

CIRCUITS

Therapist's manual

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1. What is CIRCUITS?

CIRCUITS stands for 'Computerised Interactive Remediation of Cognition Training for Schizophrenia'. In other words, it is a computerised Cognitive Remediation Therapy (CRT) programme for people with a diagnosis of schizophrenia or schizo-affective disorder. CRT is a psychological treatment which aims to improve cognitive functioning or thinking skills in people with these diagnoses. It does not aim to address thought- or belief-content or emotions directly, but teaches basic thinking skills, using non-emotive material, which may facilitate more complex social behaviours and everyday living skills. It is also possible that these thinking skills can be utilised in other therapies which do address beliefs (e.g. cognitive behaviour therapy).

2. Why improve cognitive skills in schizophrenia?

Over the last few decades, it has become increasingly clear that cognitive deficits may constitute central and enduring characteristics of schizophrenia (Goldberg et al, 1993) and that they may have a significant impact on people's quality of life, their symptoms and functional outcome (Green et al, 2000). They are generally present throughout the course of the disorder (even from the very first onset of symptoms), and while most problems remain relatively stable, some of the deficits (such as attention) worsen during psychotic episodes. It has been hypothesised that if cognitive deficits could be reduced, gains in other areas of people's lives may be made.

2.1 Quality of life

People with a schizophrenia diagnosis are frequently aware of significant cognitive difficulties and report finding them distressing. For example, distractibility may lead to difficulties in concentrating well enough to watch television, read or hold conversations. People are often frustrated by poor memory and an inability to organise themselves to carry out everyday tasks such as shopping or cooking. These difficulties are often reported by people with a diagnosis of schizophrenia to be more distressing than symptoms.

2.2 Social functioning

In a seminal review of the literature, Michael Green and colleagues (2000) concluded that there are 'significant associations' between cognition deficits in people with schizophrenia and functional outcome in terms of social problem solving ability, community functioning, activities of daily living and response to psychosocial rehabilitation programmes. The most significant cognitive deficits appear to be long-term verbal memory, short-term and working memory, vigilance and executive functioning (measured by card sorting).

Although we do not understand the mechanisms through which cognition and functional outcome are associated in schizophrenia, there is face validity to the relationship. For example, in order to learn new skills, it is necessary to be able to store the relevant information in memory and to be able to retrieve it when needed. 'Vigilance' refers to the ability to discriminate a target signal from background noise; this skill may relate to the ability to separate relevant from irrelevant information in social situations. Executive functioning is required for

the planning, implementation and monitoring of goal-directed activities (such as shopping, cooking, cleaning), and is necessary to respond flexibly and appropriately to changes in the environment.

2.3 Effectiveness of rehabilitation programmes

Michael Green has suggested that cognitive deficits in schizophrenia may act as 'rate-limiting factors' (1996) which prevent clients from benefiting from rehabilitation programmes and there is now evidence to support this claim. Poor concentration and memory, distractibility, and difficulty in creating and achieving goals, problem-solving or planning, are likely to lead to problems in making use of any type of formal training, discussion, group activity etc. such as may be provided by Occupational Therapists, Day Centres, Clinical Psychologists and so on.

2.4 Symptoms

The vulnerability-stress model of schizophrenia (Zubin and Spring, 1977) states that people with schizophrenia frequently have a number of factors (such as certain genes or neurodevelopmental abnormalities) which may predispose them to developing symptoms in the face of stressful events. Cognitive deficits are thought to act as vulnerability factors, increasing the likelihood of symptom onset or recurrence following a stressful life event. For example, there is some evidence to suggest that having a low IQ is a risk factor for schizophrenia (Malmberg, Lewis, David and Allebeck, 1998) and the siblings of people with a diagnosis of schizophrenia frequently have characteristic cognitive deficits (e.g. Grove, Lebow, Clementz, Cerri, Medus and Iacano, 1991). Wykes and Dunn

(1992) also showed that following clients' move from a long-stay psychiatric hospital into more demanding environments in the community, cognitive impairment was significantly predictive of increases in positive symptoms.

In addition, there are a number of psychological theories of schizophrenia which suggest a more direct association between cognitive impairment and symptoms. For example, Frith (1990) proposed that three core cognitive deficits may underlie both positive and negative symptoms. Firstly, an impairment in willed action (self-generated behaviour), leads to poverty of action and an inability to suppress inappropriate behaviour. This results in perseveration and responses to irrelevant stimuli and so plans cannot be carried through to completion. Secondly, defective self-monitoring leads to delusions of alien control, certain auditory hallucinations and thought insertions, as the person is unaware of the intention accompanying his or her own acts and therefore experiences self-generated thoughts and behaviour as being caused by an alien force. Thirdly, an inability to monitor beliefs and intentions of others leads to delusions of reference, paranoid delusions, certain kinds of incoherence and third person auditory hallucinations.

3. Which cognitive deficits does CIRCUITS target?

Schizophrenia is a remarkably heterogeneous syndrome, with great variations in symptoms, prognosis, response to treatment etc. This is also the case for cognition in schizophrenia. There is no standard profile of cognitive deficits and no two people will show a similar pattern or level of impairment. Furthermore, people with schizophrenia show impaired or poor performance on almost any

neuropsychological test. This is reflected by the fact that for people with a diagnosis of schizophrenia, IQ or intellectual functioning is generally lower than would be expected. IQ is generally predictable from parents' level of education, the intellectual functioning of close relatives, socio-economic class etc. People with a schizophrenia diagnosis tend to perform at a lower level than would be expected from these factors.

Although a generalised deficit is frequently apparent, people with schizophrenia do not perform equally poorly on all neuropsychological tests. Even when lower IQ is taken into account, impairment is often seen in executive functioning, memory and attention. These problems have also been shown to be important in predicting functional outcome. They remain relatively stable throughout the course of the disorder and therefore may constitute vulnerability factors. It seems likely that a reduction in these deficits may be protective against symptomatic relapse. In addition, executive functioning is the area of cognition implicated in Frith and others' psychological theory of the symptoms of schizophrenia, and reductions in impairment may have a direct beneficial impact on symptoms. For these reasons, CIRCUITS aims specifically to rehabilitate attention, memory and executive functioning.

3.1 Executive functioning

Executive functioning refers to a number of complex thinking skills which are used to generate and manipulate novel or non-routine information and behaviour. Shallice's model (1988) is perhaps the most accepted model of executive functioning, which he calls the Supervisory Attentional System (SAS).

