Protocol 3MDR

Treatment protocol for the preparation and administration of the 3MDR intervention

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1. OBJECTIVES OF 3MDR – THEORETICAL FRAMEWORK

3MDR is a treatment for patients who have been diagnosed with a posttraumatic stress disorder (PTSD). The abbreviation 3MDR stands for 'Multi-modular Motion-assisted Memory Desensitization and Reconsolidation'. The objective of 3MDR is to help the patient achieve a reduction of their PTSD symptoms. The key elements in achieving this improvement involve:

1) Engaging in exposure to traumatic material, whereby avoidance patterns are broken and minimized.
2) The self-initiated experience that one is capable of fully engaging in exposure to the traumatic memory.
3) Experiencing emotions in the here and now that are evoked whilst the traumatic memories are being retrieved, and giving expression to these.
4) Re-storing (reconsolidation) of the memories and any sensory and affective information associated with these.

The treatment is based on the idea that avoiding exposure to the traumatic memory and the attendant emotions makes it impossible to process the affectively charged memory; this means, in turn, that insufficient progress is being or has been made in other therapies. This fits in with what is essentially a learning theory notion of re-experiencing and avoidance: one is persistently avoidant of thinking back on the trauma reminder because doing so is accompanied by fear and distress (e.g. Foa and Rothbaum, 1998). Thus, the first objective that 3MDR intends to achieve is to break this pattern of avoidance and to encourage new learning.

One of the principles underlying the trauma-focused CBT is that repeated, long-term exposure to the trauma memory gradually removes the accompanying fear and distress. Research on the emotions associated with traumatic memories has shown that it is not only fear that is linked to traumatic memories but that several other emotions such as sadness, anger, guilt, shame and disgust are as well (Grey & Holmes, 2008). In Eye Movement Desensitization & Reprocessing (EMDR) therapy, a treatment as effective as CBT (Bisson, Roberts, Andrew, Cooper, & Lewis, 2013), it emerged that exposure to the trauma memory need not necessarily be long term. Brief exposure to the most emotional moments or 'hotspots' of the memory also suffices if combined with a distraction stimulus and the patient's own associations. 3MDR similarly endorses the principle that exposure to the most emotional moments is of the essence. The therapy creates the space in which to retrieve the memory and to express the various hitherto unprocessed emotions that are now experienced. Next, a distraction task is offered. This allows the memory to be reframed and to be stored anew. The latest insights in this field demonstrate that this happens via the process of reconsolidation (Dietrich, 2011), whereby the memory is not stored in its original form but in an altered form. The reconsolidation theory poses that a memory, while it is being recalled, becomes labile for some time, so that new information may be added to it. This happens when unexpected and/or new information (emotions/associations/etc.) is called up whilst the traumatic memory is being retrieved (the so-called 'prediction error', cf. Kindt & van Emmerik, 2016). Spatial and temporal information is subsequently added to and incorporated in the neural network of the traumatic memory (Brewin, Gregory, Lipton, & Burgess, 2010) so that the memory is given more context and is also experienced as less of a current threat. And then the 'need' for the re-experiencings is also reduced, as it were.

The 3MDR environment is such that the pattern of avoidance is broken, enabling emotional release to take place, and creating space for the integrative processing of the memories and a re-storing of the memory in a new, modified form. A number of different insights are built upon here:
- Virtual Reality: offers the possibility of enhancing 'presence' during the sessions and thus helps break the avoidance pattern (Rizzo, Reger, Gahm, Difede, & Rothbaum, 2009).
- Photos and music: Patients are asked to provide photos and two pieces of music that strongly evoke the traumatic events (also see the more detailed explanation in section 3.1). These are meant to personalize the virtual environment and offer the patients multi-sensory cues that immediately recall the traumatic memories, thereby facilitating the retrieval of the memory and minimizing avoidance (e.g. Bensimon, Amir, & Wolf, 2008; Carr et al., 2012).
- Dual task: After each confrontation with a photo, patients are asked to carry out a distraction task. This creates competition between the one task, retaining the memory, and the other task, focusing attention on the distracting stimulus. This will allow the memory to be stored in a less vivid and less emotional form (Gunter & Bodner, 2008). The dual task is also used in order to increase the sense of control over the retrieved memory and the associated emotions.
- Motion: On a treadmill, patients walk towards their self-selected photos. Underlying this are several reasons and explanations as well as mechanisms of action. First, it has been demonstrated that walking promotes the retrieval of associative memories as well as creative thinking (Oppezzo & Schwartz, 2014). Further, since motion also seems to bring about better consolidation of fear extinction, it is also used as a reinforcer in exposure therapy (Powers et al., 2015). Last, the motion towards trauma-related stimuli (photos) may contribute to a disruption of the avoidance patterns, according to theories about approach behaviour. By adopting this approach behaviour rather than the conditioned avoidance behaviour, the patient receives positive body feedback, which results in a more positive evaluation of the trauma-related stimuli and accompanying traumatic memory (Vandenbosch & De Houwer, 2011; Woud, Becker, & Rinck, 2008).

