although the first of the books looked closely at treatment, particularly physiotherapy, a lot of the information was aimed at physiotherapists, meaning that the information was incredibly detailed and therefore difficult for me to understand.

As part of my research I have also visited the Anglia Ruskin library to search for books relevant to my research. Although I found a couple of books there of use to me, I discovered that I could not rely on visiting libraries for the majority of my research. This is a result of my project being on a topic that is very specialised and not necessarily of interest to the general population. Many of the local libraries failed to stock any titles that I was looking for, whilst I couldn't access the Clinical School Library at Addenbrooke's due to being under 18. Instead I have used *Google books*, which was of great help to me, since it enabled me to access books online that were useful to my project, without needing to buy them.

I have now completed my research and have begun writing up my 5000 word dissertation.

## Meeting Record Sheet

| Date | Aim of Meeting | Mentor comments | Actions to be taken/targets set | Actions completed /targets met |
|---|---|---|---|---|
| 29/6. | 1st Mtg. Establish Topic/clarity of thought | Clear ideas - physio & Cerebral Palsy. | Start Drang. V77 by 3/7. Start PAP, TPR. Planning. Set meeting w/c 6/7 for V77. | n/a V77 ✓ |
| 6/7 | Progress Check. | | On target | |
| | | | | |

**Checklist for mentors of student tasks**

**Student name** _____

| W/beg | Task | Completed |
|---|---|---|
| **15 June** | Initial meeting | ✓ |
| | Pack/paperwork given out | ✓ |
| **22 June**<br>**29 June**<br>**6 July** | Discussion of VTT and submission of VTT | – |
| | Fill in sections 1-6 of PPR | – |
| | Hand back and file VTT | – |
| | Discussion of time and action plans | – |
| | Fill in sections 7 and 8 of PPR | |
| **7 Sept** | Discussions of work done so far and check of progress | – q/a |
| | Fill in sections 14-17 of PPR | |
| **14 Sept** | Attend mentor-led session on writing up | |
| **21 Sept** | Completion and discussion of 500 word summary | |
| **28 Sept** | Attend mentor-led session on footnoting and referencing | |
| **5 Oct** | | |
| **12 Oct** | Give presentation on project so far. | |
| **19 Oct** | | |
| **2 Nov** | Rest of PPR completed | |
| | Hand in project by 6 November | |
| **TBA** | Formal student presentations | |
| **TBA** | Moderation and final marking. | |

# EXTENDED PROJECT

# TO WHAT EXTENT ARE DIFFERENT TREATMENTS EFFECTIVE IN TREATING CHILDREN WITH CEREBRAL PALSY?

## Extended Project Evidence Sheet

Indicate on the chart below where in your project we can find the evidence of each skill (choose the best examples). Make sure that your references are clear. In addition, remember that there are **many skills which have not been included on this chart** (because they will be apparent **throughout** the piece) which will be assessed throughout the work (**see your mark scheme for more details**).

| Assessment Objective | Specific Skill | Where evidence can be found |
|---|---|---|
| AO1 (manage) | Identification of the topic to be investigated[1] | PPR<br>Personal Action Plan |
| | Clear evidence of appropriate aims and objectives | PPR<br>Personal action plan |
| | Detailed project plan | Personal Action Plan<br>Initial plan<br>Plan for dissertation |
| | Evidence of monitoring progress of project work against project plan. | Personal Action Plan<br>Initial Plan |
| AO2 (Use resources/research) | Evidence of detailed research | PPR<br>Personal Action Plan<br>Dissertation |
| | Selection of a wide range of sources | Bibliography<br>Dissertation |
| | Evaluation of a wide range of sources | Dissertation<br>PPR<br>Personal Action Plan |
| | Critical analysis and application of the research | Dissertation |
| | Clear links made to appropriate theories and concepts | Dissertation |
| AO3 (Develop/realise) | Clear evidence of change to the original project/plan/titles/aims | Personal Action Plan<br>PPR<br>Initial plan |
| | Clear and appropriate reasons given for any changes | Personal Action Plan<br>PPR<br>Initial plan |
| A04 (review)[2] | Evaluation of strengths and weaknesses of completed project in relation to planning, implementation and final piece (including presentation) | |
| | Evaluation of strengths and weaknesses of completed project in relation to candidate's own learning during the process | |

[1] Eg title, scope of project

[2] Some of this section will take place after the presentation/'viva' has taken place: you will be filling in a final evaluation sheet as part of the process on 4 December.

# To what extent are different treatments effective in treating children with cerebral palsy?

I have been researching the effectiveness of various treatment methods available to children with cerebral palsy (commonly known as CP). Whilst there are a number of different treatments on offer to children with the condition, I have decided to concentrate on just four, due to these treatments being commonly used, as well as having been investigated for their effectiveness in numerous studies.

## Hyperbaric oxygen therapy

Hyperbaric oxygen therapy (HBOT) involves the patient being placed in a chamber with increased atmospheric pressure. They breathe in 100% oxygen through a mask or hood, which saturates the tissues with oxygen, due to oxygen being dissolved into body fluids, plasma, central nervous system fluids, the lymph and bone. Oxygen can then be transported to areas where circulation is reduced or blocked. This allows extra oxygen to reach all of the damaged tissues, resulting in the body being able to support its own healing process. An increase in oxygen "greatly enhances the ability of white blood cells to kill bacteria, reduces swelling and allows new blood vessels to grow more rapidly into the affected areas"[1].

A study at Cornell University investigated the effects of HBOT on children with CP. Like other research done in this area has suggested, it was found that after children had undergone 40 one-hour sessions of HBOT they showed "substantial improvements in motor skills, attention, language and play".[2] Dr Tasreen Alibhai suggested that this may be due to the treatment's ability to increase blood flow to the brain, which would provide it with oxygen and nutrients, thereby causing brain cells to "wake up"[3], leading to enhanced brain functioning and an improvement in symptoms. She also brought up that this therapy may bring about reduced inflammation, increased metabolism of cells and mobilised stem cells from bone marrow. A piece of research by Montgomery and colleagues (1999), found that children with spastic diplegia given 95% oxygen at 1.75 ATA once or twice daily to a total of 20 sessions, showed an average of 5.3% improvement in Gross Motor Function Measure (GMFM), better walking, as well as their parents noting improved alertness and communication. This research differs from other studies carried out as it gives a quantitative measure of improvement, whereas usually qualitative measures are used. However, unfortunately, studies which have found beneficial effects of HBOT could be criticised for not taking into consideration the possible negative consequences from the treatment. Occasionally ear problems, damage to the eardrum, blurred vision and claustrophobia can result from the therapy. Some may argue that these risks outweigh the possible benefits, and that therefore other methods of treatment should be preferred. Additionally, whilst a number of studies have found beneficial effects of HBOT, there are others which have in fact found the opposite. For instance, Chavdarov's study in 2002 found that four of those being studied suffered "adverse effects".[4]

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[1] Island Hyperbaric Center, 2009. *Frequently asked questions about HBOT.* [Online] Available at: http://www.centrehyperbare.com/en-faq.php [Accessed 2 September 2009].

[2] Alibhai, T., Hyperbaric Oxygen Therapy: New hope for cerebral palsy and autism. Health Action Magazine, [Online] Fall 2007. Available at: http://www.hans.org/magazine/249/Hyperbaric-Oxygen-Therapy-New-hope.html. [Accessed 5 September 2009]

[3] *Ibid*

[4] Neuman, Tom S., Thom, Stephen R., 2008. *Physiology and Medicine of Hyperbaric Oxygen Therapy* [e-book] Philadelphia: Elsevier Health Sciences. Available at: Google books http://books.google.com/books?id=MpfrNFAkMJUC&pg=PA12&lpg=PA12&dq=physiology+and+medicine+of+hyperbaric+oxygen+therapy&source=bl&ots=_rJbjzk6gZ&sig=e2ICzfcYUoUDWmhrZl3JW7c1LME&hl=en&ei=erHpSsSOEuHTjAearKibDQ&sa=X&oi=book_result&ct=result&resnum=4&ved=0CB4Q6AEwAw#v=onepage&q=&f=false (p.467-468). [Accessed 4 September 2009]

Machado (1989) also looked at the effects of HBOT over a ten- year period. Using a similar method to the research carried out more recently, he treated 230 children in Sao Paulo by giving them 20 sessions at 1.5 ATA daily or twice daily. He reported that there was a "clear reduction" in spasticity in 218 (94.8%) of his patients. This persisted in about 75% of those whom he followed for the next six months. As well as this, he reported that the therapy brought about an improvement in general health and attention in nearly the entire group. A criticism of these findings however, is that since only a "clear reduction"[5] was reported, there were no details of the method used to quantify exactly by how much the spasticity had decreased. This change may be seen to be subjective, and since Machado himself was the one assessing the patients, he may have been influenced by his own expectations about the effects of the treatment. Although the findings of a number of clinical studies carried out into HBOT are consistent with each other, the methodology used by the studies should also be carefully assessed. Appropriate and effective randomisation, as well as blinding all of the participants and investigators to ensure there are no demand characteristics, must be used. Without participants being randomly assigned to groups, there may be individual differences between the groups which have caused the difference, rather than the therapy itself. If these measures were not taken, the data collected may have little validity.