In his model, the SAS is the higher-order component of a two-tiered information processing system. The lower level component, which operates automatically and is modulated by the SAS, is the Contention Scheduling System (CSS). The role of the CSS is to carry out routine, well-learned and automatic activities, such as eating, driving to work, taking a shower. If the CSS is left to function uninterrupted by higher-level thinking skills, it would act only in response to environmental triggers, and would continue with the same action unless distracted by another environmental stimulus. If no particular action was triggered by the environment, the CSS would do nothing.

The CSS is operated by the SAS which is required for novel, or less routine tasks, which are not specified by the environment. The SAS is under deliberate and conscious control and may alter the priorities of the CSS by activating or inhibiting particular responses. For example, the CSS may control the behaviour needed to drive to work along a familiar route, but should the route become inappropriate (e.g. because of a tree in the road), the SAS would be required to stop this behaviour, plan a better route, initiate the behaviour required to carry out the plan, and to monitor the action to ensure the goal is achieved. The SAS therefore has a number of tasks, including initiating novel responses, inhibiting inappropriate automatic and environmentally-driven responses, controlling and shifting attention, developing and implementing strategies, and monitoring activities and then correcting any errors. These component executive functions are generally believed to be dissociable and thus can be differentially impaired.

Evidence for executive impairments in people with schizophrenia commonly comes from performance on the Wisconsin Card Sort Test (WCST). For this task, participants are required to match a pack of cards to one of four key cards, according to a changing rule (colour, shape or number). They are not told how to match the cards, but are told whether or not the match they have made is correct. When they have made ten consecutive correct matches, the rule is changed without their knowledge, and they must then determine the new rule on the basis of continued feedback from the tester. The WCST comprises a number of executive processes: abstraction of the matching rule, maintenance of this concept for ten consecutive matching cards, and then suppression of this habitual response and initiation of a new set of responses according to the new rule. Evidence from numerous studies suggests that people with schizophrenia tend to perform poorly on the WCST, even when general intellectual functioning is taken into account. In particular, they tend to have difficulty in working out the rules and to perseverate on an incorrect response (e.g. Goldberg, Weinberger, Berman, Pliskin and Podd, 1987; Stuss, Benson, Kaplan, Weir, Naeser, Lieberman and Ferrill, 1983).

Many other studies have investigated executive functioning in people with a diagnosis of schizophrenia using alternative measures and found impaired performance. Neuropsychological tests which are thought broadly to measure cognitive flexibility, including the abilities to shift mental sets and to inhibit inappropriate responses, have included the Stroop test, (Vendrell, Junque, Pujol, Angles Jurado, Molet and Grafman, 1995; Nopoulos, Flashman, Flaum, Arndt and Andreasen, 1994), part B of the Trail-Making Test (Nopoulos et al.,

1994), the Hayling test (Nathaniel-James, Fletcher and Frith, 1997; Greenwood et al, 2000), and a spatial response inhibition task (Wykes, Katz, Sturt and Hemsley, 1992). Poor performance is also generally found on tasks measuring guided lexical search, namely word fluency (Kolb and Whishaw, 1983; Goldberg and Weinberger, 1988) and on design fluency (Kolb and Whishaw, 1983). These tasks presumably tap not only response initiation skills, but also an ability to inhibit competing inappropriate responses, as well as strategy use. Finally, people with schizophrenia diagnoses generally perform poorly on tests of planning, including the Tower of Hanoi test (Goldberg, Saint-Cyr and Weinberger, 1990; Schmand, Brand and Kuipers, 1992), the Tower of London task (Andreason, Rezai, Alliger, Swayze, Flaum, Kirschner, Cohen and O' Leary, 1992; Morris, Rushe, Woodruffe and Murray, 1995; Robbins, James, Owen, Sahakian, Lawrence, McInnes and Rabbitt, 1998), and the six elements task (Shallice et al. 1991; Carstairs et al 1995).

3.2 Common executive problems

Executive impairments can have a significant impact on everyday life and lead to a number of problems commonly seen in people with schizophrenia. These may include:

- Impulsivity,
- Difficulty initiating responses (e.g. in conversation),
- Failure to develop or maintain strategies,
- Perseveration (i.e. getting stuck repeating behaviour or thinking which becomes inappropriate or irrelevant),

- Disorganisation,
- Disinhibition,
- Distractibility,
- Failure to check or monitor behaviour so that lots of errors are not corrected.

3.3 Memory

Schizophrenia is associated with deficits in short-term memory and explicit long-term memory whilst implicit memory remains intact (e.g. Keri, Kelemen, Szekeres, Bagoczky, Erdelyi, Antal, Benedek and Janka, 2000). Short-term memory has been redefined as 'working memory' (Baddeley, 1986), which refers to the ability to hold and manipulate small amounts of information in mind for a short time.

Evidence from recent studies examining verbal short-term memory, suggests that most people with a diagnosis of schizophrenia have a forwards digit span within the normal range (e.g. Tamlyn et al 1992). However, there is some suggestion that the mean digit span may be marginally impaired (e.g. Goldberg et al 1993). A similar picture seems to emerge from studies of spatial short-term memory using the Corsi block span (Gruzelier et al 1988).

Deficits on tests which require the manipulation of information held in a short-term store, rather than storage alone, seem to be more pronounced. Morice and Delahunty (1996) demonstrated that whilst simple, or primary short-term memory, measured by Digit and Word Spans forwards was intact, performance on tasks such as Digit Span Backwards, Alphabet Span and Sentence Span

(Daneman and Carpenter, 1980), which required more complex mental manipulation of information, was impaired. There is also evidence for a spatial working memory deficit (Park and Holzman, 1992).

Long-term memory has an apparently limitless capacity and involves the handling of information from beyond half a minute to many years. It can be divided into explicit memory, which relies on conscious recollection and can be explicitly stated through language, and implicit memory, which occurs outside conscious awareness (for example, memory for how to perform certain tasks). Whilst there is clear evidence for impaired explicit memory in people with schizophrenia, implicit memory appears to remain intact.

A number of studies have attempted to assess memory for remote events in schizophrenia. Methodological problems are associated with this approach, as failure may be due to a lack of awareness of events at the time of their occurrence rather than poor memory. Despite these difficulties, a number of studies have assessed people with a diagnosis of schizophrenia on their knowledge of famous events and personalities of the past and found them to perform worse than controls (e.g. Gilbertson and van Kammen, 1997; McKay, McKenna, Bentham and Mortimer, 1996; Tamlyn et al, 1992; Squire and Cohen, 1979). Performance on standardised tests of autobiographical memory is also impaired in people with schizophrenia relative to normal controls (Feinstein, Goldberg, Nowlin and Weinberger, 1998; Kopelman, Wilson and Baddeley, 1990).

