Cognitive Remediation Therapy

CIRCuits
Outline

- What is CRT and CIRCuiTS?
- Aims of the course
- Cognitive impairment in schizophrenia
  - What is impaired?
  - Why try to improve thinking skills?
- Research findings on CRT
- CIRCuiTS
- Training Techniques
- Clinical Issues
What is Cognitive Remediation Therapy (CRT)?

• Is a psychological therapy
• Designed to improve cognitive or thinking skills
• Such as: attention, memory, executive functioning
• Cognitive improvements assumed to benefit social functioning and symptoms
• Usually provided in addition to medication
• Given to individuals or groups
• By computer or by a therapist
• Using strategies or practice or both
• Involves training
What is CIRCuiTS?

Computerised Interactive Remediation of Cognition – Training for Schizophrenia

• CIRCuiTS is one type of cognitive remediation therapy. It’s a computer-based way of delivering CRT.
• Designed to be used with a therapist – but also stand-alone
• Follows an evidence based protocol
• Tailored to individual strengths and weaknesses
Participants Aims:

- What service do you work in?
- How do you hope to use CRT?
- Main aims from course?
My Aims Are To:

• simply describe the theoretical background to CRT
• give you an understanding of the target cognitive skills and how they may relate to everyday living skills
• teach the core skills needed to administer CIRCuiTS and to give you practice in a wide range of the tasks
• think about practicalities of CRT
• give enough working knowledge of CRT for you to be able to go back to your workplace and make a start!
Vignette

Ken
What cognitive problems do people with schizophrenia have?

- What cognitive impairments may help to explain Ken’s difficulties in daily life?

- What other explanations may be given for his problems (by relatives, doctors, carers etc)?
Ken’s cognitive problems

- Reasoning difficulties (e.g. ‘jumping to conclusions’)
- Self-monitoring problems
- Attentional difficulties
- Poor memory
- Poor social cognition
- Self-initiation problems
- Sequencing problems
- Difficulty planning
- Cognitive inflexibility
- Cognitive ‘overload’
What other explanations are sometimes given for cognitive problems?

• Lack of motivation
• Laziness
• Paranoia
• Negative / positive symptoms
• Institutionalisation
• Depression
• Lack of effort
• Anxiety
Cognitive deficits associated with schizophrenia

• General intelligence
• Attention
• Long-term and working memory
• Problem solving
• Planning
• Executive functioning
• Language comprehension
• Motor function
Executive problems

• Impulsivity
• Difficulty initiating responses
• Failure to develop or maintain a strategy
• Perseveration
• Disorganisation
• Disinhibition
• Distractibility
• Failure to check or monitor behaviour - lots of errors which are not corrected
• Failure to maintain set
Summary

- Long term memory
- Attention
- Concentration
- Executive function
  - Planning
  - Flexibility of thought
  - Working memory
Cognitive deficits: Are they important?
Cognitive deficits are important because:

- People who have a diagnosis of schizophrenia think they are important
- Are associated with poor functioning
- Seem to interfere with the success of other treatment programmes (CBT for psychosis, perhaps OT?)
Cognitive deficits are important because:

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First episode

“I was looking at A or B for some subjects now I’m looking at C or D if I’m lucky.”

“Memory loss is the new thing that’s bothering me.”

“I have low concentration”

“I’m coming to terms with the fact that I have got a learning difficulty.”

Michael, Aged 16 years
Inside my head - Channel 4, June 2002
During an episode

“Where did all this start and could it possibly have started the possibility operates some of the time having the same decision as you and possibility that I must now reflect or wash out any doubts that’s bothering me ……”

From Wykes and Leff, 1982
“My concentration is very poor. I jump from one thing to another. If I am talking to someone they only need to cross their legs or scratch their head and I am distracted and forget what I was saying.”

McGhie and Chapman, 1961
Cognitive deficits are important because:

• People who have a diagnosis of schizophrenia think they are important

• Are associated with poor functioning

• Seem to interfere with the success of other treatment programmes (CBT for psychosis, perhaps OT?)
The importance of cognitive deficits

• A primary feature of the disorder schizophrenia

• Associated with:
  ➢ Getting a job
  ➢ Social functioning
  ➢ Ability to care for yourself
  ➢ How much care you need

McGurk And Mueser, 2004; Green et al 2000 etc etc
Cognitive variables (in yellow)
Memory, Attention, Flexibility, Learning

What did symptoms add?  Nothing
Social functioning

- What effect do positive symptoms add?
- NOTHING
Life Skills

Velligan et al 1999

Cognition

Positive symptoms

42%

Negative symptoms

Life skills
Thinking, symptoms and outcomes

Cognition

Positive and/or negative symptoms

Occupational Functioning

Social Functioning

Life Skills

Dependence on psychiatric care
Thinking, symptoms and outcomes

Cognition

Positive and/or negative symptoms

Occupational Functioning

Social Functioning

Life Skills

Dependence on psychiatric care

Perlick et al, 2008
Learning from service users

“I want to be able to do things that other people do, like have a boyfriend and a job…”