In addition, the Cornell study of HBOT for children with CP by Dr. Maurine Packard looked at the effects of the therapy on children between the ages of one and five with moderate to severe CP. Her findings, which were presented in 2000, stated that her research had provided evidence for HBOT improving "motor skills, attention, language and play"[6]; whilst with some of the children an increase in vision was also recorded. She carried out follow up interviews and found that changes in spasticity were most likely to fade over time, whereas the improvement in attention, language and play remained. This introduces another important consideration for CP treatments: improvements need to be maintained over time or else the individual is not benefiting long term. Many studies into treatments for CP often only look at the immediate changes observed, without assessing whether these changes still exist a few months later. If the improvements are not maintained it can cause the child and their family more harm than good, since the treatment may be giving them false hope. Parents are then forced to watch their child slowly deteriorating once the treatment period is over, causing them great psychological distress.

## Hippotherapy

Hippotherapy (HPOT) can be defined as "the use of the movement of a horse as a tool by physical therapists, occupational therapists, and speech-language pathologists to address impairments, functional limitations and disabilities in patients with neuromusculoskeletal dysfunction. This tool is used as part of an integrated treatment program to achieve functional outcomes."[7]

Bertoti (1988) investigated the effects of hippotherapy in children with CP with spastic quadriplegia and spastic diplegia, which involved assessing posture before and after hippotherapy. Like other research has suggested, the posture after treatment was significantly improved in eight out of the eleven children. Researchers believe that a walking horse can stimulate the three-dimensional movement of the human pelvis during gait. The warmth and rhythm of the horse can also result in a decrease in muscle tone, and help to promote relaxation. A study by McGibbon, Andrade, Widener

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[5] *Ibid*

[6] Chico Hyperbaric Center, 2000. *Cornell University Study*. [Online] Available at: http://www.hbotoday.com/treatment/clinical/researchstudies/cornellstudy.shtml [Accessed 3 September 2009]

[7] Miller, F & Browne, E., 2005. *Cerebral Palsy*. [e-book] Springer. Available at: http://books.google.co.uk/books?id=V_p50E-Up7IC&pg=PA811&dq=Miller,+F+%26+Browne.,+2005.+Cerebral+Palsy.+hippotherapy.#v=onepage&q=&f=false , p. 810-811 [Accessed 14 August 2009]

and Cintas (1998) also found that hippotherapy had positive effects on children with CP. They found that after an eight-week program of hippotherapy, the five children being studied showed a significant decrease in energy expenditure during walking and a significant increase in GMFM walk, run, and jump subtest. An increase in stride length and decrease in cadence whilst walking was also reported. These pieces of research could be criticised however, due to the extremely small sample size used in each of the studies. It could be argued that looking at the effects of hippotherapy on just five children is not a valid way of assessing the effectiveness of the treatment, due to the sample not necessarily being representative of all children with CP, which could mean the findings are not generalisable.

Casady and Nichols-Larsen (2004) investigated further the effects of hippotherapy on children with cerebral palsy. Their research differed from other research as in this study, in addition to using GMFM as a way of measuring performance; the Pediatric Evaluation of Disability Inventory (PEDI) was also used. The PEDI is used to measure a child's functional performance in the home and community in the areas of self-care skills, mobility, and social function. After the hippotherapy phase there improvements in PEDI total score, PEDI social score, and GMFM total score were found, together with improvements in GMFM crawling/kneeling subtest scores, whereas during the no-treatment phase of the study there were no changes in function. An important issue is that the effects of treatment should include benefits to the individual's everyday life, and not just an improvement in motor skills. A very small improvement in motor skills may not necessarily always improve the child's quality of life, and this is what the majority of the studies carried out have focused on. When evaluating treatment in terms of its effectiveness, maybe we should instead look at changes in the child's functional performance, to ensure that the treatment really is of benefit to the child.

Benda, McGibbon and Grant (2003) found that children treated with hippotherapy showed improvements in their postural control and symmetry of muscle activity. The control group that sat astride a stationary barrel showed no significant change, indicating that these positive changes were due to the treatment. The use of a control group was important in this study, as without it, it would have been unclear whether the movement of the horse caused the improvement, or whether it was another factor, such as the children naturally improving due to believing that the treatment would help them, known as the placebo effect.

Another important consideration in terms of hippotherapy is whether the beneficial effects from the treatment will be maintained after the therapy is discontinued. Winchester, Kendall, Peters, Sears and Winkley (2002) investigated this. "Significant improvements in gross motor function were found and maintained seven weeks after the program ended"[8], although they found no improvements in walking speed. However, only seven children were used in the study, making this an extremely small and possibly unrepresentative sample. Also, a few studies, such as the study done by MacKinnon and colleagues, found that there were "no significant effects in the majority of outcome measures"[9], demonstrating that research evidence into hippotherapy is not completely conclusive. In addition to this, many of the studies into hippotherapy have been criticised since it has been claimed that they "fail to provide a comprehensive picture of the effects of hippotherapy"[10]. Scientists have failed to find ways to measure the impact of hippotherapy in an objective way, so findings from studies into this treatment are somewhat limited. Unfortunately, as a result of this, many insurance policies do not cover this treatment, leading to parents having to pay large sums of money for their child to receive the therapy.

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[8] Burton, G., 2005. *Use of hippotherapy with children who have cerebral palsy.* [Online] Boyer children's clinic. Available at: www.boyercc.org/docs/print/EBP_Cerebral_Palsy.doc *[Accessed 15 August 2009]*

[9] Blue Cross of Idaho, 2009. *Hippotherapy.* [Online] Available at: https://www.bcidaho.com/providers/medical_policies/the/mp_80312.asp [Accessed 15 August 2009]

[10] Debuse D, Gibb C, Chandler C, 2009. *CP Research News.* [Online] Cerebral Palsy Institute. Available at: http://www.cpinstitute.com.au/research/cpresearchnews_090427.pdf [Accessed 15 August 2009]

Although research findings suggest that hippotherapy can bring about improvements in children with CP, there is the argument that the treatment is not entirely safe for the child, due to the possibility of the child falling off the horse. However, Nicholas Coyne, EquiTherapy manager and owner of a hippotherapy centre's twelve horses claims that there have been "plenty of riders fall or get hurt on the able-bodied side of this stable, but none on the therapy side"[11]. Horses are carefully selected to ensure that they are suitable for the patient concerned, to ensure that the treatment is as safe as possible. Although his comments may be based on a desire to assure parents that the treatment is safe, I believe that the risks associated with hippotherapy are minimal, and that if the treatment is right for the individual, hippotherapy should be given. Also, children with CP tend to enjoy sitting on a horse, particularly if they are used to being hospitalised for long periods. The treatment motivates them, since the child enjoys the experience, and barely realises that they are actually working to improve skills such as balance and coordination. The child's enjoyment of the treatment is another factor rarely considered, and I think that this is extremely important, as without enjoying the treatment and looking forward to sessions, the child may be suffering as a consequence, even if it does bring about an improvement in motor skills. Suffering from CP must be hard enough already for the child, without them having to suffer unenjoyable and unstimulating treatment as well.

## Suit therapy

There are various types of suits available on the market, such as the TheraSuit and Adeli suit. A similar suit had originally been developed by the Russian space program in order to combat the adverse effects of weightlessness. The suit allows children to "gain better control over their muscles by restricting movement of the muscles and strengthens muscles by providing controlled resistance to muscle movement"[12].

Research carried out by Euromed (a private clinic specialising in the use of the Adeli suit) on 620 patients found that there was an improvement in 604 cases, when the Adeli suit treatment had been administered. Of these cases with improvements, 196 experienced a small improvement, 312 had intermediate improvement, and 112 showed a large improvement. After the treatment more patients were also able to walk. These findings contrast with those of other research in which the findings were inconclusive, as no evidence either in support of or against the use of suit therapy was found. Euromed suggested that this improvement was due to the treatment stimulating the restarting of the development process of the vestibular system, which combines all other functional systems of the body, and aids balance and coordination. It's believed that this development in turn brings about postnatal development of the central nervous system, resulting in the normalisation of motor development, speech, and cognitive development. Findings also suggested that suit therapy can cause an increase in speech fluency in CP patients, signifying that an improvement in the patient's quality of life would be brought about, since walking and speech are major difficulties associated with the condition. However, this research was undertaken by a clinic specialising in the treatment, rather than an independent organisation. This means that the findings may be lacking in validity, as it is was in the clinic's own interests to come up with findings that support the use of their treatment. It is unclear exactly how the improvement was measured, meaning that the data could have been relying on parents' observations. If they knew their child was being given the treatment they may have been expecting the child to make improvements and consequently falsely reported an

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[11] American Hippotherapy Association, 2007. *Horse power: When riding turns into treatment.* [Online] Available at: http://www.americanhippotherapyassociation.org/aha_hpot_a_horsepower.htm [Accessed 14 August 2009]

[12] Bursztyn, A., 2007. *Praeger Handbook of Special Education* [e-book]. Greenwood Publishing Group. Available at: http://books.google.com/books?id=BosLzxdlEdgC&pg=PA71&lpg=PA71&dq=praeger+handbook+of+special+education+suit+therapy&source=bl&ots=xqtaPfwAqd&sig=LU-D17JoOMIpO_zjsPG_doxTIwg&hl=en&ei=XsLpSunRC9ygjAej5ZSUDQ&sa=X&oi=book_result&ct=result&resnum=1&ved=0CA0Q6AEwAA#v=onepage&q=&f=false (p.71-72) [Accessed 13 August 2009]

improvement. Alternatively, it could have been the researcher measuring the improvement, and since they would have known the aim of the investigation, may have reported improvements even though in reality they didn't actually exist. Although a very large sample was used for the research, I still believe that these findings may be unreliable, due to the existence of potential benefits for the clinic for finding that the treatment brought about an improvement, in terms of great financial and professional gains.