In the learning of new material, impairment has been identified at both the encoding and recall stages (e.g. Calev et al 1983). People with schizophrenia have deficits in both recall and recognition, but recall seems to be the more impaired (Aleman, Hijman, de Haan and Kahn, 1999). Impairment is seen in tests such as verbal, spatial and visual paired associate learning (Rushe, Woodruff, Murray and Morris, 1999; Goldberg et al, 1993; Gruzelier et al, 1988), word and face recognition (Warrington, 1984), verbal, spatial, visual and prospective memory subtests of the Rivermead Behavioural Memory Test (Tamlyn et al, 1992; Duffy and O'Carroll, 1994), and tests of ability to recall stories or abstract designs (Kolb and Whishaw, 1983).

Implicit memory in schizophrenia is often assessed using the Pursuit Rotor Test, in which the participant's task is to maintain contact between the tip of a light-sensitive wand and a small, lit target area that moves in a circular path at a constant speed. Most studies have reported that people with schizophrenia have normal rates of improvement (e.g. Huston and Shakow, 1949; Kern, Green and Wallace, 1997; Goldberg et al, 1993).

3. 4 Common memory problems

- Difficulties with working memory may result in problems in holding a long conversation or following a story in a book, as information cannot be remembered for long enough to keep track of what is going on; problems in remembering tasks etc.

- Problems with long-term memory are likely to result in poor general knowledge, poor memory for personal information, forgetting important details etc.

3.5 Attention

In general, attention can be viewed as a pool of nonspecific resources that can be allocated voluntarily to particular information processing tasks (Kahneman, 1973). Attention may act in a number of specific ways, including maintaining an alert state, orienting to novel stimuli, selectively filtering relevant information, shifting from one cognitive set to another and rapidly discriminating or scanning stimuli.

Nuechterlein and Dawson have proposed that a wide range of deficits in schizophrenia could be viewed in terms of reduced availability of attentional or processing resources (Nuechterlein and Dawson, 1984), although, generally a small number of component attentional processes have been implicated in schizophrenia research. These include early visual attention, vigilance and selective attention.

3.6 Early visual attention

In recent years, the most frequently used paradigms to assess early visual attention in schizophrenia have been the Span of Apprehension and Backward Masking tasks. The Span of Apprehension paradigm attempts to evaluate the number of items that can be attended to at one time. Typical experiments involve the participant searching an array of briefly presented visual items for a

particular target. People with schizophrenia generally detect significantly fewer target stimuli than healthy controls (Asarnow and MacCrimmon, 1978, 1981; Nuechterlein et al 1992).

Backward Masking consists of the brief presentation of a simple target stimulus, which is followed by the presentation of a 'masking' stimulus. When the interval between presentations of the two stimuli is less than 100ms, most people are unable to identify the target stimulus - it has been 'masked' by the second stimulus. As the time between the presentation of the target stimuli and the mask is increased, the target stimulus is more easily identified. People with schizophrenia seem to require a longer time interval between the presentation of the two stimuli in order to identify the target than normal controls (Green, Nuechterlein, Breitmeyer and Mintz, 1999; Braff and Saccuzzo, 1985).

3.7 Sustained attention

Sustained attention or vigilance may be defined as 'a state of readiness to detect and respond to certain small changes occurring at random intervals in the environment' (Mackworth, 1948). The most widely used measure of sustained attention in clinical research is the Continuous Performance Test. In this task stimuli are briefly presented one at a time over a period of several minutes and the subject is required to respond to target stimuli. People with schizophrenia make a greater number of errors in the form of both target omissions and false positive responses than normal controls (Serper, Harvey and Davidson, 1997).

3.8 Selective attention

Evidence from laboratory studies is consistent with clinical observations, and suggests that people with schizophrenia are more easily distractible than healthy controls, and thus have an impaired ability to attend selectively to target stimuli. Impaired performance on the Stroop test (Barch and Carter, 1998), dichotic listening tasks (Harvey and Pedley, 1989), negative priming tasks (Park, Lenzenweger, Pueschel and Holzman, 1996) and immediate serial recall tests (both with and without a distractor condition) (Weiss et al, 1988) indicate impaired selective attention in people with schizophrenia.

3.9 Common attentional problems

Clients often report having insufficient concentration to watch a whole film, to read a book, to follow a conversation or to complete simple tasks, for example. Selective attention is sometimes illustrated by the 'cocktail-party phenomenon': at parties, most people are able to listen to the person they are speaking to whilst a considerable amount of noise is going on around them. People with schizophrenia tend to be much more easily distracted by irrelevant noise or movement. On the other hand, they may also have difficulty in switching their attention to a new stimulus of their own accord.

3.10 Other cognitive targets in CIRCUITS

Whilst executive function, memory and attention are the main targets of CIRCUITS, there are a number of other important thinking skills for which CIRCUITS might be helpful. These include: thinking speed (which is frequently reduced in schizophrenia, and this has been shown to be detrimental for a

number of real-life outcomes, particularly work); language use (e.g. comprehension, verbal fluency); motor skills; attention to detail; and gestalt (or whole figure) processing.

Although each task has been designed with a particular cognitive function in mind, in practice, most tasks require a wide range of cognitive skills, and can be used to practice or learn to manage a number of cognitive functions. One of your tasks, as a therapist, is to help the patients learn which cognitive skills they find particularly difficult, and to target those problems repeatedly. Completing the task *per se* is not important – what is important is to practice and learn about the target cognitive skills. There is a brief guide in the CIRCUITS user's manual as to which cognitive skills are targeted by each of the tasks, but it is important that, as a therapist, you put some thought into which other cognitive functions may be demanded by each task.

4. The efficacy of CRT

The most recent meta-analysis by McGurk et al (2007) of 26 trials of cognitive remediation therapy shows that:

- there is a moderate effect of CRT on cognition (0.41)
- a moderate effect on psychosocial functioning (0.36)
- a small effect size on symptoms (0.28)

The effects of cognitive remediation on psychosocial functioning were stronger in those studies that provided additional psychiatric rehabilitation than where CRT is provided alone and so we recommend that CRT is used as part of a comprehensive rehabilitation programme.

5. Who can benefit from CIRCUITS?

CIRCUITS has been designed for working age adults with a diagnosis of schizophrenia or schizo-affective disorder. It is with this group of patients that CRT has been shown to be effective. There is some evidence to suggest that people with a schizophrenia diagnosis are vulnerable to significant cognitive decline in older age, and most CRT studies have not included people above the age of about 65. Therefore, it is not clear whether CRT may be of benefit to them.