Vocational Functioning

“I want to have friends”

Social functioning

“I want to be able to cook and eat when I want”

Life skills

“I want to live in my own place not a hostel”

Dependence on services
Cognitive deficits are important because:

• People who have a diagnosis of schizophrenia think they are important

• Are associated with poor functioning

• Seem to interfere with the success of other treatment programmes (CBT for psychosis, perhaps OT?)
Maybe these kinds of deficits are just symptoms of the illness?

Not the case:

• Start early – before onset
• They predate the onset of symptoms
• Are present throughout the course
• Persist even when symptoms are absent
• Interfere with functioning outcomes
• Not related to medication
Medication

• Atypical antipsychotic improved overall cognitive dysfunction compared to the typical antipsychotics
  – Learning and processing speed domains were significant

• Even with the pharmacological treatment, patients still showed cognitive impairments
Does it Work?
Meta-analysis of CRT Studies

• A meta-analysis combines the results of several studies that address a set of related research hypotheses.

• A meta analysis is where data from a number of studies are lumped together in order to provide evidence for or against a hypothesis.
Meta-analysis of CRT Studies

Data Sources:
Electronic databases (Embase, Medline, Current Contents, Web of Science, PsychInfo, and Cochrane Register)

Search Terms: COGNITIVE, TRAINING, REMEDIATION, CLINICAL TRIAL AND SCHIZOPHRENIA
Meta-analysis of CRT studies

- Studies had a random allocation procedure
- CRT vs any control
- At least 70% participants had schizophrenia diagnosis
- Contact with all major contributors
- 40 treatments in 39 trials in 109 reports
- Authors:
  - Til Wykes, Vyv Huddy, Caroline Cellard, Susan McGurk, Pal Czobar
Does it work? Yes!

Effect size (d)

<table>
<thead>
<tr>
<th>Cognition</th>
<th>Function</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td>18</td>
<td>20</td>
</tr>
</tbody>
</table>

Wykes, Huddy et al. submitted
Is it durable?
Data at 6 months (average)

Effect size (d)

Post treat
Durability

*Symptoms not significant

<table>
<thead>
<tr>
<th></th>
<th>Cognition</th>
<th>Function</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>41 (11)</td>
<td>0.5</td>
<td>0.45</td>
<td>0.2</td>
</tr>
<tr>
<td>18 (12)</td>
<td>0.45</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>20 (8)</td>
<td>0.4</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Is CRT acceptable to service users?

- 85% of trials have a drop out rate of less than 20%.

- Average 5% therapy drop out overall.

- Rose et al. (2008) participatory study:
  
  - CRT is acceptable and valued.

  - But side effect. benefits of CRT on self esteem were linked with improvement on tasks...if clients felt they hadn’t improved self esteem scores were lower.
And *therapy characteristics*?

- Little evidence of effects on *cognition outcome* with:
  - comparison against active control treatment
  - Variable dose (intensity or length of therapy)
  - Approach (strategy based or drill / practice)
  - When adjunctive rehabilitation included in the package of care

- But for the functioning outcomes >
But therapy effects on functioning....
But therapy effects on functioning....

Effect size

Those with psychiatric rehabilitation (N = 4)
CRT: Summary

- Moderate - and durable effect - on cognitive skills
- Cognitive improvement *generalises* to moderate effects on functioning

- Larger effect on functioning outcomes when
  - a strategy training approach was used and
  - in particular when combination with a rehabilitation package

- Negligible effect on symptoms
Cognition and Strategy Use

• We all have some cognitive difficulties in everyday life (e.g., difficulty in following a movie)
  – Find easily strategies to help us to cope with these problems

• People with schizophrenia: magnitude of the deficit is higher, no strategies used
  – May lead to severe problems if not treated
- Orange
- Yellow
- Sausage
- Car
- Kids
- Violet
- Puppy
- Paper
- Toast
- Egg
- Tiger

- Red
- Panda
- Lorry
- Orangutan
- Computer
- Baby
- Blue
- Boat
- Children
- Table
- Chair
• What strategies did you use to learn the list?

• If you didn’t use a strategy what stopped you from using one?

• How was your performance with/without a strategy?
CIRCuiTS
Computerised Interactive Remediation of Cognition – Training for Schizophrenia

Wykes, Reeder, Bjorklund, 2010
Why use a computer?