A pilot test was performed in 1997 by investigators at the University of Minnesota. This study involved treating six children and adults who either suffered from CP or were stroke victims, over a period of three weeks. Conclusions were that the treatment was successful and that although the Adeli suit treatment program is "very intensive and concentrated", "in the long run, it may prove to be highly cost-effective"[13]. The findings from this study vary from other research carried out in the area, since the study measured the effectiveness of the treatment in terms of cost-effectiveness, which differs from most other research carried out which tends to use motor skills and speech as ways of measuring the success of the treatment. This brings up a very important issue associated with CP treatments: they can be extremely costly to families if they are forced to fund the treatment themselves, and so cost-effectiveness comparisons should be made between different treatments, to ensure that cheaper and as effective options are not available. Suit therapy, in particular, is a very expensive treatment, especially since many insurance companies do not cover it in their policies, putting a great financial burden on the child's family.

Dr. Edward Dabrowski at the Children's Hospital of Michigan investigated the effectiveness of the Adeli suit on children with disabilities. He used 57 children who all received an hour of physical, occupational and speech therapy three times a week for eight to ten weeks followed by a four-week home program. The Adeli Suit was worn for the last four weeks of the therapy program by the children in the experimental group. It was found that both groups showed improvements and sustained this, without there being any statistical difference in results between the two groups. These findings suggest that periods of intensive therapy can lead to improvement; however there was nothing to suggest that use of the Adeli Suit helped in any way. This implies that the effect of the Adeli Suit is only likely to be very minor, and not big enough to be a significant change. It could also be argued that whilst 57 is not such a tiny sample, it still may be too small to produce generalisable findings. Some other factor, such as another treatment experienced, may have interfered with the use of the Adeli Suit, causing there to be no benefit from it. I believe it is clear from my research into this therapy that there is no conclusive evidence to suggest that there are beneficial effects from suit therapy. However, the majority of the research has been carried out into the Adeli Suit, and not into a number of other variations of the suit available on the market. These may be found to be more effective and beneficial to CP patients, if these were investigated to a similar degree to which the Adeli Suit has been.

## Robotic therapy

In this therapy a robotic device is used to help a person learn to control their arms and legs. The person's limb is gently guided at the same time as when they attempt to make a specific movement. Originally, this therapy was created for the treatment of stroke patients; however since then it has been introduced to help CP sufferers, as well as for other conditions, such as multiple sclerosis, Parkinson's disease and spinal cord injury.

In a similar way to the research of Kahn et al (2006), three published pilot studies, involving a total of 36 children, produced results which suggest that children with CP can benefit from robotic therapy.

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[13] Finch, L, 2003. *New hope for children with CP.* [Online] The Interdisciplinary Journal of Rehabilitation. Available at: http://www.walkeasy.com/learn/news/new_hope.pdf [Accessed 13 August 2009]

Findings indicated that the therapy helped the children "reduce impairment and improve the smoothness and speed of their reaching motions"[14]. Robotic devices are all based on the same idea that there is a possibility of helping to "rebuild brain connections"[15]. Hermano Igo Krebs, a principle research scientist in mechanical engineering and one of the leaders of MIT (a company specialising in testing robotic devices for movement disorders), also brings up that it's particularly suited for children with CP, due to children's developing brains being more plastic than adults', making them "more able to establish new connections"[16]. An argument against the use of this therapy, however, is that a very large number of repetitions are required for the treatment to be successful, with at least 400 needed in any one hour-long session, as this "encourages structural and functional changes in the nervous system."[17] I see would suspect that this would make the treatment repetitive and unstimulating for the child, therefore meaning that the child may be lacking in the motivational skills needed to make the treatment a success. However, research evidence contrasts greatly with this view, since in an early study done in Europe, "the therapy was rated "excellent" in providing motivation for carrying out the therapy among a majority of children"[18]. I find this finding surprising; although it could be argued that the children were probably only studied for a short period of time, meaning that they were probably more enthusiastic about the treatment than they would be after using the therapy for a number of years. The rigidity of robotic control movement may also result in the gait being less normal, than is found with other treatment methods.

Another study into the effectiveness of robotic therapy for stroke patients was done more recently. Steven Cramer, a neurologist at the University of California, Irvine, "carried out a study in which 13 people who had suffered a stroke at least three months before, and so were past the time when they were likely to experience spontaneous recovery, received 15 two-hour sessions with Howard over three weeks"[19]. Howard is a prototype device, otherwise known as the Hand-Wrist Assisting Robotic Device, which assists people in regaining the ability to grasp and release objects. Findings from the study suggested that after this trial period, the participants' ability to carry out real-life tasks, such as gripping a glass or picking up a phone, had "improved by almost ten per cent"[20]. Cramer claims this was due to the robot "instructing the motor cortex in how the movement should go", through actively helping the patient to complete the movement. Additionally, it was found that there was a 20 per cent improvement in patients, in a test of manual dexterity, in a task that involved moving blocks from one side to another inside a box. An improvement in manual dexterity is likely to have a positive impact on a CP patient's life, allowing them greater freedom and independence, as well as reducing the need for them to depend on others for their own personal care. Therefore, these findings could have important implications for not only CP sufferers, but their loved ones caring for them on a daily basis. Although this study produced significant findings, a criticism is that the research was only done with stroke patients. It may not therefore be possible to make assumptions about its effectiveness for treating CP, based on these findings, due to CP being a completely different condition, even if there are similarities between them. Robotic therapy may not influence

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[14] Science Daily, 2009. *Robotic Therapy Holds Promise For Cerebral Palsy.* [Online] (Updated May 21, 2009) Available at: http://www.sciencedaily.com/releases/2009/05/090520161335.htm [Accessed 11 August 2009]

[15] *Ibid*

[16] *Ibid*

[17] Hocoma, (unknown year). *Therapy information- Lokomat training for stroke patients.* [Online] Available at: https://hocoma.picturepark.com/Website/Download.aspx?Purpose=AssetManager&Random=343f9b9f-b9c3-4420-9a80-f3c1d9a506c2&RelativeDownloadPath=\181009\7v6x8mnx\1ynw9vr2\Therapy_Info_CP_0705_de_en.pdf&mime-type=application/pdf [Accessed 11 August 2009]

[18] Rehabilitation Institute of Chicago, 2009. *Robot-assisted walking therapy holds promise to help maximise abilities of the 10,000 children born each year in the U.S. with cerebral palsy.* [Online] (Updated March 19,2009) Available at: http://www.ric.org/aboutus/mediacenter/press/2009/0319.aspx [Accessed 11 August 2009]

[19] Young, Emma., 2007. Tireless, reliable physio-robots take on stroke paralysis. *New Scientist.* [Online] Issue 2598. Available at: http://www.newscientist.com/article/mg19425981.100-tireless-reliable-physiorobots-take-on-stroke-paralysis.html?full=true [Accessed 10 August 2009]

[20] *Ibid*

CP sufferers in the same way as stroke patients. Unfortunately, only a very limited number of studies have been done into the effectiveness of robotic therapy for CP, due to the use of the treatment for treating CP being only a very recent scientific development.

Another issue associated with robotic therapy which must be considered is that physiotherapists could find themselves no longer required for treating patients, since the robots would take their place. However, it must be remembered that physiotherapists also offer emotional help and support to families, which will never be given by robotic devices. If robots were used more to help with movement training, this would instead mean that the therapists could have more time and freedom to concentrate on educating patients on how to live with their disability, as well as how they should manage pain. In the future it may be possible for CP patients to "have access to entire "gyms" of therapeutic robots, each for a different part of the body"[21], which would change the way that CP and other movement disabilities are treated. This change could only improve the lives of those suffering from the condition, enabling them to practise "coordinated and physically demanding movements such as climbing stairs"[22], in a way which is not currently possible.

## Physical therapy

"The goal of physical therapy is to identify and treat problems with movement and posture, or body position"[23]. A physical therapist works with children to help them develop their motor skills to the maximum extent possible. For infants with CP, as with other motor disorders, neurodevelopmental treatment (NDT) is often used. This treatment, also known as Bobath physiotherapy, seeks to remove the infant reflexes which persist in a child with CP, which would normally disappear in a child without the condition. The treatment programme consists of the child being positioned passively in postures that reduce spasticity. The normal stages of development are brought about, allowing the child to progress from rolling to walking. A physical therapist can also assist the child with learning to use crutches, braces, splints or a wheelchair if necessary.