CIRCUITS may be helpful for people under the age of 18, and whilst there is evidence to show that cognitive impairments are apparent in young people with a diagnosis of schizophrenia (and even before the onset of symptoms or a diagnosis is given), there may be other factors, not relevant for adults, which may affect their response to CIRCUITS. In particular, executive functions are some of the last cognitive functions to develop and may continue to improve into early adulthood. There is some evidence however that 16-18 year olds can benefit from CRT (e.g. Wykes et al, 2007).

Approximately three quarters of people with a diagnosis of schizophrenia or schizo-affective disorder demonstrate cognitive problems. CIRCUITS is unlikely to be suitable or relevant for people who do not experience cognitive difficulties, or who are neither concerned by cognitive problems nor find that they have a significant impact on their everyday life. For example, someone who has memory problems but who is able to maintain employment and leisure activities to their satisfaction, may not need CRT.

CIRCUITS is suitable for people with a wide range of disabilities associated with a schizophrenia diagnosis, from those with very high levels of disability and who need full-time support with daily living, to those who may be able to undertake paid employment and live independently. Experiencing positive, negative or disorganised symptoms does not prevent people from using CIRCUITS, although current florid psychotic symptoms may make it difficult for someone to use the programme. Other problems that may make it difficult for someone to engage with or benefit from CIRCUITS include having a head injury or an organic brain disease (e.g. dementia), severe substance or alcohol abuse, or moderate to severe learning disabilities (usually diagnosed in childhood). CIRCUITS may also not be suitable for people with literacy problems or difficulties in reading English.

6. Who can be a CIRCUITS therapist?

CIRCUITS can be delivered by a range of mental health professionals including assistant psychologists, clinical psychologists, occupational therapists, psychiatric nurses, psychiatrists, social workers and occupational therapists. Therapists do not need to be highly qualified or very experienced, but they do need to fulfil a number of important criteria. They should:

- (i) be able to interact calmly and empathically with people with severe mental health problems (including cognitive difficulties),
- (ii) be able to use a theoretical model and psychological principles to guide their clinical work,

- (iii) be able to understand and learn psychological models of relevant areas of cognitive function (executive functioning, attention and memory),
- (iv) be able to engage and work with patients with severe and enduring mental health problems on a one-to-one basis.

In addition, all therapists should receive regular clinical supervision from a Clinical Psychologist or another experienced mental health professional who has a good understanding of cognitive functioning problems in people with a diagnosis of schizophrenia and the relevant psychological models, and experience of using structured, formulation-driven therapeutic interventions.

7. How does CIRCUITS work?

CIRCUITS is an individual computerised psychological treatment, which can be carried out alone, or ideally, with the help of a therapist. It uses a variety of training techniques, such as scaffolding and errorless learning, which have been shown in empirical studies to lead to improved cognitive performance (see Wykes and Reeder, 2005, for a review).

It is designed to be carried out over forty sessions which take place on at least three days a week. Sessions should last for up to an hour, but concentrating for a prolonged period may not be possible at first, and the session length should gradually increase as clients' attention span improves. Therefore, sessions may only last for ten minutes at first. The CIRCUITS programme will suggest which tasks should be included in each session, but this can be over-ridden by the therapist or client, who can choose how long he or she spends on each session. Therefore, they can stop and start at the beginning and end of the CIRCUITS-

defined session, or work through the programme at their own pace. This is explained in more detail below and in the CIRCUITS user manual. This means that it may take more or less than 40 sessions to complete the whole programme and the client can choose to finish with the CIRCUITS programme before completing all tasks.

Sessions consist of a number of tasks (usually about 4 – 8) which target a range of cognitive problems. They use either verbal or non-verbal skills, or a mixture of the two. Tasks are juxtaposed to provide variety in terms of the cognitive skills they target and to be interesting and engaging for clients. There are two types of tasks within CIRCUITS: (1) abstract tasks, which use abstract material and which are designed to improve certain cognitive functions in an abstract context (e.g. remembering word lists), and (2) exercises, which are more complex tasks, which are designed to be more ecologically valid, by matching activities which might be carried out in everyday life (e.g. planning a journey or meal, reading a letter or remembering a shopping list). These tasks are listed in the CIRCUITS user manual. Abstract tasks appear throughout the CIRCUITS programme, but gradually a greater number of exercises are introduced within sessions, so that the later sessions mostly consist of exercises. The rationale for this is that clients learn new cognitive skills in an abstract context and that these are gradually incorporated into more real-life activities. The aim is for the client gradually to begin to transfer these new cognitive skills in everyday life.

There are up to 15 versions of each task, which gradually increase in difficulty as the client works through the programme. CIRCUITS also adjusts the difficulty level for individual clients, depending on their performance. Tasks are repeated to provide the opportunity for repeated practice of new skills and for improving metacognition in familiar contexts.

8. The CIRCUITS training principles

CIRCUITS is based on a number of training principles which have been shown in empirical studies to be useful in improving cognitive performance in people with a diagnosis of schizophrenia. These include errorless learning, scaffolding, massed practice and positive reinforcement, and are explained in more detail below. Using these techniques, the aim is for clients to engage target cognitive functions in every task attempted, and for clients to improve:

- (1) their understanding of cognitive in general,
- (2) their understanding of their own cognitive strengths and difficulties,
- (3) their understanding of and ability to use a wide range of cognitive strategies to improve their performance, and
- (4) their ability to reflect upon, monitor and regulate their own cognitive functioning.

These four aims can all be subsumed under a broader heading of improving metacognition.

8.1 Metacognition

Metacognition refers to 'thinking about thinking' (Flavell, 1979) and has frequently been divided into two subcomponents: knowledge about cognition

and regulation of cognition (Schraw and Dennison, 1994). Metacognitive knowledge includes knowledge about how the mind works in general, for example, the ways in which cognition can be made more or less efficient (e.g. using rehearsal may help to remember a telephone number), as well as knowledge about one's own cognition (e.g. my memory is poor). Metacognitive regulation refers to the process of monitoring and regulating someone's own cognition. Wykes and Reeder (2005) have suggested that metacognition is important in helping someone to transfer new cognitive skills to everyday situations, and it is a primary target for CIRCUITS.

Within the CIRCUITS programme, one of the key roles for the therapist is to help the client improve their metacognitive knowledge and regulation by encouraging them to reflect upon their own thinking processes and skills, the task requirements and their task performance. The programme itself also facilitates metacognition in a number of ways:

- (1) Clients are consistently asked to use strategies to carry out tasks from a suggested list or to generate their own strategies. They are then asked to rate how helpful they found each strategy at the end of each task.
- (2) Clients are asked to estimate how difficult they will find the task before they start. They are asked to rate how difficult they actually found the task at the end.
- (3) Clients are asked to estimate how long each task will take to complete before they start, and to compare this with their actual time at the end.