A number of traumatic memories may be dealt with during a 3MDR session. This is in notable contrast to other trauma-focused approaches, where as a rule one particular trauma memory or theme is addressed during a certain session. Experience from clinical practice has taught that some patients have difficulty keeping their focus on one specific memory, and tend to turn their thoughts to another traumatic event during exposure or EMDR. This seems especially the case with patients who have been through multiple traumatic events and have trouble selecting the core trauma, for instance because they feel they would then be disqualifying another memory as 'less serious'. The fact that more than one event can be addressed has the advantage that the patient knows that all the important events will receive attention and will therefore less easily switch from one memory to another on his/her own accord. Besides, this procedure enables the entire neural network around the traumatic events to be activated, so that a more complete mental editing of these various events can take place.

During the 3MDR the therapist will be standing next to the patient, viewing the photos together with him/her. The therapist's role is that of a supportive coach, which means that the therapist supports the patient by being at their side, encouraging and affirming the patient as s/he fully engages in the process of processing the trauma reminders during 3MDR. Each and every exposure is affirmed with a positive word choice.

2. BUILD-UP 3MDR TRAJECTORY

The 3MDR protocol is made up of 6 weekly 90-minute sessions. Within this time, there is enough scope for a preliminary discussion (20 minutes), the period on the treadmill (50 minutes, on average) and a review discussion (20 minutes). The 6 sessions are preceded by 1 or 2 preparatory session(s) (45 minutes), where patients receive information on how to choose the photos and music, a choice is made from the selected photos and music pieces, and patients are offered psychoeducation about possible reactions before, during and following the sessions. By way of closure there will be 1 to 3 integrative sessions (45 minutes), depending on the research set-up and on any arrangements made in this respect. The effect of the 3MDR and the therapeutic course are evaluated during this/these session(s). If necessary, other possible topics could include the way in which stimuli that were earlier avoided might be approached again, possibly in combination with hierarchical in vivo exposure, ways of establishing supportive social contacts, work re-integration as well as techniques to prevent relapse. The sessions' aim is to maintain a longer-term improvement of the PTSD symptoms or to discuss any necessary follow-up treatment.

3. PREPARATORY SESSIONS

The following matters must in any event be dealt with during the preparatory session(s):
- selecting photos (meaning, kinds of photos)
- selecting music (motivation choice and purpose)
- psychoeducation (general information on the protocol and elements of the 3MDR therapy for PTSD, reactions that may be expected to surface)

3.1 Selecting and bringing in photos

The therapist asks the patient to select between 10 and 20 pictures that evoke memories of the traumatic event. The criterion for the photos is, then, that they are high-affect photos, and that they are reminders of the traumatic events.

As to the selection of the photos, it is generally useful to discuss in advance for which events the patient is going to search what kind of photos. It can also be useful to set a time limit for the photo search and to come to an agreement about this with the patient.

How the search strategy then develops depends on the material a patient already has:
1) If a patient has their own photos from the time of the events, then ask the patient to search among these for pictures that come closest to the traumatic events. If so wished, the patient could bring an entire photo album to a session, but s/he does always need to make their own selection prior to the proceedings.
2) If a patient does not have any photos of his/her own, searching the Internet for pictures could be one option. In this case, it will be helpful to discuss with the patient for which events he could look for what type of picture (a picture of the landscape in which someone was shot at might be an option, for instance), so that the patient starts the search well-focused. Here, agreeing on a time limit is especially important. Other possibilities include creating pictures of positionings on Google Maps, drawing a situation (patient and therapist do this together), using pictures from art therapy or photographing memorabilia.