Palmer et al (1988) investigated the effects of physical therapy on CP, comparing two early intervention programs. One group were given NDT, whilst the other experienced a published infant stimulation program called Learningames. Findings suggested that "there was no motor, cognitive, or social advantage for infants receiving physical therapy after six and twelve months of treatment, and that trends favoured the infant stimulation program."[24] However, since the study used a sample of only 48 infants, the findings may not be generalisable. It is acknowledged by the researchers that further research is needed before any real conclusions can be made about the effectiveness of physical therapy. The research also didn't consider the long-term benefits from the two treatments, and so it may be that physical therapy has more long-term benefits than the infant stimulation. The standard of the physical therapy received by the children is another issue that may have lead to it appearing ineffective in the study, as the better the quality of physical therapy received, the more likely the treatment is to have beneficial effects on patients.

Kluzik, Fetters and Coryell found contrasting findings, however. They investigated the effects of neurodevelopmental treatment (NDT) on reaching in children with spastic quadriplegia (a form of CP). The WATSMART™ (Waterloo Spatial Motion Analysis and Recording Technique) system was used to record hand position in three-dimensional space during a simple reaching task, along with using videotaping. Each participant performed several reaches before and after one treatment session. It was found that "following treatment, reaches were significantly faster, smoother, and more

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[21] *Ibid*

[22] *Ibid*

[23] Geralis, E. & Ritter, T., 1991. *Children with cerebral palsy- A parents' guide*. United States of America: Woodbine House, Inc.

[24] NCPAD, 2007. *A brief history of therapy in the treatment of cerebral palsy*. [Online] Available at: http://www.ncpad.org/disability/fact_sheet.php?sheet=119&section=954 [Accessed 8 September 2009]

mature"[25]. This suggests that the effects of NDT are immediate and only require one treatment session to take effect. The findings demonstrate that NDT can have positive outcomes in patients with CP. It must be remembered, however, that only one type of CP was looked at, and so more different types would also need to be investigated, in order to be able to make assumptions about other types of the condition, since different types of CP can have very different symptoms.

Fetters and Kluzik's study supported the use of NDT, although it raised the issue that it may be needed in combination with another treatment, since in their study it was found that NDT needed to be used together with practice of reaching tasks, for movement time to show improvement. This finding suggests that the use of just one isolated treatment will have little effect and that for improvements to be made, a number of treatments need to be used. A difficulty associated with this however, is that it places greater strain on the child's family, both physically and financially, even if it does bring about greater benefit for the child. A great deal of commitment and motivation would be required by the child's family, in order for such a demanding treatment schedule to be maintained.

A meta-analysis performed by Ottenbacher et al (1986) reviewed a number of studies into the effects of treatment on children with developmental disabilities or delay. In nine of the studies, that met the criteria set by researchers, a "greater improvement in the motor area was found in children who had received treatment that utilised NDT techniques in comparison with control subjects"[26]. A strength of this finding is that since a meta-analysis was used, research carried out by different researchers is taken into account, reducing the chances of researcher bias influencing the findings. In this particular one, there was a series of criteria set to ensure validity of findings, one of these criteria being that statistical tests had to be sufficient to work out an effect size between treatment and no treatment. It must be remembered, however, that although this meta analysis found positive effects of NDT, these effects were still only small, meaning that there is still an element of doubt over whether NDT benefits patients.

## Conclusion

From my research I would conclude that a combination of different therapies will bring about the greatest benefits. HBOT has been shown to be effective; however there may also be possible side effects from the treatment. Hippotherapy use has also been supported by research and is seen as enjoyable by most children, whilst the risk involved I believe is only very small. After considering the evidence, I would suggest that suit therapy does not have enough evidence to support its use, and therefore that another treatment should be preferred in most cases. Robotic therapy is a newly developed therapy for CP and is consequently lacking in research evidence to support the use of the treatment, however I realise that this therapy is likely to become more widely used in the future. Physical therapy is the most commonly used therapy and plays a major part in the lives of children with CP. It is particularly effective when used in combination with another treatment. More evidence is needed however, to investigate the effectiveness of NDT.

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[25] Physical therapy, 1990. *Quantification of control: A preliminary study of effects in neurodevelopmental treatment on reaching in children with spastic cerebral palsy*. [Online] Available at: http://www.physicaltherapyonline.org/cgi/content/abstract/70/2/65 [Accessed 9 September 2009]

[26] Fetters,L., Kluzik,J., 1996. The effects of neurodevelopmental treatment versus practice on the reaching of children with spastic cerebral palsy. Physical therapy, [Online]. 76.n4 (April 1996): p.p346(13). Available at: http://find.galegroup.com/gps/retrieve.do?contentSet=IAC-Documents&resultListType=RESULT_LIST&qrySerId=Locale%28en%2C%2C%29%3AFQE%3D%28ke%2CNone%2C40%29effectiveness+of+physical+therapy+for+CP%24&sgHitCountType=None&inPS=true&sort=DateDescend&searchType=BasicSearchForm&tabID=T002&prodId=IPS&searchId=R1&currentPosition=1&userGroupName=hillsr&docId=A18269335&docType=IAC&contentSet=IAC-Documents [Accessed 10 September 2009]

5200 words

## Glossary

*ATA*- Stands for atmosphere absolute. 1 ATA is equal to the atmospheric pressure at sea level. It can be measured using a barometer.

*Braces*- A form of support that steadies or strengthens something.

*Cadence*- The beat, rate, or measure of any rhythmic movement.

*Claustrophobia*- An abnormal fear of being in an enclosed or confined space.

*Demand characteristics*- May occur in an experimental procedure where participants guess the aim of the experiment and unconsciously change their behaviour accordingly.

*Functional limitations*- Weaknesses of an individual that lead to them being unable to function in a particular environment.

*Gait*- A pattern of walking or locomotion.

*Gross Motor Function Measure (GMFM)* - An evaluative measure of motor function designed for measuring change in the gross motor abilities of children with cerebral palsy.

*Inflammation*- The reaction of the body to tissue injury or infection, characterised by reddening, pain, swelling and warmth, due to increased blood flow in the traumatised area.

*Manual dexterity*- Involves the coordination of small muscle movements of the hands and fingers.

*Meta- analysis*- Combines the results of several studies that address a set of related research hypotheses.

*Metabolism*- The set of chemical reactions that occur in living organisms which allow life to be maintained. Metabolic processes allow organisms to grow and reproduce, maintain their structures, and respond to their environments.

*Motor cortex*- Regions of the cerebral cortex (a structure within the brain) involved with involuntary muscle movements.

*Neuromusculoskeletal*- Describes the interactions between nerves, muscle and the skeleton.

*Postural control*- The ability to sustain the necessary background posture to efficiently carry out a skilled task, such as reading or handwriting. It involves having the ability to stabilise the trunk and neck.

*Spastic diplegia*- A form of cerebral palsy in which the legs are mainly affected, involving abnormal stiffness.

*Spastic quadriplegia*- A form of cerebral palsy in which all four limbs are affected, and in which the whole body is affected, including the face, arms, trunk and legs. The legs and feet are generally more badly affected than the arms and hands. It involves abnormal stiffness.

*Splints*- Devices for preventing movement of a joint or holding in place any part of the body.

*Spontaneous recovery*- The recovery that occurs as damaged body tissues heal. It would occur with or without rehabilitation.

*Vestibular system*- The system in the body which is responsible for maintaining the body's orientation in space, balance and posture.

*Weightlessness*- A phenomenon experienced by people during free-fall. It typically occurs when an object or person is falling freely, in orbit and in several other unusual situations.