8.2 Errorless learning and scaffolding

Errorless learning was first developed for use with amnesic clients in whom implicit memory appears to remain intact whilst explicit memory is severely impaired (Baddeley and Wilson, 1994). Such a pattern of differential impairment is also apparent in people with a diagnosis of schizophrenia. Errorless learning appears to be effective because it avoids the implicit encoding of errors which cannot then be differentiated from correct information by explicit recall. Whilst errors are not avoided altogether in CIRCUITS, the aim is for clients to be performing at a level at which they are achieving a high degree of success. This not only promotes learning but is also positively reinforcing.

Scaffolding is similar to errorless learning in ensuring that clients work at a level just beyond their current level of competence, maximising accurate performance and minimising errors. The complexity of tasks is regulated by the CIRCUITS programme and the learner is encouraged to use established areas of competence, whilst help is provided with new aspects of learning.

The therapist can facilitate errorless learning and scaffolding by providing structure and help where necessary to ensure a high degree of success, and on some occasions, by allowing the client to skip tasks or complete only part of a task which is taxing or beyond their capabilities. A number of other techniques can also be employed:

- use directive questioning to ensure the participant reaches a correct or appropriate answer immediately, rather than encouraging erroneous reasoning;
- ensure the client sets off with the task at a manageable speed;
- ensure the client is using sufficient cognitive strategies to compensate for impairments;
- reduce the amount of information the client is faced with or shorten the task;
- provide adequate breaks to ensure the client's concentration is not over-taxed;
- provide help as soon as the participant begins to struggle with a task – do not leave him or her to flounder.

8.3 Massed practice

CIRCUITS relies on repeated practice by using numerous versions of the same task. The repeated use of a selection of strategies is also encouraged. Although sessions may be tailored to suit the individual (which may involve omitting tasks from some sessions), in general, therapists should ensure that a several tasks are included in each session, to make sure tasks are completed sufficiently frequently to allow for massed practice. Sessions should also take place on at least three days per week. Massed practice is helpful in:

- (a) allowing the participant to learn from previous experiences, since he or she does not need to recall tasks or strategies from more than a few days ago;
- and

(b) encouraging the participant to monitor his or her own performance and to note improvements.

8.4 Positive reinforcement

CIRCUITS is designed to ensure maximum success for participants. It is very important that success should be noted explicitly and frequently by the therapist and praised, in order to encourage the desired behaviour and to ensure completing CIRCUITS is a positive experience. The CIRCUITS programme tends to highlight accurate performance, but not errors. Referring to the scoring manual which is located in the CIRCUITS manual may also be useful to highlight improved performance.

8.5 Strategy use

One of the key aims of CIRCUITS is to teach people to use a variety of strategies to improve their cognitive functioning and task performance. It is hoped that through repeated practice, clients will gradually learn to use strategies spontaneously according to task requirements and their own strengths and difficulties. Strategies should be used in an increasingly independent way by the participant:

1. strategies should first be demonstrated (by the CIRCUITS demo or the therapist),
2. copied by the participant (with help and prompting from the therapist if necessary),
3. used overtly by the participant following reminders from the therapist,

4. eventually internalised by the participant so that he or she organises information and uses strategies to complete tasks without prompting from the therapist.

It is important that clients give each strategy a good trial and do not stray from using it once started, without explicitly evaluating its use and making a decision to try a new strategy. For every task, a range of strategies are suggested by the CIRCUITS programme, but clients should be encouraged to generate their own strategies and to discover which strategies are most helpful to them. For example, someone who is good at using visual and spatial information might opt in general for visuo-spatial strategies, such as using imagery, rather than strategies which rely on verbal skills. Some common useful strategies include:

1. *Verbalisation* of cues, prompts and strategies relating to the task in hand. Verbalised prompts are often used very repetitively, in an increasingly independent way as therapy progresses, and following these steps:

- the verbalisation is demonstrated (by the CIRCUITS programme or the therapist),
- the participant overtly verbalises with prompts from the therapist,
- the participant overtly verbalises without prompts from the therapist,
- the participant verbalises covertly (i.e. quietly to him or herself) by the participant with or without prompts from the therapist.

For example, in the Learning a list task, the therapist may encourage the client to repeat the list of words over to him or herself.

2. *Information reduction*: in tasks in which participants are confronted with large amounts of information, the risk of overload can be reduced by covering up

some of the material. The computer will frequently offer the client the option to reduce what can be seen on the screen in some way.

3. *Breaking the task into smaller steps*: for complex tasks, or when participants are easily overwhelmed or are very disorganised, tasks can be broken down according to component parts, so that the participant only partially completes the task, or completes the task a step at a time. The computer frequently offers options to use this as a strategy but the therapist can also help by suggesting only parts of a task are completed or focused upon.
4. *Simplifying the task*: tasks instructions or expectations can be simplified to a level appropriate for the client. Tasks can also be simplified by making them shorter (i.e. finishing the task before it is complete), breaking them into steps, including verbal or written prompts, and encouraging strategy-use.
5. *Providing written prompts*: these can be used to keep track of task instructions (e.g. a frequent strategy offered by the computer is to use a notepad which appears on screen), to monitor the current place in the task, or to record information in ongoing use.
6. *Chunking*: information can be remembered, understood or manipulated more easily if it is divided into manageable chunks.
7. *Rehearsal*: information is more easily remembered if it is repeatedly rehearsed.
8. *Use of mnemonics*: mnemonic strategies (such as using the first letter of each word to be remembered to make another word in 'Learning a list'; making up stories using the to-be-remembered information) are helpful in remembering new material.

9. *Categorisation*: categorising to-be-remembered information can facilitate memory.
10. *Organisation*: this can make information more manageable, and aids memory. It may include strategies such as ordering information, restructuring the task and so on.
11. *Planning*: before most tasks, participants can be asked to devise a number of strategies or plans to ensure the task is carried out effectively. They are then asked to evaluate the plans, implement their chosen plan and to monitor its success.

This is not an exhaustive list of strategies, and the therapist must be prepared to be creative in identifying techniques which may be useful for different participants. For example, with someone who can be disorganised and talkative, the therapist might suggest a time limit for each task, which is monitored by the therapist and client together, to help focus the client on the task in hand. At the end of each task, the client might then be given a short period of time to talk about a topic of his or her choice.