Obviously, a combination of 1 and 2 can also occur, where a patient's own photos are combined with Internet pictures. If any resistance to searching the Internet is felt or expected on the part of the patient, it is advisable to make a start with searching the Net during the session, in the therapist's presence (in other words, both of you sitting behind the computer). However, the patient will continue to have a leading role in the search for the photos.

The therapist subsequently goes through the selected pictures with the patient. The first aim here is to make sure that the patient chooses photos that will help him/her think back on important (read: traumatic) events and to prevent avoidance occurring at this stage. It is in this respect important that the therapist is well-informed of the content of the traumatic events*. It may, then, well happen at this stage that certain photos are dropped (not helpful, insufficient emotional charge) or are added (images of a certain event are missing). NB when it transpires during the sessions that certain images are missing or have been avoided, these can still be added.

The second aim is to gain insight into the amount of distress evoked by (the memory pertaining to) the picture. These two cannot be separated in the sense that normally the memory and the attendant emotionality/distress should immediately accompany the viewing of the picture. The photos are gone over for this purpose and arranged according to distress (SUD) score (SUD score: subjective units of distress score). For each session, 7 photos are selected which may vary per session. Choosing these photos is done on the basis of what the therapist and the patient find important now (certain themes, periods, events). Then, the photos arranged as to their SUD score are presented during the session, starting with the picture that is the least emotionally charged and finishing with the one with the highest charge. The first session is an exception, however: here one may assume that during the first couple of photos the patient is so busy getting used to the procedure that photos with a slightly lower SUD score (5-7) are very suitable as starter photos (while showing photos 1 and 2, for instance).

Prior to the session, the therapist tells the operator which photos are to be used for the session concerned and in what order. The photos are to be given to the operator on a USB stick, or sent via email, ideally a day or a few days in advance.

3.2 Selecting and bringing in music

The patient is asked to choose 2 pieces of music:

1) The first piece will be used during the warming-up walk, and aims to evoke associations related to the period in which the traumatic exposure took place. While the music plays the patient, as it were, walks back in time. The music thus needs to recall those past times: it was perhaps played a lot during the deployment or it was popular at the time of the deployment (or in the period of traumatic events).

2) The second piece of music is played during the cooling-down and helps the patient come back to the here and now. This should be a recent piece of music that has neutral or positive overtones (and one that is not associated with strong memories). The music pieces must not be overlong (4 minutes max).

There is no talking, apart from the introductory sentences, during either music piece. The music must be submitted loaded onto a USB stick since the 3MDR treatment computer does not have an Internet connection. The music should be submitted prior to the session.

3.3 Psychoeducation

Patients receiving the 3MDR treatment will, in general, have had extensive psychoeducation about their PTSD complaints. This has therefore not been included as a standard part in the 3MDR protocol. However, if this has not been done yet, it is desirable to start with this (and proceed as described in Stöfsel and Mooren, 2010, for instance).

In addition, patients receive psychoeducation about both the 3MDR treatment and the objective of this treatment. Items to be addressed include:

Explanation about the phases on the treadmill: explain the build-up of the session to the patient. Discuss the different phases. If at all possible, go to the room with the patient to show him/her what the installation looks like, and who will be sitting/standing where.
Explanation about the principle of reconsolidation: explain to the patient what the principle of reconsolidation involves and how it can improve their symptoms. The following standard text could be used here:
"In order to process the traumatic memory it is important to activate anew the memory and the emotions that are associated with that memory so as to make the memory editable and modifiable again, as it were, and it is then that the memory can be processed. What is more, while the memory is being retrieved, new information can be added to it. Right now, the memory feels as if the threat of back then is still there. By adding new information to this memory, this memory can come to feel less threatening now, in the present moment. It will feel less as if you are right in the middle of the event, with everything about to happen again at any moment. The label 'past' will be more clearly attached to the memory. This will make the memory less distressing and your PTSD symptoms will decrease."