• Visually appealing
• Normative, valued by users
• Interactive: lower therapist demand
• More adaptable
• Tracks process and progress
The Programme

- Computerised software
- 40 sessions
- Takes place on at least 3 days per week
- 5-8 tasks per session (recommended up to an hour)
- Explicitly teaches and practises information processing strategies (i.e. healthy thinking skills) throughout
- Tailored to individual level - increasing difficulty gradually
- Sessions recommended by CIRCuTS but may be overridden by therapist
What are its aims?

- To use the tasks to practise the target skills
- To teach strategies which the individual will then use to facilitate target skills
- To encourage the transfer of cognitive skills to everyday life
- To develop thinking awareness (metacognition)
CIRCuiTS Development

• **Service users** have been involved in the development of the:
  – Design
  – Music
  – Sounds
  – Difficulty levels

• **Service users** have also given feedback on:
  – Attractiveness
  – Cultural issues
  – Engaging nature of the tasks

• **Therapists** have
  – Tested the system by building individualised programmes
  – Rated attractiveness etc
How is the programme put together?

- Two types of tasks:
  - Abstract
  - Exercises
- Abstract tasks dominate early sessions
- Exercises appear later in the programme
- Each stage covers a range of cognitive functions
- Tasks gradually increase in difficulty
- Difficulty level also moderated by computer using artificial intelligence
Abstract tasks

• Neutral content

• Specific cognitive targets

• Appear early in the programme

• Often form part of the later exercises
Abstract task

Type Your Answer Here:

what is your favourite colour
Which small images are included in the big one?

- Square
- Circle
- Hexagon
- Triangle
- Octagon
- Pentagon
- Diamond
- Star
- Scalene Triangle
An Exercise

• Ecologically valid – map on to real-life activities

• Mainly reliant upon multiple executive functions

• Fall under functioning categories:
  – Work
  – Social situations
  – Cooking and shopping
  – Travelling
You're a post-office worker. Plan your day.

**To Do List...**

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lunch</td>
<td>Lunch with Margaret. She needs to be finished by 1pm.</td>
</tr>
<tr>
<td>Sort</td>
<td>Sort the mail before its loaded onto the lorry.</td>
</tr>
<tr>
<td>Collect mail</td>
<td>Mail arrives at about 9.30am.</td>
</tr>
<tr>
<td>Load lorry</td>
<td>Load external mail on to the lorry at 4.30pm.</td>
</tr>
<tr>
<td>Deliver internal mail</td>
<td>Needs to be delivered before lunch.</td>
</tr>
</tbody>
</table>

**Today's Diary**

- **8:00 am**
- **8:30 am** Breakfast
- **9:00 am**
- **9:30 am**
- **10:00 am**
- **10:30 am**
- **11:00 am**
- **11:30 am**
- **12:00 pm**
- **12:30 pm**
- **1:00 pm**
- **1:30 pm**
- **2:00 pm**
- **2:30 pm**
- **3:00 pm**
- **3:30 pm**
- **4:00 pm**
- **4:30 pm**
- **5:00 pm** Time to go home
Curriculum Vitae

Name: Rita Scooter
Age: 40 years

I am an experienced teacher and have worked with children aged 5-10 years. I am looking for a job working with this same age group. I live in North-East London and need to find something local to home (preferably North or East London). I would prefer to teach English or History, but definitely not Maths.

Circuits weekly

Job vacancies

Teacher Wanted
Maths Teacher Required

Teacher Wanted
History Teacher Required

Teacher Wanted
English Teacher Required

Teacher Wanted
Biology Teacher Required
Instructions
You are hand-delivering some letters to your local church group members. The first stop is the office blocks. Stop at the station nearby.
The Village

• CIRCuiTS homepage
• Point of return between each task
• Library:
  – Scoring
  – Help
  – Credits
  – CIRCuiTS history
You are in session 2.
There are 5 tasks left in the session.
Your next task is Codes.
The Library

• Has books on:
  – Background
  – History of CRT

• Therapist’s manual

• Individual scores and strategy use
How do you use CIRCuiTS?

CIRCuiTS
Computerised Interactive Remediation of Cognition – Training for Schizophrenia

Wykes, Reeder, Bjorklund, 2010
CIRCuiTS Method

• Explain the aims of the therapy
• Try to relate it to the patient’s everyday cognitive problems
• Multiple exemplars
• Participants take credit for performance improvement
• Therapist encourages the person to use a variety of strategies
• Patient uses them overtly and then covertly
• Provide frequent breaks
• Not every task needs to be completed perfectly
• Aim - to practice skills and to use strategies, not to get everything right
Therapeutic relationship

• Collaborative working alliance
• Use lots of +reinforcement
• Empathy and masses of patience and persistence
• Focus on participant’s own solutions
• Following participant’s own goals
• Helps to be structured at first with the participant gradually taking on more responsibility.
• But….some clients find structure and direction difficult, in this case place structure around what they do well and allow a collaboration to develop.
• Try to get the person to reflect on their own performance
Training usually involves ....