Teaching strategy use is paramount throughout the CIRCUITS programme. It is also very important that tasks are done in a manner which is organised and well-controlled, and that the target skills are emphasised. Accuracy of performance on each task is always of secondary importance to an organised and strategic style for carrying out the task.

9. The role of the therapist in CIRCUITS

9.1 The therapeutic relationship

As with any psychological intervention, the therapeutic relationship between therapist and client is very important. In a recent study conducted by service users, questioning people who had received a pencil and paper version of CRT, one of the most important and positive aspects of the experience reported was developing a good relationship with their therapist (Rose et al, 2008). Although its development will rely on many of the usual clinical skills of a therapist, we would like to make a few specific suggestions about the ways in which the therapeutic relationship for CIRCUITS may differ.

A normalising stance towards cognitive skills and difficulties is generally helpful, and the therapist may wish to use judicious self-disclosure about his or her own cognitive strengths and weaknesses. Although the aim is for the therapist and client to take a collaborative approach to tasks, the therapist may need to offer a good deal of structure to the client, by using directive questioning, demonstration and frequent help and prompts in order to keep the cognitive load within manageable limits. Restricting the use of long wordy explanations, and using lots of demonstration instead can also be helpful in this respect. The therapist-client relationship may be more akin to that of student-teacher than is usual in mental health settings, and therapists have often reported adjusting their own therapeutic style accordingly. This relationship frequently offers a rewarding opportunity for the client and therapist to communicate in a setting that is not focused on symptoms, emotions or distress, but on activities and behaviour which are relatively normative (relating to education or work) and

non-affective in content. That is not to say that a focus on cognitive problems cannot cause distress, particularly for clients who may have had difficult experiences at school, college or work.

9.2 Engaging clients in CIRCUITS

CIRCUITS is designed to provide a positive and rewarding experience for participants in which they received frequent feedback about their performance and their success is highlighted. It is also pitched at a level which is manageable for people with a wide range of abilities. We hope that these factors help to engage participants. In our experience, patients are often painfully aware of their own cognitive problems, and find these easier to discuss than 'symptoms', and they are often pleased to have the opportunity to try to improve them. However, here are some ideas of other things that may facilitate engagement:

- (i) Take a normalising stance towards cognitive problems, explaining that everyone has a unique profile of strengths and difficulties, and that cognition can be adversely affected by numerous factors, including age, experience, mood, use of medication, education, illness and so on.
- (ii) Discuss the possibility that cognitive difficulties may help to explain some of their problems in carrying out activities of daily living (such as holding conversations with other people, carrying out everyday tasks such as shopping, cooking and so on). It may also be helpful for the therapist to discuss how each CIRCUITS task relates to everyday life as the client progresses through the programme.

- (iii) Offer the client a neuropsychological assessment prior to receiving CRT, and discuss the cognitive strengths and difficulties that this uncovers, how these may affect them in everyday life, and how they may be targetted by CIRCUITS.
- (iv) Help the client to set personal goals for therapy, which can be monitored in everyday life (e.g. attending an evening class, being able to watch a complete film, being able to follow a telephone conversation).
- (v) Many clients report finding the analogy of working on CIRCUITS as like going to a 'mental gym' helpful. The idea is that the brain can be thought of as like a muscle which needs to be repetitively exercised to maintain and improve strength and agility.
- (vi) Use frequent accurate positive reinforcement and review improvements together (both within the CIRCUITS programme and in everyday life); draw attention to strategies the participant spontaneously adopts.
- (vii) Make sure that sessions are kept to manageable length, with sufficient breaks, and include a variety of tasks which are sometimes challenging and sometimes easy for the participant. In our experience, if CRT is not well-tailored to the individual's cognitive abilities, people are more like to discontinue with therapy.

9.3 Facilitating the transfer of new cognitive skills to everyday life

While there might be some cognitive improvements which are easily transferred to new everyday situations with little conscious thought (e.g. increased attention span), many of the new skills and strategies learnt through doing CIRCUITS will require deliberate and thoughtful planning if they are to be effectively used in

everyday activities. Wykes and Reeder (2005) have suggested that metacognitive knowledge and effective metacognitive regulation are crucial for this transfer of information. A person needs to understand in which situations he or she is likely to have difficulties or has room for improvement, to know what to do to make some improvements (i.e. has metacognitive knowledge) and to monitor and regulate their thinking in order to make these changes (i.e. use metacognitive regulation). It is for this reason that metacognition is a key target for CIRCUITS. There are a number of other things a therapist can do to facilitate effective transfer of new cognitive skills to everyday life.

(1) When working through tasks, discuss how each one might relate to everyday activities. This may require some imagination for abstract tasks, but the exercises are designed to mirror everyday activities. There might also be other different everyday activities (not highlighted in the exercises) that the cognitive functions may be used for.

(2) Take everyday activities as a starting point (particularly those related to a client's goals) and discuss which cognitive functions may be required and which tasks may involve these functions.

(3) Discuss with the client how he or she might use new cognitive strategies in their everyday activities. Consider involving other people who work with the client (e.g. other mental health professionals) or known him or her well (e.g. family) in this. For example, new cognitive strategies might be incorporated into an OT programme.

There is a growing body of evidence to suggest that doing CRT prior to or in combination with other rehabilitation programmes can be helpful in improving

the response to the rehabilitation. It may be that following CRT there is a window of opportunity for clients to make good use of other learning opportunities, and planning for activities which may coincide with or follow participation in the CIRCUITS programme may form a useful part of goal planning.

9.4 Tailoring sessions

While the CIRCUITS programme will suggest tasks to be completed within each session, this does not need to be adhered to and sessions should generally be planned so that they last for a manageable length of time. At the beginning of therapy, many clients may only be able to manage ten minutes of therapy, and this can gradually be increased over time. The aim is for sessions to eventually last about an hour. Even participants who have a good concentration span may need shorter sessions at times, depending on their mood, energy levels and so on.

Rather than just working through the computer generated sessions at an even pace, the therapist can intervene by:

- (a) skipping tasks (see below for details about how to do this);
- (b) suggesting some tasks are completed thoroughly and in full, whilst others are done with less rigour or ended before they are finished;
- (c) repeat or restart some tasks to avoid confusion or to practice difficult aspects;
- (d) suggesting that the therapist and client review past scores or re-read parts of the manual on occasions to break up the session;

- (e) ensuring that the client is offered sufficient breaks in the session;
- (f) suggest some tasks are completed in the client's own time for homework (assuming he or she has access to a computer – see below for details about how this is done).

It is useful for sessions to include a number of tasks to ensure sufficient variety to maintain the client's interest and to that a range of cognitive functions are employed and practiced.

