Detailed description of the Model of process for advising on Computers

Phase 1: problem
Goal: the questions of parents/carers, group leaders and/or teachers have been clearly formulated and put in writing.

A question about the use of computers can reach the advisory group along different routes.
By structuring the questions of parents/carers, group leaders and/or teachers and recording them in a form to be filled in the questions have a less superficial character. An entry form may be a good idea.
In case of an external application or an application for the home environment the costs of consultation have to be claimed from the client's medical insurance. The entry form requests the parents/carers to check the coverage of their medical insurance. It should be made clear to the parents/carers that there is a difference between the reimbursement for the computer equipment itself and the reimbursement for the recommendation by the advisory group.

Phase 2: indication
Goal: It is determined whether a computer with an adaptation, if necessary, is the solution to the problem of the client and his/her social environment.

It will be decided in consultation with all those concerned whether the advisory group can manage the problem.
If the medical insurance does not cover a recommendation by the advisory group, the advisory group may contact the medical insurance company to support the application. If the insurance acompany is not prepared to reimburse the expenses, other possiblities will have to be considered.
The applicant will be notified about the decision of the advisory group.

Phase 3: the listing of data for the use of a computer
Goal: All data necessary for the use of a computer have been listed and put in writing.

The listing consists of the following components:
a) a listing of the client's skills
b) a listing of the tasks
c) a listing of the social environment
d) a listing of the physical environment

The skills of the client are listed to form an idea of his/her motor, sensory, cognitive, intrapersonal and interpersonal skills, while the client's wishes and interests are described as well.
In addition, we need to know which tasks the client can or wants to perform on the computer and the objects connected with them. The tasks are subdivided into the following categories of ability: the ability to cope for oneself, education and recreation.
While listing the social environment we determine which persons are most involved with the client and who may get involved in the client's future use of the computer. The wishes, expectations, objections, knowledge and motivation of

these persons are being listed. At the end of this phase we will also know who is prepared to undertake (part of) the assistance for the computer work.

Details about the location in which the computer will be used (e.g. at school and/or at home; in a classroom or a separate room) are collected while listing the physical environment. It will be checked to what extent the room is appropriate for the client to work on a computer (e.g. the level of distractions, accessibility etc.)

The data about the client can be acquired in different ways, such as from files, videos and consultations with other disciplines and persons most involved. Information acquired from the direct contacts with the client by means of observation and research can also be used

Phase 4: crucial points and conclusion

Goal: the advisory group has decided whether the advisory track will be continued. The data collected in phase 3 are summed up in crucial points. These crucial points will be linked up with the conclusions. On the basis of these conclusions a decision is taken about the progress of the advisory and assistive track.

The decision might be to terminate the track. In that case the applicant should be contacted to discuss the matter.

If there are any doubts, a decision is taken in consultation with all those concerned.

Phase 5: List of requirements

Goal: a list of requirements has been made.

In this phase the data collected are converted into a list of requirements, which indicates concretely which requirements the computer and its adaptations, if any, should meet.

The list of requirements consists of a number of components. Requirements are being made with reference to:

a) The client's skills

The computer and its adaptations, if any, should fit the client's skills. Working on the computer includes: the input of information by means of input devices and reception of the feedback the computer produces by means of an output device. For both input and output devices there are specific requirements. In addition, expectations for the future should be taken into account.

b) The tasks

Depending on the nature and the number of tasks to be performed on the computer special requirements can be stipulated for the hardware, software, input and output devices.

c) The physical environment

The listing of the client's skills also produces data, which set requirements for the room in which the computer is placed. If e.g. the listing of the client's skills shows that the client is easily distracted, a requirement of the environment might be that there are, if possible, no distractions in the room.

d) The social environment

If the listing shows that more than one person works with the computer, a requirement may be that the set-up, both hardware and software, can easily be switched.

The listing shows how much assistance the client needs and how much assistance has already been provided. On the basis of this information the requirements for the assistance are being stipulated.

e) Remaining requirements

The remaining requirements are those, which don't fall into the above headings, e.g. the financing of the computer and its adaptations, if any.

Thus it may be required that a certain budget will not be exceeded or that other ways of financing will have to be found.

Phase 6: Determination of the product

Goal: The different options of computer equipment (hardware and software, input and output equipment), the extent and nature of the assistance, the placing of the equipment and the conditions have been listed and choices have been made.

On the basis of the listing and the list of requirements the consultant forms an opinion about which computer, adaptations and software meet the requirements best.

The interaction between computer and man consists of several phases. First, the user inputs information, then the computer processes it and produces information to which the user, for his part, can react.

Schematic representation:

| User | → | Input of message | → | Computer | → | Output of message | → | User |
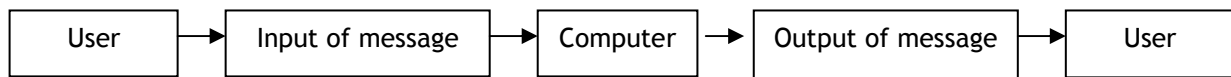
Per phase we can check the requirements from the list of requirements and try to find a solution.

The user

There are a number of basic conditions, which should be fulfilled to enable the client to use the computer. We are thinking of e.g. starting position and support.

Input of information

Most appliances with regard to computer aided equipment belong to this category. There are plenty of solutions in the field of input equipment.