Explanation about walking on the treadmill: the patient is told that s/he should indicate what speed they find pleasant, and that they can throughout the session say so if the speed becomes unpleasant. It is important to walk fairly briskly, but the patient can always control this. It is also important to emphasize that the patient is always free to say that s/he would like to stop.

Discussion of the reactions to the exposure to the photo: It is important that prior to the 3MDR sessions the patient is told about possible reactions that may occur whilst being exposed to the photos. These may include fear but also sadness, anger or other emotions. Expectations are that allowing oneself to feel these emotions can help in the re-storing of the memories. It is therefore important that the patient understands that a complete and full experiencing of these feelings is, in fact, an important step. Retrieving the traumatic memories and the associated emotions may involve a great deal of distress throughout the treatment period. It is important to normalize this distress. This distress is expected to decrease after the treatment, with symptoms improving.
It is occasionally found that exposure leads to dissociation. The discussion should therefore also address how much the patient actually knows about this. Dissociation may confuse a patient and it is for this reason important to explain what it involves, why it is not desirable and why it will be attempted to prevent it as much as possible from occurring during the session. In addition, any items should be discussed with the patient that may prevent dissociation during a session (for possible options, see section 5.1). It is important that therapist and patient agree on how close the therapist may (physically) come near the patient if dissociation threatens in order to bring the patient back to the present moment.

3.4 Other preparations

It may be possible to arrange for the patient to already have a look at the 3MDR equipment and to stand on the treadmill. The latter will have to be arranged beforehand with someone from the 3MDR team. The patient is advised to wear comfortable clothing and shoes to the 3MDR session and bring a towel.

4. THE 3MDR SESSION

It is important to tell the patient at the first session that the procedure may take some getting used to and, if necessary, to go through the procedure of the session again and to emphasize that s/he does not have to remember all this since you, as the therapist, are going to guide him/her through the proceedings.

Next, the operator tethers the patient in the safety harness, gives information about safety matters and asks the patient to step onto the treadmill. The operator indicates that the treadmill is about to run. It is up to the therapist to ask the patient whether the speed is all right. What you need is a normal walking pace. One tip that the therapist might give the patient is to take normal, big steps. In general, the patient will tend to walk slightly faster during the treatment. That is why during the session the therapist needs to check whether the speed is good, which he then relays to the operator. Keep a check on whether the patient does not walk too fast or tends to run: this may be a sign that the patient is avoiding. The patient is allowed to hold on to the rails.

4.1 Intro

The patient sees an aisle ahead of him/her, the music begins to play (softly):
"The music serves as a mental warm-up and will help take you back to the time of your trauma in [….]."

The music is turned up as the patient starts walking.
The music comes to an end:
"After this mental and physical warm-up, we will start with the series of pictures. You will see the landscape change and a tunnel will appear."

4.2 Start sequence

Patient approaches the first tunnel:
"You (are about to) enter the first tunnel. After this one, another tunnel will follow. The picture will appear at the end of that tunnel."

Patient walks through tunnel 1:
"As you keep walking, a picture will appear in the distance. By continuing to walk the picture will come closer and it will seem as if you can step into the picture."
Patient enters tunnel 2 and the picture appears in the distance:
"Walk towards the picture and you will see the picture come closer, as if you are stepping into the picture. Can you already make out which picture it is?"

"What do you see in the picture?" OR "Can you describe what you see?" The patient should give a literal description of the picture.

Patient gives a description of the picture. Then:
"***What memories come up as you look at the picture?" OR "What are your memories, seeing this picture now?"*** Patient briefly describes his/her memories of the picture. It is important to probe for a specific memory. Often, you will have chosen the picture in advance with the patient for a specific hotspot. Therapist asks the patient to go into the details during the 3MDR session.

Possibly: does this picture stir up any other memories?" [associative memories]
Patient may recall other memories.

"What feelings does this memory evoke in you NOW, at this moment?"
"What physical sensations does this memory evoke in you NOW, at this moment?" *or* ***"Where do you feel it in your body?"*** Here, it is important to probe ***present feelings***, at this moment (**Now feelings**). When this is uncertain or unclear, you want to check this with the patient, by asking: **"Are you experiencing that right now?"**
Therapist could probe the feelings identified or ask additional questions if patient is not very forthcoming: ***"Could you elaborate, and say a bit more about this, please?"***

Patient identifies his/her feelings. Therapist repeats every feeling (to check and so the operator can type these in). The operator types in the feelings that have been named and they appear on the screen.