9.5 Tailoring tasks

Changing the focus of tasks

Although the aim of each task is clearly explained in the CIRCUITS programme, they may be used differently or be given a different focus on separate occasions. For example, in the 'Learning a list' task, clients are asked to categorise to-be-remembered items in order to help with encoding. It may be that on some occasions, the entire focus of the task could be on the categorisation process, rather than the deliberate encoding of the items. The recall phase could then be skipped or treated as an incidental (i.e. unplanned) recall. The therapist should feel able to creative in his or her use of tasks and strategies in this way.

Using the strategy selector box

At the beginning of each task, the client is asked to select a strategy from a pre-defined list. He or she is unable to begin the task without selecting a strategy. Some tasks will provide additional resources to complete the task (e.g. a grid or a ruler) and some may constrain the way in which a task is done (e.g. a strategy

of working from left to right might result in the client being only able to choose responses in that order). For some strategies, the computer will do nothing. Each strategy is demonstrated when you click on the demo button to the left of the strategy in the strategy selector box. The therapist can also encourage the client to use additional strategies not suggested in the CIRCUITS programme. The aim is for the client to consistently select, implement, monitor, evaluate and adjust where necessary, a variety of strategies in numerous contexts, and for this process to become familiar and spontaneous. It is helpful if the therapist encourages the client to use a strategy consistently while they go through the complete process of selection, implementation and evaluation for strategies, rather than switching between strategies rapidly without much thought. Ideally, by the end of CIRCUITS, the client should have identified a number of strategies which make use of their cognitive strengths, which are helpful in supporting or compensating for cognitive difficulties, and which they can use in a wide variety of situations. For example, someone who has well-developed visual skills might develop visualisation as a strategy to be used in remembering new information, planning a response to a problem, helping him or her to focus attention etc.

Levels of difficulty

There are at least 12 versions of each task within the CIRCUITS programme, but in general, participants will complete only 8 or 9 versions of the task. These versions gradually increase in difficulty as the programme progresses, but the computer also adjusts the difficulty level for individual clients by moving them on to higher levels of difficulty if they are scoring above a certain threshold. At the

final level of difficulty for each task (which some clients will not reach during the 40 session programme), the strategy selector box will no longer appear and clients will be expected to select and implement strategies without prompting from the computer. The difficulty levels are not necessarily the same between tasks, so the strategy selector box may still be available for some tasks, whilst it is hidden for others. For the tasks for which the strategy selector box no longer appears, the client may need therapist help to continue to select, implement and evaluate strategies in an organised and systematic way.

Timing tasks

Throughout all tasks, a clock is visible on the screen which records the time taken for each task. The client is also asked to estimate the time it will take them to complete each task beforehand, and to compare this to the actual time taken at the end of the task.

Some tasks are constrained in their timings and the client must respond to computer-generated stimuli. However, for many of the tasks, this is not the case, and the client is left to work at his or her own speed. For these tasks, when the client has reached a level of competence at which they are able to carry out the task without too much reference to the task instructions, you may wish to consider introducing the possibility of the client trying to improve his or her speed in carrying out the task. In our experience, many clients actually become slower in completing tasks as they begin CRT, as they become more reflective and strategic about their work and they implement plans before making a start. This is to be encouraged. However, speed of processing is also

an important cognitive function, and participants may benefit from being encouraged to increase their thinking and response speed. As a therapist, you may wish to balance the extent to which clients are encouraged to focus on completing tasks quickly and completing them systematically and in an organised way. Ideally the two should go hand in hand, but it may be that the focus needs to be different for different tasks and in different sessions. Setting up games, competitions and targets may be useful in incorporating a time aspect to a particular task.

Using competition

Using gentle competition is an additional way to introduce variety and new motivations for completing tasks. Participants may be encouraged to beat their previous scores for example, or even to beat the therapist's attempt at completing a task. Asking a client to monitor the therapist's performance on a task is often a useful exercise, as many of the target cognitive skills are required to follow and evaluate another person's performance. The therapist may at times suggest that the participant acts as the therapist and offers instruction, help, prompts and feedback where necessary.

9.6 Improving metacognition

A primary consideration for the therapist throughout the CIRCUITS programme is to encourage the development of clients' metacognitive regulation and knowledge. One of the ways in which this can be done is for the therapist to initiate and maintain a metacognitive dialogue throughout the sessions. Here

are some examples of the types of issues that might be raised in such a dialogue:

(1) how difficult or easy the client finds certain tasks and / or cognitive functions.

It may be particularly useful to identify general themes or broad areas of cognitive strength and difficulty (e.g. is the client better with verbal or visual information, attending to detail or seeing the whole?);

(2) which cognitive functions are being used in tasks; for example, it might also be useful to think through, before starting a task, what it might involve. Later, the client could check their predictions against their experience of actually doing the task.

(3) how the client did or is doing a task. This may involve reflecting on deliberate strategy use, but may also involve reflection on whether any strategies were adopted spontaneously, what their thinking process was etc.

(4) the client's estimation of the accuracy or quality of their own performance; at the end of tasks, this can be compared to their actual score.

(5) how tasks and / or cognitive function relate to activities of daily living;

(6) the time it takes to carry out tasks. This can be discussed in terms of predictions, estimations about current timings and then evaluation relative to actual timings at the end of tasks.

(8) which strategies are effective and how they can be modified and improved.

The aim is for clients to become confident in monitoring and regulating their own thinking style and processes and to learn about their own cognitive strengths and weaknesses and how they can compensate for, support or improve them. These abilities are hypothesised to be helpful in facilitating transfer of new cognitive skills to activities of daily living. In order for the therapist to be able to

focus on metacognitive aspects of the client's experience, it may be helpful for the therapist to be familiar with the CIRCUITS programme and tasks. It is therefore advisable to work through a number of sessions for yourself, before embarking on a CIRCUITS programme with a client.

10. Using the therapist controls

10.1 The village

The CIRCUITS programme is based around a 'village' which forms the starting point of the programme and each session. The client also returns to the village at the end of each task. Different activities take place within different buildings within the village. Within the library, four books are located: 'Help' (the CIRCUITS user manual), 'Your score' (which summarises the client's score for all tasks completed to date), the 'CIRCUITS history' (which gives a brief summary of the development of CRT and CIRCUITS) and the 'Credits' (which lists the people responsible for the design, production and funding of CIRCUITS). All abstract tasks take place within the school. The exercises take place in a relevant building (e.g. tasks relating to shopping take place in the supermarket).