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of+hyperbaric+oxygen+therapy&source=bl&ots=_rJbjzk6gZ&sig=e2ICzfcYUoUDWmhrZl3JW7c1LME&hl=en&ei=erHpSsSOEuHTjAearKibDQ&sa=X&oi=book_result&ct=result&resnum=4&ved=0CB4Q6AEwAw#v=onepage&q=&f=false (p.467-468). [Accessed 4 September 2009]

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# Personal Action Plan

| Week commencing | What have you achieved this week? | Any problems? | Successes | What do you need to do next? | Notes |
|---|---|---|---|---|---|
| 22nd June 09 | I came up with a topic for my project to be on. I attended a lunchtime talk on planning for EP. | I found that it was difficult creating a suitable question for my project title. | I did some research to look for sources that may be helpful. I found several internet sites and books that looked relevant to my project. | Meet with mentor and discuss topic title and discuss any possible improvements to it. Also I need to continue to search for research sources. | |
| 29th June 09 | After my meeting with my mentor, I have altered my title slightly to make it more specific. I have also discussed my project with the college librarian and was given a website for the Anglia Ruskin library, as well as an email address to contact Addenbrookes hospital about using their library facilities for my project. I attended a lunchtime talk on using the internet and e-resources, as well as another on research resources in Cambridge. | Found that my project title was not specific enough and needed improvement. | I have found some possible libraries to source books for my project from. I have also completed my VTT and have handed it in to my mentor. | I need to search the internet for websites which may be useful for my research. In addition to this, I am going to visit the Anglia Ruskin library to search for books on cerebral palsy (CP). | |
| 6th July 09 | Carried out some research into cerebral palsy. I visited the Anglia Ruskin library and found a very useful book which discussed a wide range of aspects of cerebral palsy. I also researched on the internet and found websites that contained detailed information about CP, in particular, risk factors for the condition. I also emailed Addenbrookes in connection with using the Clinical School library for my project. I attended a talk at college on independent learning. | Had difficulty locating books in the Anglia Ruskin library and so asked a librarian for help. Also, I found from researching online that the local libraries in the area do not stock any books relevant to my research. This means that for a lot of my research I will have to rely on internet sources. | I now have a basic knowledge and better understanding of what cerebral palsy is, and found other important information about the condition. | Continue my research on CP. I am going to revisit the Anglia Ruskin library to look for more books that may be useful for my project. | Was on the Biology field course from Tuesday to Thursday.<br><br>I ordered a book from Amazon about cerebral palsy. |
| 13th July 09 | The book which I ordered from Amazon arrived, ready for me to take it on holiday next week. I read the first chapter | Received an email from Addenbrookes stating that I will not be allowed to use the library facilities there due to being | Have further increased my knowledge of CP. I learned more about the treatment of the condition, as well as problems that | Read the book 'Children with Cerebral Palsy' by Archie Hinchcliffe, whilst on holiday. | |

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| | to give me an overview of the condition. Revisited the Anglia Ruskin library, where I finished making notes from a book I used previously. I also found another book containing a useful paragraph about services for people with CP and the problems associated with this. | under 18. If I wish to use the library I will therefore have to wait until after my birthday in October, however by this point I hope that I will have finished my research anyway. | arise with the services on offer to sufferers. | | |
| 20th July 09 | Read most of the book 'Children with Cerebral Palsy by Archie Hinchcliffe'. Learned about the principles of treatment for CP, eating and drinking difficulties, equipment used, as well as the relationship between the child, family and therapist. | Found that lots of the detail describing physiotherapy treatment was very complicated and difficult to understand. | Have a better understanding of the work of a physiotherapist when treating a child with CP. Have learned the importance of cooperation between the therapist and the family. | Make notes from the first chapter of the book to allow me to gain further information on the condition, which I can use in my dissertation. Use the internet to continue my research, using websites such as *Google Books*. | In Spain on holiday |
| 27th July 09 | Finished reading book and made notes from chapter 1 about what CP is. Used *Google books* to make notes from various books giving general information about CP. | Decided that my original project title would not be viable due to the information on physiotherapy techniques for CP being too difficult to understand. Had difficulty coming up with something new to investigate, in addition to what CP is (which I have already looked at). | Found *Google books* to be very helpful as it allowed me to view lots of useful books, without needing to buy them, which would be very costly. | I need to decide on an improved project title, as well as continuing with my research, perhaps using film clips from the internet as another possible source. Review research diary for my project so far. | |
| 3rd August 09 | Ensured that my research diary for my project so far was up- to-date. Used the internet to find video and radio clips to listen to on the topic of cerebral palsy. Decided that the rest of my project will be on the treatments and therapies available to children with CP. | Had difficulty deciding on what else I should investigate in my project. I originally thought that I would like to look at the relationship between the therapist, family and the child, however decided that there was not enough information about this. I therefore decided to investigate therapies and treatments for CP instead, as I found lots of detailed information on this subject. | I now have a better understanding of what it is like for the families of children with CP, after listening to Phil Neville (who has a daughter with CP) talking about his family life. I also now have a clearer idea about where my project is heading, due to deciding on a topic to investigate for the rest of my project. | Begin researching and making notes about treatments and therapies for CP. I also need to order another book off Amazon to take to read on holiday. | |
| 10th August 09 | Researched robotic therapy and suit therapy as forms of therapy for CP patients. Also, began looking at hippotherapy. | I found that there was a lot of websites about the therapies. It was difficult to decide which websites would be the most reliable. In order to do this I looked for information about the website and who it was | Found that there was a great deal of information available on the internet about therapies for CP. Was able to collect research from a range of sources, such as *Google books*, *Google scholar*, as well as a number of other | I need to finish researching hippotherapy, before moving on to look at some other therapies and treatments for CP. | I ordered another book off Amazon- it is a book about CP aimed mainly at parents with a child with CP. |

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| | | produced by, to ensure that it was likely to be a reliable information source. | websites. | | |
| 17th August 09 | Completed research into hippotherapy. I then moved on to look at electrical stimulation for CP patients. | Found that researching electrical stimulation was not as simple as first thought. I need to be careful that I don't get the 3 different types of electrical stimulation confused. | Now have some understanding of what electrical stimulation actually is and how it can be used as a treatment for CP. I am aware that there is more than one type of electrical stimulation. | Whilst on holiday, begin reading 'Children with Cerebral Palsy: A Parents' Guide'. Make notes from pages that are relevant to my areas of research. | Book arrived which I ordered off Amazon. I will take this to read in Derbyshire. |
| 24th August 09 | Read the first 4 chapters of my book. I made notes from the first chapter, which was about what cerebral palsy is, since I felt that this would further increase my understanding of CP, and was particularly relevant to my research. | Had difficulty deciding which sections of the book I needed to take notes from. In the end I decided that the chapter 'What is Cerebral Palsy?' was the only chapter from the first four that I have read which I needed notes from. This is due to the fact that although the rest of the information is very interesting, my specific project title only looks at what CP is and the treatments and therapies available, so I must be careful only to focus on my title. This will stop me losing sight of the aim of my project. | I found that the book which I bought off Amazon was of great use to me for my research. As well as describing what cerebral palsy is, the book also contains personal insights from parents with a child with CP. This has given me a better understanding of what it is really like being a parent of a child with CP and the difficulties that they face. | Look at hyperbaric oxygen therapy (HBOT), as well as finish reading the book which I began reading whilst on holiday. | In Derbyshire on holiday |
| 31st August 09 | I researched hyperbaric oxygen therapy and looked at how it can be used to help children with CP. I also finished reading 'Children with cerebral palsy- A parents' guide'. | Had originally planned to research botox therapy as well this week. However looking at HBO therapy took longer than planned, due to the fact that I wanted to ensure that I researched the topic thoroughly. Therefore I decided not to look at botox therapy. | I now understand how hyperbaric oxygen therapy works. I have also finished reading my book, which has given me a basic knowledge of the condition, its therapies and treatments, and legal matters needed to be considered by parents of a child with CP. | Research how physical therapy, occupational therapy, and speech and language therapy can help children with CP. | Go back to college on Tuesday 8th. |
| 7th September 09 | This week I have done research into physical therapy and how it can be used to help children suffering from CP. I have also found some research studies carried out into the effectiveness of physical therapy treatment on children with CP. | Originally this week I had planned to look at physical therapy, occupational therapy, and speech and language therapy. However I have realised that this was over-ambitious, and so have instead decided to concentrate on just looking at physical therapy, since this is the area which is of most interest to me. Unfortunately now that I am back at college I will have less | I now realise the difficulties associated with studies into the effectiveness of physical therapy, due to it being difficult to control other variables which may have been causing an improvement in patients, rather than the treatment itself. | I am going to begin writing up my final 5000 word dissertation. I hope to get my first draft of it completed early, in order to leave myself plenty of time to make the necessary alterations to it before handing it in. | |

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| | | time for doing research for my project. | | | |
| 14th September 09 | This week I have begun writing up my dissertation. I have finished the first section on the condition CP. | Had problems structuring my dissertation. After attending my weekly session with my mentor I have now learned how to create headings in Microsoft Word, and use them to structure my dissertation. | I have completed a first draft of the first section of my dissertation on the topic of what cerebral palsy actually is. | I need to start writing up the section of my dissertation on how cerebral palsy is treated in children. This section will take more time as it will be longer, and will contain much more analytical content than in the first section. | |
| 21st September 09 | I wrote and handed in my 500 word summary of my research done so far. Began writing up section of dissertation on hyperbaric oxygen therapy (HBOT). | Decided that the section which I had originally planned to include in my dissertation on what the condition cerebral palsy actually is, does not meet the analytical criteria of the project, and therefore will need to be omitted to create room for more analysis of the treatment options for sufferers. Unfortunately, this means that I have spent a great deal of time doing research that I will not use in my final dissertation, even though it has improved my knowledge of the condition. If I was to do the project again I would not spend as much time researching CP. | In writing my 500 word summary I have had the chance to review my work done so far, and this has brought up some aspects of my project which I feel need some improvement. Analytical content, using research studies, is an important aspect of the project, and so is one that I must be careful to include. | I intend to complete my first draft of the section on HBOT, before then moving on to write up about hippotherapy treatment. | |
| 28th September 09 | Completed first draft of section of dissertation on HBOT. I also wrote the section about hippotherapy. | Found that there was a lot of information on studies into hippotherapy and therefore needed to carefully select studies for use in my dissertation, to ensure that it wouldn't be too long. | I think that my dissertation so far carefully follows the connect-extend-challenge idea suggested. I have done a great deal of analysis of the research findings. | I am going to write further sections of my dissertation on suit therapy and robotic therapy. Try to find some more information about robotic therapy. | |
| 5th October 09 | Attended lunchtime seminar on writing up the project. Wrote sections about suit therapy and robotic therapy. Also, I did further research using InfoTrac on the college computers. | I found that lots of the information about robotic therapy was based on one particular article, which could be found on a number of different websites. Also, only a few research studies have been done into robotic therapy for CP, due to it being a new treatment, making it difficult to find information about it. | Found two more useful sources: one on physical therapy and the other on robotic therapy, when looking on InfoTrac at college. This extra information will provide me with more research evidence into the effectiveness of the treatments for children with CP. | I will write the final section of my dissertation on the effectiveness of physical therapy, and add in an introduction and conclusion. | |
| 12th October 09 | Wrote final section of dissertation on physical | I found that physical therapy is a very broad subject area, and | I now have a complete first draft of my dissertation. I have plenty of | I will go through and review my dissertation. This will involve | |