The following categories are conceivable:
- alternative keyboards (based on simplifying and increasing or reducing the size of a standard keyboard)
- alternatives to cursor activation (see table 1)

Hierarchy of appliances	
1. Standard mouse	9. Mouth or chin joystick
2. Trackball	10. Head mouse
3. Joystick	11. Four switches
4. Mouse keys	12. Speech activation
5. Touchscreen	13. Three switches
6. Foot mouse	14. Toe switch
7. Touchpad	15. One switch
8. Five or more switches	16. Eye activation

Table 1.

Source: Alternatieven voor de Muis (Alternatives to the mouse) Baar, Hekkert, Hofs, 1998.

An appliance to make it easier to choose between the possiblities of alternative cursor activation is "Alternatieven voor de Muis" . This booklet includes a manual with a flow diagram for occupational therapists to help them select appliances for cursor activation by means of the physical characteristics of the client with infantile encephalopathy.

Computer
Solutions with respect to the software are developing rapidly. Solutions in software often seem more natural than solutions in hardware. When dealing with this kind of solutions we can think of:
- software alternatives to keyboards
- software which makes the signals on the screen clearer.
The computer's capacity (capacity of the hard disk, working memory, clock frequency etc.) should be geared to the software, which is used now and in the future.

Output of information
The signal that indicates that the computer is processing the message should be in keeping with the sensory perception and the level of development of the user. The listing of the client's skills shows the user's possibilities.

User
Despite all possibilities computer technology provides we should bear in mind that the central figure will always be the user. Eventually the placing of the computer should guarantee that the user can use the computer efficiently and effectively and therefore has the opportunity to participate actively in e.g. education and leisure activities.

Phase 7: Trial period
Goal: It is determined which computer equipment, (hardware and software, input and output equipment), the extent and nature of assistance, the placing of the equipment and the conditions are most appropriate for the client.

During the trial period the client and the people involved try out the computer equipment. A trial period may consist of several trial sessions. At the end of the trial period the definitive recommendation is given, on the basis of which the application procedure can be started.
Prior to the trial period a plan may be devised stating the following items:
a) who will be present during a trial session
b) on which day/moment is the trial session going to take place
c) how long does a trial period last
d) how much time is needed for habituation
e) which computer equipment (hardware and software, input and output equipment) should be available
f) where do the trial sessions take place

Phase 8: evaluation of the trial period and advisory report
Goal: the definitive choices for the use of a computer have been made and laid
down in an advisory report.

The trial placing is evaluated by the advisory group by means of the list of
requirements.
If the equipment is not satisfactory, the cause of this should be tracked down
and it should
be checked whether the equipment or the conditions can be adjusted. In
addition, we
should take a look at the client's functions and skills and determine whether
these can be trained.
It may be possible that the problems are difficult to solve because the whole is
more complex than we expected. In that case it is wise to go back to a previous
phase, e.g. the (general) listing or the listing of requirements.
If the equipment proves to meet all requirements or if an acceptable compromise
has been reached the definitive recommendation can be made. This includes data
relative to the following items:
• the hardware
• the software
• the client's response to the computer
• The kind of assistance most appropriate for the client
• The nature and design of the location where the computer will be placed
• The arrangement of the place to work

Phase 9: application and supply
Goal: It is now clear whether or not the necessary computer hardware and/or
software will be reimbursed; the computer equipment is ready to be used
by the client and the people involved.

The agency where an application should be filed depends on the situation:
• At home:Regulations for Aids 1999 under the Dutch National Health Act
(ZFW) formerly AWBZ
• Regular education: Reintegration Act (REA, formerly AAW)
• Special education: when used at school: the school bears the costs. Under
the REA Act a computer is provided for homework from class 3 of primary
school.
• At work: Reintegration Act (REA Act, formerly AAW)
If there is no reimbursement under the above-mentioned Acts one can file an
application for reimbursement with a fund. The Prinses Beatrix Fonds particularly
focuses on communications. ANGO integration of handicapped people focuses on
education and work. More information is available in "Alternatieven voor de
Muis" and "Gids computergebruik thuis" (guide to the use of computers at
home) (VOLG), "Ziekenfondsbrochure" (brochure of the Dutch National Health
Service) (BOSK) and " Wist u dat…?" (Did you know that..?) (BOSK).
The procedure with all applications is that a letter of recommendation plus a
letter from a doctor and an offer should be sent to the agency that reimburses
the costs. It should be checked in advance if the agency makes demands on the
supplier.
After the approvement the equipment will be supplied. The consultant should
make arrangements with the supplier in advance about supply and setting up.

Phase 10: Implementation
Goal: The client and the people most involved make optimal use of the computer
equipment.

The phase of implementation is an important phase: without a sound
implementation there is a chance that the client and the people involved don't
make optimal use of the computer equipment. The implementation consists of
instruction of the client and the future assistants. Extensive instruction given by
the advisory group is possible, but in that case an application should be filed with
the agency that reimburses the costs.
In consultation with the client and the people involved a plan should be drawn up
including the following items:
- The extent and kind of instruction the consultant gives to the client
- Which person is going to assist the client
- The extent and kind of instruction given by the consultant to the future
  assistants to the client
- The moment when the consultant delegates his task to the assistants
- The way in which the client learns to handle the computer step-by-step
- The times of evaluation
- The persons standing by when the client or the people involved have
  problems.

Phase 11: evaluation
Goal: It is determined whether the computer equipment and its use fulfil the
requirements and meet the expectations of the client and the people most
involved.

The client should evaluate the use of the computer and the people most
involved. Thus it will be possible to take advantage of (expected) changes by the
progressiveness of an illness or the developments a client undergoes. Dependent
on the situation the evaluations may take place after 3, 6 and 12 months and
then once a year. If any problems arise one may contact the advisory group.