The therapist login

When you first enter the village, the user login will appear. Click on the 'therapist login' to log in as a therapist. At other places in a programme which is being run by a client alone, you can go to the therapist login by clicking on the 'T' button at the top right hand side of the screen.

Synchronising your data

When the CIRCUITS programme has been started through the START menu of your computer (rather than through an internet link), a 'Synch' button will appear with the therapist login. This allows you to upload all the data you have collected whilst working with clients to the internet version of CIRCUITS, and to download any data you might need from the internet CIRCUITS (which may be computer-generated data or data from other therapists working with the same client). Click on the 'Synch' button, enter your username and password and click 'OK' to synchronise your data. The name of the remote server should be set by default. N.B. This should be done (a) each time you work on a computer which has previously been used by a different therapist, and (b) if you have made any changes to a CIRCUITS programme (using the Therapist Administration System – see below for details) online that needs to be transferred to your computer. Ideally, you should aim to synchronise once a day, to avoid losing data, but the programme can be run offline until the data need to be uploaded to the internet for one of the reasons above.

10.2 The therapist administration page

When you have logged in, you will be taken to the therapist administration screen. You will be offered options, (1) Go to village, (2) Client view, and (3) Test view. The current viewing screen will be shown in bold. Click on the alternative blue view to switch viewing screens.

(1) Go to village

If you choose 'Go to village', you will return to the village and the session will continue from where you left off.

(2) Test view

Click on this link to see a list of all the CIRCUITS tasks. Click on each task to see a list of all the available versions of that task. Click on an instance of the task to test it. This gives you the opportunity to try tasks for yourself (or with a client) without affecting the client's scores or collected data.

(3) Client view

Here, all the clients you are working with are listed. Click on the name of the client whose tasks you wish to view or adjust, or to login that client. You will then see:

- (a) The name of the client. (You can click on the 'log off' link to return to your full list of clients).
- (b) The current therapy programme you are using (this will usually be the 40 session full therapy programme. For alternative programmes, please contact the Institute of Psychiatry). (You can change the programme to an alternative which has already been allocated to that client by clicking on the 'Change' link.)
- (c) The current session number.
- (d) The next task in the current session.

Below this, you will see a list of all the tasks in the current programme for that client. At the bottom of the list, there is a list of page numbers you can click on to view later parts of the programme.

On the left, you will see the session number for each task. The 'task' is the generic name for that task. The 'task instance' is the particular version of this task allocated for this session. The 'status' will tell you whether this task

instance has been completed, is new (i.e. not yet complete), or has been skipped.

Tasks can only be skipped by you, the therapist. This is done by clicking on 'Skip' to the right hand side of the task. You can start reset the task by clicking on 'reset'.

Setting homework

You can allocate a task to be completed for homework by clicking on 'homework'. This task will then appear on the homework list on the right hand side of the page. You can remove a task for homework here. When you have a complete list of tasks you wish to allocate for homework, click on 'Save homework'. This will bring up a 'save as' screen which will allow you to save the tasks on to a memory stick to give to your client to for homework use. To view a client's completed homework, click on 'Report homework results'.

Moving on from the 'Client view' screen

To continue with the CIRCUITS programme, click on the 'Go to village' link. When you return to the village, the session will continue from the first available task that is not complete or has not been skipped.

When you are working online, there will also be two links available in the grey bar at the bottom of the screen. These are not available when you are working offline. The second of these two links ('Open System Administration Application') will not be available to most therapists, as this enables you to

change the task content. The first of the two links ('Open Therapist Administration Application') will take you to the Therapist Administration Application. This will allow you to view and access all clients and therapists within your organisation. See below for further details about how to use this system.

10.3 The Therapist Administration System

On opening this system, on the left hand side, you will see 'Clients' and 'Therapists' boxes.

(1) CLIENTS box

Within this box, click on 'My clients' to view a list of all the clients you are currently working with. You will see their name or reference (for confidentiality), their user name and whether they are currently active on your system.

Registering a new client

Click on 'Actions' at the top right of the page, and then select 'Register a new client'. Fill in client's name or reference and your name will appear as the therapist. Choose a username and password for the client and record whether or not they should be active on your system. When they log in later, they should type in 'username-password'. Finally, click on 'Save' to save the information.

Editing the details of an existing client

Click on the client's name. Choose 'Edit client' from the drop-down 'Actions' menu to change the client's name, therapist, username, password or whether or not they are active on your system. Then press 'Save'.

Changing the CIRCUITS programme the client is working on

Choose 'Start therapy program' from the drop-down 'Actions' menu to choose a new therapy programme for the client. Select a programme from the drop-down menu and then click on 'Start'. More than one programme can be allocated to each client at once, but only one programme can be current. Change which programme is current by choosing 'Set current therapy programme' from the right hand 'Actions' drop-down menu, then select from the drop-down menu of available therapy programmes. End a therapy programme by choosing this function from the 'Actions' drop-down menu.

Viewing tasks and scores for each client

Below the client's details in the 'View client' screen are three tabs: (1) General, (2) Program and (3) Task result log. Click on each tab to move between them.

Under 'General', you will see the log in code and a list of all CIRCUITS programmes allocated to that client and their status (current, finished or parked i.e. not current).

Under 'Program', select the programme you wish to view from the drop-down menu. This will show the complete list of tasks for that programme and the status of each task (i.e. new, complete, skipped).

Under 'Task result log', select the programme you wish to view from the drop-down menu. All tasks within that programme will then be listed, along with the date they were started, their status (i.e. whether or not complete) and the score.

Viewing other therapists' clients

Within the left-hand 'Clients box', click on 'All clients'. This will display a list of all clients allocated to all the therapists within your organisation. You can view these clients' details, tasks and scores etc, but you are not able to edit them in any way. You are also not able to allocate clients to another therapist.

(2) THERAPISTS box

Click on 'All therapists' within this box to see a list of all therapists within your organisation. Click on each therapist's name to view their details (under the 'General' tab). Click on the 'clients' tab to view their list of clients.

You are not able to edit anything in this box.

10.4 The therapist buttons

When you are in the village, click on the 'T' button in the top right hand corner at any time to return to the therapist administration page.

Once you begin a task, clicking on the 'T' button will now activate three therapist controls:

(1) DRAW button

Click on this button to allow you to draw on the screen with your mouse. Click again to delete your marks.

(2) RESET button

Click on this button to restart the current task. You will be taken back to the 'start' page for that task.

(3) PRINT button

Click on this button to bring up a print screen. Select your printer and the number of copies and then click on 'Print' to print the current screen page.

10.5 Beginning with CIRCUITS

You are now ready to begin as with CIRCUITS! We hope you enjoy it!

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