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| | therapy effectiveness, as well as adding in an introduction and conclusion. In my lesson I gave a presentation to the other members of my group on my project so far. | that there would be too much information to look at all aspects of the therapy. Therefore I had to decide that I would only look at neurodevelopmental therapy (NDT). I had also planned to write about electrical stimulation, however I now realise that there will not be enough room in my 5000 word dissertation. | time to make improvements to it, before handing it in to be marked. I explained to the rest of my EP group exactly what my project is about and how I have conducted my research. | making the necessary improvements to ensure that my dissertation is as good as I can possibly make it. | |
| 19th October 09 | Reviewed my first draft of my dissertation, making the necessary alterations and improvements as I went along. | Found that some of the sentences that I had written were slightly unclear and confusing, however knowing how to word them much more clearly was something I found difficult. I asked a friend to read the necessary sections, so that they could offer me guidance. | I now have a greatly improved dissertation, in which many of the points have been explained much more clearly, making it easier for the reader to understand the arguments being portrayed. | My dissertation now needs shortening down and making more concise, so that it is only 5000 words long (including the footnotes and bibliography), as at the moment it is currently over 500 words over the limit. | Met with mentor to discuss some aspects of my project which I was having difficulty with. |
| 26th October 09 | Made the final changes to my dissertation, including another slight change to the title. I also compiled a glossary for my project, as well as a bibliography. My dissertation is now short enough to hand in. | Found it incredibly difficult shortening down my dissertation, as I felt that all of the information was very relevant to my project title. Unfortunately, with the footnotes being part of the word count, this takes up a great deal of the available words. However, in the end I had to cut out information from the sections on robotic therapy and hippotherapy, as these sections were much longer than the others. | My dissertation is now much more balanced in the information it contains. Each of the sections on a particular treatment are now very similar in length to ensure that each one is evaluated to the same degree for its effectiveness in children with CP. It is also an acceptable length for handing in. | Finally, I need to complete my PPR. I also need to fill in the EP evidence sheet which I must hand in with my project to provide evidence of particular skills developed throughout the project. I am going to write a glossary including a few terms that I have used in my dissertation, so as to make it easier to understand. | |
| 2nd November 09 | Updated PPR. Filled in the necessary evidence sheet which must be handed in with my completed project. Wrote a glossary with some terms used in my dissertation. Now I have a complete bibliography giving details of all the sources that I have used throughout my project. | Had difficulty deciding on which words to include in my glossary. Had to get someone else to read my dissertation so that they could give me an idea of how easy it is to understand for someone without knowledge of the subject. | I have now completed my dissertation, filled in all the necessary paperwork and have a project that is ready to hand in. | | Deadline for handing in on Friday 6th |

OCR
RECOGNISING ACHIEVEMENT

# Project Progression Record

**Level 3 Line of learning** (when taken as part of a Diploma)_____

**Centre Name** _____ _____ **Centre Number**___ _____

**Learner name** _____ _____ **Learner Number**___**3211**_____

The topic chosen must allow the learner

- to be fairly assessed at the standard applicable to the Project level (level 1, 2 or 3).
- the opportunity to meet comparable demands to those made on other learners working at the same level
- to meet all of the Learning Outcomes and Assessment Objectives of the Project.

| Activity | Date | Detail | Supervisor's initials | Comments |
|---|---|---|---|---|
| Start date | 15 June 09 | Attended introductory session on the Extended Project. | | |

| Activity | Date | Detail | Supervisor's initials | Comments |
|---|---|---|---|---|
| Topic/working title | 22nd June 09<br><br>1st July 09<br><br>3rd August 09 | Decided that for my project I would like to look at the condition cerebral palsy, how it affects children with it, as well as how a physiotherapist can help children with the condition.<br><br>After my initial meeting with my mentor I decided that my chosen title was too broad and unclear, and therefore needed making more specific. I have decided on 2 different areas to focus my project on. I hope to look at what cerebral palsy is, and also the physiotherapy techniques which can be used to help sufferers.<br><br>After I have finished researching cerebral palsy I now hope to look at treatments and therapies for the condition, instead of physiotherapy techniques which I found to be too complicated to understand, when carrying out my initial research. | | |
| If completing the Diploma,<br>• is topic relevant to Principal Learning?<br>If yes<br>• Does the project complement and develop the themes and topics for learners' principal learning set out in the relevant line of learning criteria?<br>**and/or**<br>• does it support learner progression (skills, knowledge, understanding?) | | N/A. I am undertaking the Extended Project as a stand-alone qualification. | | |

| Activity | Date | Detail | Supervisor's initials | Comments |
|---|---|---|---|---|
| Question, task, brief or commission identified | 22nd June 09 | Decided on a title for my project: 'How does physiotherapy make a difference to the lives of children with cerebral palsy?' | | |
| | 29th June 09 | After discussing my project with my mentor, I have decided that I would like to focus on what cerebral palsy is, and the physiotherapy techniques used to treat the condition (as my first title was not specific enough). We discussed possible sources for collecting my research from, and it was suggested that I should go and speak to the librarian about using the Anglia Ruskin library. I have come up with a project title of 'What is cerebral palsy and what physiotherapy techniques are used to improve the lives of children suffering from it?' | | I need to go to the library and speak to the librarian who may be able to help me find sources for my project. |
| | 3rd August 09 | I have changed my project title, as researching physiotherapy techniques is not viable, due to my lack of specialist knowledge that a physiotherapist has. I have now decided to look at treatments and therapies for children with CP instead, as there is a great range of information available on the topic that will not be too difficult for me to understand. My new project title is 'What is cerebral palsy, and what treatments and therapies are available to children suffering from the condition? | | After discussing my project title with my mentor when I went back to college I have now decided to use the title 'What is cerebral palsy and how is it treated in children?' since this title is shorter and more succinct. |
| | 15th October 09 | After writing a draft of my dissertation, I have now decided that my final project title is 'To what extent are different treatments effective in treating children with cerebral palsy?' I don't have enough words to describe CP as well. My previous title would not have involved enough analytical content. | | |

| Activity | Date | Detail | Supervisor's initials | Comments |
|---|---|---|---|---|
| Intended outcome(s)/objectives specified | 1st July 09<br><br>3rd August 09<br><br>15th October 09 | To understand and explain what cerebral palsy is and how it affects children suffering from it. I will also research physiotherapy techniques used by physiotherapists to treat children with the condition. This will include using mainly secondary sources, such as books and the internet.<br><br>To understand and explain what cerebral palsy is and how children suffering from it are affected. I will also research therapies and treatments available to children suffering from CP.<br><br>To evaluate the effectiveness of different treatments available to children with CP, by looking at research evidence. | ADC | |
| What form will the assessment evidence for the project take?<br>(ie design, performance, report with findings from an investigation, artefact, [*dissertation – level 3 only*] ) | 1st July 09 | 5000 word dissertation written after carrying out research into the subject area. | ADC | Although I am doing a dissertation for my final project, I have discussed with my mentor the possibility of using images, as well, where appropriate. |
| Plan worked out to show how to deliver the outcome eg timeline | 5th July 09 | Constructed initial time planner for the summer to ensure that I stay on schedule and will finish my project on time. | ADC | |
| Choose ways to arrive at the outcome eg select tools, equipment, techniques and technologies, to arrive at the outcome | 11th July 09<br><br>14th July 09 | For my project I will use the internet and books, some of which will have come from the Anglia Ruskin library and the library at Addenbrookes hospital.<br><br>I am no longer going to be able to use the Clinical School Library at Addenbrookes for my research, due to being under 18. I will have to use just the Anglia Ruskin library and internet resources instead. | ADC | |