- Errorless learning
  - Trying not to allow errors
  - Keeps reinforcement high and learning accurate
- Verbal monitoring
  - Overtly then covertly
- Scaffolding
  - So that tasks are always a manageable challenge
Errorless Learning and Scaffolding

- simplify tasks
- directive questioning
- manageable speed
- use sufficient information processing strategies to compensate for impairments
- reduce the amount of information
- provide adequate breaks provide help
Metacognition

• Metacognition: ‘thinking about thinking’
  – *Metacognitive skills*: the ability to reflect upon one’s own thinking
  – *Metacognitive knowledge*: knowledge about
    (i) one’s own cognitive abilities
    (ii) the sorts of cognitive abilities needed for a particular task
    (iii) knowledge about thinking in general
Improving metacognition

• **Strategy**-use integral to task completion
• **Before beginning a task**
  – Rate expected difficulty
  – Rate expected time to complete task
• **On completing the task**
  – Score given
  – Rate usefulness of strategies
  – Rate actual difficulty of the task
  – Actual time taken shown
CRT aimed at meta cognitive skills should...

KNOWLEDGE ABOUT THINKING
1. Awareness of strengths / weaknesses
2. Database of strategies

REGULATION
When and where to apply strategies

Thrive in Job
Abstract task demo

- Codes
Exercise demo

• Shopping
Clinical Issues
Training for transfer
How?

• Tailor tasks to goals
• Regularly monitor goals (i.e. keep goal-focused)
• Discuss how tasks relate to everyday life / goals
• Discuss the cognitive processes that are needed for everyday tasks
• Set homework so that CRT strategies are used in daily life
• Use real-life materials in CRT (e.g. college exercises, shopping lists, local maps)
• Agree on small set of strategies that can be used in a wide variety of everyday situations
Other important factors for successful transfer

• Internal factors (e.g. motivation, mood)

• The nature of the task (e.g. similarities with learning situation)

• The environment (e.g. free from distraction, support from other people)
Therapy Boundaries

• Therapeutic stance can foster good engagement, which can facilitate client disclosure. For example:
  – Distressing positive symptoms
  – Frustrations around medication

• Solutions:
  – Attend to client concerns and check out understanding
  – Determine how problem can relate back to CRT goals (e.g. feeling slowed down by med > goal to be more alert, symptoms > improve concentration)
  – Use supervision
Computer Skills

• Ensure that there is a table so that the client may rest their wrist on a flat surface
• Allow plenty of time to get used to point and click (click, drag, drop etc using desktop)
• Be patient!
• Reassurance that tasks are not always easy
• Typing skills not essential for CIRcuITS (but possibly allow practice using word or notepad to minimise distraction)
Navigating the Display

• Use CRT principles!

• Break down the display in a step-by-step fashion

• Helpful to do: difficulty > time > strategy
Managing User Styles (e.g. impulsivity)

- If computer skills are poor the client can direct the therapist
- Focus on simple tasks that require fewer skills and build confidence.
- Impulsive clients - slow them down by 1) engage in dialog by asking for an explanation of their actions 2) give feedback “I can’t keep up with you…” 3) humour!
Developing an Understanding of the Therapists Role

- Some clients view CIRCUiTS as mainly a “computer session” which may limit benefit
- Explain the role (coach, guide, teacher) is to help by making suggestions,
- Consider clients history of learning, experience of therapy (e.g. CBT)
- Discourage understanding of CIRCUiTS as a “test”, encourage the idea that it is a “workshop” for thinking with varied tools
CIRCuits on the Ward

• Number of tasks: ?, with different levels
• Sessions no more than 45 mins (could be a lot less depending on patient)
• Start at level 1 for every task, gradually increasing difficulty. Keep track of patients’ progress using sheet
• No set number of sessions: it depends how long it takes the person to complete all tasks
Inclusion & Exclusion Criteria

- Who is suitable to take part?
  - People with a serious mental illness
  - People you think might benefit.
- It is designed for people who are quite severely impaired, so most people can take part.
- On the other hand, they have to be motivated and possible to engage.
Adapting CRT

• Provide teaching or consultation about the role of cognitive deficits
• Deliver CRT in groups
• Get other professionals involved to provide a CRT approach across disciplines
• Use formal assessments to help understand patients’ difficulties and to help them compensate for difficulties
• Tailor treatments to accommodate cognitive difficulties
Summary

- People with schizophrenia have cognitive impairment
- Cognitive Remediation Therapy (CRT) can improve cognition and functioning with some limited benefit on symptoms
- CIRCuiTS is a new, computerised way of delivering CRT
- Now it’s your chance to use it!
- Questions & Answers