| Activity | Date | Detail | Supervisor's initials | Comments |
|---|---|---|---|---|
| Information obtained from a range of sources | 10th August 09 | I have collected information from a range of sources. I have used a combination of books (some found at a library and others found off Google books), internet research and video/radio clips to enhance my research. | | |
| Information selected to fit the question/task/brief | 26th August 09 | When taking notes from the book 'Children with Cerebral Palsy: A Parents' Guide' I found that although all of the information was very interesting and on the topic of cerebral palsy, only a small amount of the information was totally relevant to my project title. I had to be careful to only select the relevant information. | | |
| Links with other areas of study/areas of interest recognised and applied as relevant | 30th August 09 | I chose my project title as I felt that this related to my own personal interest that I have in health matters. My topic of research links clearly with my intended future career path of physiotherapy. | | |
| Skills applied to information that has been collected in order to achieve desired outcomes (objectives) | 1st Septemb-er 09 | I have done a large amount of research. This research has involved reading from sources, taking detailed notes from them (that I will be able to use when writing up my project) and then reviewing the resources for their reliability. I had to summarise some of the information to ensure that I concentrated on the most important information. | | |
| Tools, equipment, techniques and technologies applied to information that has been collected in order to achieve desired outcomes (objectives) | 1st Septemb-er | For my project I have mostly used Microsoft Word, since I have been doing secondary research, and therefore have not required the use of Excel for presenting primary research results. The majority of my research has come from the internet; however I have also used a library for looking at books, where this was possible. | | I would have used more libraries, but I found that many libraries don't have books relevant to my research. I also found that I couldn't use the Clinical School Library at Addenbrookes hospital, due to being under 18. |

| Activity | Date | Detail | Supervisor's initials | Comments |
|---|---|---|---|---|
| Identify outcomes/objectives achieved so far | 10th Septemb-er | So far I have carried out detailed research into the condition cerebral palsy and how in particular it affects children. Following on from looking at CP, I have also researched a range of therapies and treatments available to children with CP, whilst, in addition, looking at research evidence investigating the use of them and their effectiveness. | | |
| Evaluation of outcomes so far | 10th Septemb-er | I have found that researching therapies and treatments for CP has taken much longer than I had originally planned. It is not possible to look at just one source on each therapy, as this may not tell me all of the information I need to know about it, and so instead I have had to look at a minimum of 3 for each. I also think that my research diary may need some improvement, by making more links between information sources, to show a better comparison between them. | | |
| Evaluation of own learning and performance so far | 10th Septemb-er<br><br>22nd Septemb-er 09 | I believe that I have already learnt a great deal whilst undertaking this project. I have learned a lot about CP, which is something I previously knew little about, as well as treatments and therapies for the condition. In addition to learning about the subject of my research, I have also learned other important skills such as how to reference sources, and the importance of considering the reliability of a source when conducting internet research.<br><br>My first draft of the first section of my dissertation about what cerebral palsy is, although interesting and relevant to my area of research, is too descriptive and doesn't allow for any analytical content. I must therefore be careful to ensure that my final dissertation contains mostly analytical points, to ensure that I meet the project criteria on which it will be assessed. | | |

| Activity | Date | Detail | Supervisor's initials | Comments |
|---|---|---|---|---|
| Revisions made as a result of evaluation | 23rd Septemb-er 09 | After beginning to write up my dissertation I have realised that my research into what CP is will not be suitable for inclusion in my final dissertation, since the information is descriptive not analytical. This has taught me that I should have considered this before starting my research, since this extra research has meant that I have wasted valuable time doing research not needed for my project, even though it has given me a greater knowledge of the condition. In my final dissertation I will therefore concentrate on evaluating the effectiveness of different treatments that I have researched, | | |
| Intended outcomes/objectives achieved | 26th October 09 | Having finished writing my dissertation I believe that I have been very successful in meeting the aims of my project. The content of my dissertation relates very closely with my project title. I aimed to evaluate treatments available to children with CP, and I think that my dissertation fulfils this. | | |
| Presentation of assessment evidence<br>• written section (compulsory)<br>• other evidence can be DVD, photographs, slides, CD, artefact, digital technologies etc | 3rd November 09 | I have written a 5000 word dissertation on the topic of 'To what extent are different treatments effective in children with cerebral palsy?' | | |
| Communication of the outcomes of the project to others | 14th October 09 | Gave a presentation to my mentor and my mentees in my Extended Project lesson, which gave details on what my project was about, and my research process. | | |

| Activity | Date | Detail | Supervisor's initials | Comments |
|---|---|---|---|---|
| Evaluation of the project | 3rd November 09 | As part of my Personal Action Plan (PAP) and Project Progression Record (PPR) I have carried out careful evaluation throughout my project. This evaluation has ensured that wherever possible I have made improvements to my work, to ensure that my dissertation is effectively written and meets the assessment criteria for the project. I also had to ensure that my project title was relevant to the content of my dissertation. After giving my final presentation, I will do a final evaluation of my project. This will allow me to consider how I would do the project differently if I did it again, what lessons I have learned from my research and how these lessons may be useful in the future. | | |
| Project completed | 5th November 09 | My project is now finished and is ready to be handed in tomorrow which is the final deadline. | | |
| Project submitted and assessed | 6th November 09 | Handed in final project. | | |

**Notes**

This form should be used to record the progress of each learner and may also assist in forming a basis and justification for the mark awarded under each assessment criterion (for example, by indicating the level of support needed by the learner).

***At Level 3 it is not intended that the supervisor gives any written feedback to the learner in the comments section.*** *Verbal feedback may be given by the supervisor; this should not be recorded on this form. Learners may use the comments section for taking notes.*

A copy of this form must accompany each learner's work when it is submitted for Moderation.

## Extended Project Initial Plan

| Date, week beginning | Aims | Outcome- did I achieve my aims? | What next- any changes? | Notes |
|---|---|---|---|---|
| 29th June | • Decide on project title, fill in my VTT and begin planning my research<br>• Speak to the librarian about using the Anglia Ruskin library and possibly the library at Addenbrookes for my research | I have decided on a title for my project and have completed my VTT to hand in to my mentor.<br>After discussing my project with the librarian, I was given a website to look at for the Anglia Ruskin library, and also an email address to contact someone at Addenbrookes to find out if I will be able to use the library at Addenbrookes library for my research. | • I need to visit the Anglia Ruskin library<br>• I will email Addenbrookes to find out about using the Clinical School Library | |
| 6th July | • Visit the Anglia Ruskin library to search for books that will be relevant to my research<br>• Have meeting with mentor to discuss my progress and my plans for my project during the summer | I emailed Addenbrookes and received an email back saying that I would be welcome to use the Clinical School Library at Addenbrookes. I also visited the Anglia Ruskin library and found a very useful book about cerebral palsy. I met with my mentor to discuss my project and my plans for my project during the summer. | • Visit the Clinical School library at Addenbrookes to help with my research<br>• Continue researching cerebral palsy so that I gain a better understanding of the condition<br>• Revisit the Anglia Ruskin library to finish making notes from the book that I used previously | On Biology field course from Tuesday to Thursday |
| 13th July | • Begin researching cerebral palsy and the effects it has on children suffering from it<br>• Write up my research and what I have learned from it<br>• Buy a book from Amazon or borrow a book from a library to take to read on holiday | I ordered a book off Amazon that I will be able to take with me on holiday to Spain, due to there not being any suitable resources in local libraries which can be loaned out. I revisited the Anglia Ruskin library and finished making notes from a book about CP. I also found a | • Read book whilst on holiday to give me a better understanding of CP<br>• I will no longer be able to use the Clinical School library at Addenbrookes due to being under 18, and so will need to use the Internet to look for e-books that | |

| | | | | |
|---|---|---|---|---|
| | | paragraph in a book that may be useful for my project. | will be helpful for my project | |
| 20th July | • Read book and make notes on what I have learned from it | I read nearly the entire book whilst away, with the exception of the last paragraph. I did not get the chance to make notes from the first chapter which is about what CP is. | • I am going to finish reading the book<br>• I will make notes from the first chapter<br>• Begin using *Google books* for my research | In Spain on holiday |
| 27th July | • Complete research into what cerebral palsy actually is and collect together all my notes in preparation for writing it all up at a later stage | Made notes from chapter 1 of book that I read on holiday. Used *Google books* to look at various books about CP, which I found to be very helpful for my research. | • I am going to have to change my project title slightly, due to researching physiotherapy techniques being too complicated for me to be able to understand<br>• I am going to have to make use of the books available to me at home and on the internet, due to a lack of libraries with suitable books for my project (although I may go back to the Anglia Ruskin one at some point) | |
| 3rd August | • Visit a library to look for more books that may be helpful to me<br>• Write up research so far into physiotherapy techniques | I ensured that my research diary was up-to-date, and that I have detailed enough notes. Changed my project title to be able treatments and therapies for CP. | • Continue researching treatments for CP<br>• Look at studies into their effectiveness | |
| 10th August | • Continue researching physiotherapy techniques used to treat cerebral palsy (now I have changed this to treatments)<br>• Write up any relevant research | I looked at studies into the effectiveness of robotic therapy and suit therapy. Reviewed research diary. | • Write up some of my research to help when writing up my final dissertation | |
| 17th August | • Do a mock write up for my project to help me identify any research still required and to give me a measure of how much research I have collected so far | Didn't do a mock write up. Instead decided that my time would be better spent doing further research. Researched hippotherapy and electrical stimulation. | • Review my research done so far<br>• Read a book relevant to my research | |
| 24th August | • Identify any gaps and see what extra research I need to do for my project | Decided that I needed a little more research into studies into the | • Realise that I need to search for more research studies into the | In Derbyshire on holiday |

| | | | | |
|---|---|---|---|---|
| | • If possible take a book with me on holiday to help with my research | effectiveness of robotic therapy. | effectiveness of robotic therapy, as this area of research has a few gaps | |
| 31st August | • Finish researching my topic<br>• Collect together all of my research to ensure that there is not any research missing | Researched hyperbaric oxygen therapy. Reviewed my research. | • Need to research physical therapy and then my research will be complete | |
| 7th September | • Aim to have completed my research by this point so that I am ready to begin writing up my project<br>• Write plan for dissertation | Wrote a plan for my dissertation, and think that I have finished researching my topic, having done research into physical therapy this week. | • Begin writing dissertation | |
| | | | | |

## Research Diary

This is an example of a page from my research diary.

**Session date** 17th August 09

**Resource used** Google search
www.boyercc.org/docs/print/EBP_Cerebral_Palsy.doc

**Brief description of source** This source is an article written by Gay Burton, who is a physical therapist. It looks at the use of hippotherapy with children who have cerebral palsy, with the use of research evidence.

**What was I hoping to find out?** I was hoping to learn about how effective hippotherapy has been shown to be by research studies. I wanted to know if this evidence supports the use of the therapy with children with CP. I also hoped to learn a little about the history of the treatment.

**Brief summary of what I have learnt from the source**

- Hippotherapy has been used in Europe since the 1960's and in the United States since the 1970's, in combination with traditional treatment strategies
- The excitement of working with a horse creates the enthusiasm and motivation needed for the child to actively participate in the therapy, improving the outcome of the therapy
- Sitting on a pad rather than a saddle allows the child to better feel the horse's movement
- During the therapy, the child learns to anticipate and make postural adjustments needed to remain upright
- The warmth of the horse as well as the rhythmic movement is thought to be useful in reducing high muscle tone and promoting relaxation in a rider with spasticity. During the treatment, the movement of the horse is controlled by the therapist.
- A study done by Bertoti (1988) on children with spastic cerebral palsy showed that posture was significantly improved in 8 out of the 11 children, who had all participated in hippotherapy provided 2 times a week for 10 weeks. The children with spastic diplegia showed overall improvement while children with spastic quadriplegia showed more improvement in head and shoulder alignment. All of the parents and referring therapists reported improvements such as reduced spasticity and improved balance.
- McGibbon, Andrade, Widener and Cintas (1998) looked at the effects of an 8-week program of hippotherapy on performance on the Gross Motor Function Measure (GMFM), energy expenditure during walking, and gait parameters in 5 children with spastic CP. All 5 children demonstrated a significant decrease in energy expenditure during walking and a significant increase in GMFM walk/run/jump subtest after hippotherapy. A trend towards increased stride length and decreased cadence during walking was recorded.
- Sterba, Rogers, France and Vokes (2002) used the GMFM to assess change in 17 children and teenagers with CP (with an average age of 9.8 years) who participated

in a series of 6-week hippotherapy session. Significant improvements in GMFM walk/run/jump subtest scores were found after 12 weeks of hippotherapy and significant improvements in overall score were found after 18 weeks of hippotherapy.

- Casady and Nichols-Larsen (2004) studied 11 children with CP, aged 2.3-6.8 years. The Pediatric Evaluation of Disability Inventory (PEDI) was used in addition to the GMFM, which measures the child's functional performance in the home and community in the areas of self-care skills, mobility and social function. The improvements in PEDI total score, PEDI social score, GMFM total score amd GMFM crawling/kneeling subtest show a significant treatment effect after the hippotherapy phase and no change in function during the no-treatment phase of the study.

**Reliability of source** I think this source should be reliable as it has been written by a physical therapist, and all of the information is supported by research evidence from studies that have been carried out. I cannot, however, be completely sure of the reliability of the article, since it gives no information about Gay Burton himself and the experience which he has with the therapy.

**Where next?**

- Look for another information source on hippotherapy, in an attempt to find out more about which physical therapists qualify to carry out the therapy
- I would also like to find out about the hippotherapy treatments available in different countries

# Research Diary

This is an example of a page from my research diary.

**Session date** 6th September 09

**Resource used** Physiology and medicine of hyperbaric oxygen therapy
By Tom S. Neuman, Stephen R. Thom
Published by Saunders on June 5, 2008
Pages 466 to 468

**Brief description of source** This book describes how recovery can be helped through hyperbaric oxygen therapy. It provides evidence-based, practical, useful information for anyone involved in hyperbaric oxygen therapy. It presents research evidence to support the effectiveness of HBO therapy, as well as looking at possible side effects.

**What was I hoping to find out?** I was hoping to find out about the findings of a number of research studies carried out into the effects of hyperbaric oxygen therapy (HBOT), as well as the methods used to come up with the results.

**Brief summary of what I have learnt from the source**

Summary of clinical evidence for the use of HBOT:

- Machado (1989) gave 230 children with CP 100% oxygen at 1.5 ATA for 1 hour once/twice daily to a total of 20. He found that the outcomes of HBOT were reduced spasticity, improved attention, and reduced convulsions.
- Montgomery and colleagues (1999) used 25 children aged 3-8 years old with spastic diplegia and gave 95% oxygen at 1.75 ATA for one hour once/twice daily to a total of 20. It was found that GMFM (gross motor function measure) increased by 5.3%, they showed better walking, and parents noted improved alertness and communication.
- Collet and colleagues (2001) used 111 children aged between 3 and 12 years old, and gave 1 group 100% oxygen at 1.75ATA compared to 1.3ATA air in the other. Both groups were given 1 hour daily sessions, for a total of 40 sessions. It was found that GMFM (gross motor function measure) improved about 3% in both groups and there were no differences in neuropsychological outcomes.
- Neubauer (2001) used about 250 children aged 6 weeks to 14 years old. They were given up to 1.5ATA 100% oxygen for 1 hour. 90% were found to have improved SPECT (single-photon emission computed tomography) and parental ratings of function.
- Chavdarov (2002) used 50 children with various types of CP. They had 1.5-1.7ATA for 30 minutes daily to a total of 20. 4 were withdrawn with adverse effects; however there was improved motor function in 13% and improved mental function in 6%.

**Reliability of source** I believe that this source will be reliable as the book has been written by "internationally recognised leaders in hyperbaric oxygen therapy research and practice".

**Where next?**

- I am going to revisit the book 'Children with cerebral palsy- A parents' guide' to look again at physical therapy, occupational therapy, and speech and language therapy.

# Plan for dissertation

Introduction

Hyperbaric Oxygen Therapy (HBOT)

- What is HBOT?
- Cornell University study (Alibhai, T), Montgomery and colleagues, negative side effects
- Machado, methodology
- Cornell University study ( Packard, M), long term effects

Hippotherapy

- What is hippotherapy?
- Bertoti., McGibbon, Andrade, Widener and Cintas, sample size
- Casady and Nichols-Larsen (PEDI), everyday life effects
- Benda, McGibbon and Grant, control group
- Winchester, Kendall, Peters, Sears and Winkley, MacKinnon and colleagues, difficulty measuring effects
- Safety, enjoyment

Suit therapy

- What is suit therapy?
- Euromed, problems with reliability
- Pilot study at University of Minnesota, cost-effectiveness
- Dr Edward Dabrowski- Children's Hospital of Michigan, generalisability

Robotic therapy

- What is robotic therapy?
- Published pilot studies, motivation and enjoyment
- Steven Cramer, manual dexterity, only done with stroke patients
- Effects on physiotherapists and lives of CP sufferers

Physical therapy

- What is physical therapy? NDT?
- Palmer et al, long term benefits, standard of physical therapy received
- Kluzik, Fetters and Coryell, research into different types of CP
- NDT and use with another treatment, burdens on family
- Ottenbacher et al- meta analysis

Conclusion

## Evaluation of my research

I think that my research into the effectiveness of treatments for children with cerebral palsy has been very effective, as I believe that I have produced a detailed and analytical dissertation, which carefully follows my project title. Unfortunately, the majority of my sources have been online ones, due to the lack of books available on the topic at local libraries. However, for all of the websites used I have carefully considered their reliability before using them, and in most cases these sources have been written by experts or physical therapists that are likely to be a reliable source, due to them being knowledgeable of the area. I have also used a lot of e-books, particularly from Google books, as this has allowed me to access pages from books that are relevant to my research, without needing to buy the books.

A particular problem that I have had with my project is that to begin with I spent a large amount of time researching what the condition cerebral palsy actually is. However, after beginning to write my dissertation I realised that I would have to omit this section, due to the content not being analytical, and so not meeting the assessment criteria of the project. Therefore this meant that I wasted valuable research time researching a topic not directly relevant to my dissertation, even though it did increase my overall knowledge of what cerebral palsy is. If I was to do this project again, I would ensure that my project title carefully met the assessment criteria before beginning the project, so that extra and unnecessary research was not done.

## CONTACT US

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