When the patient has identified all feelings:

"A red ball will shortly appear on the screen that moves from left to right. On this ball there are numbers. Follow the ball with your eyes and call out the numbers on it." "But now, focus first on the memories and the feelings you've just named on the screen".

The therapist signals to the operator to start the ball**.** By doing so, the therapist can give the patient the chance to focus on the memories and associated feelings before the ball appears. The **therapist** actively encourages the patient: ***"What numbers can you see?" / "You are doing well" / "Try to call out the numbers on the ball." / "Well done, keep following the ball from left to right".***

If the patient is unable to call out 6 or more numbers, the task is extended by the operator so as to give the patient an opportunity to sufficiently let go of the memory to do the task.

When the distractor stimulus has finished:
"Very well done. As the ball and the picture fade away you can let go of the memory and the picture".

"Please rate, on a scale from 1 – 10, how much tension you are feeling right now." Therapist repeats the SUD score so that the operator can feed the SUD score into the console.

If the tension reported is high, the therapist can give the instruction to: ***"Breath in deeply and breath out" (breaths should last approximately 4 seconds in and out)***

> If there is another sequence: ***"You are now walking towards the next tunnel. The doors will open again shortly".*** Start again at **Start sequence**.

> If this is the last picture (picture 7): go on to 'Outro' (Remember to ask for the last SUD)

4.3 Outro

"Very good (keep confirming this); this was your last picture for today's session. You've done very well."

The patient sees an aisle ahead of him/her, the music starts playing (softly):
"You will now hear a piece of music that will help you to leave your thoughts and feelings there where they belong and gradually return to the present time [say the date and place]" .

The music is turned up as the patient walks.
The music stops. The treadmill slows down and is stopped (operator indicates).

4.5 After the 3MDR session

The operator helps the patient out of the harness.

A brief discussion between patient, operator and therapist in the 3MDR room follows. The therapists ask open questions: how was it / tell me more / what happened then / etc. The interaction may give an opportunity for the patient to discuss the meaning of the experience in this setting. Questions like 'what does that mean to you' are appropriate if there is a room for reflection.

If the emotional state of the patient allows it, another option is to use 'positive closing' in order to enable the patient to attach a positive meaning to the 3MDR session. The protocol for this is as follows:

"What is the most positive or valuable thing you have learnt (or experienced) about yourself in the past hour with regard to this theme (or with regard to this event)?" If necessary: "What does that say about you (as a person)? Or, "How would you describe such a person?" Possibly: "Now sit down as somebody who is… ."

"Are there any other positive things that come up for you?"

5 POINTS TO NOTE BEFORE AND DURING 3MDR

5.1 Dissociation

During the preliminary stages, dissociation will have been explained to the patient, together with a discussion of what could possibly help him/her, should this occur during the session. The following possibilities may be chosen, with these points being taken note of:

In general, it is important that the 3MDR room is cool enough and that the patient is not hungry or thirsty. In addition, the 3MDR session has various built-in interventions that can be activated on 4 levels to help the patient come closer to the present time if dissociation threatens:

- **Verbal level**: therapist will speak more loudly and clearly and help the patient come closer to the present time and place. Therapist could, for instance, say where they are, what date it is and that this is a safe environment. Questions are asked, as part of the 3MDR protocol, about feelings experienced **now** with regard to **then**. As soon as a patient threatens to dissociate, it is advisable to stress the present experience, felt now, even more.
- **Motor level**: patients walk during the entire session. This should counter dissociation. Further, patients could be asked to focus on walking, to be more aware of their feet, and, possibly, to stamp their feet. In addition, patients could squeeze a ball to further activate their arm muscles.
- **Emotional de-activation**: bringing the patient back to the present moment by focusing on the feelings experienced now. Then there is the option to focus less on the picture and thus dwell less on the past.
- **Sensory level**: it may be helpful to offer tactile stimulation (coarse flannel, a textured ball), auditory stimulation (therapist speaking up) and olfactory stimulation (smell of peppermint or citronella).

Should a patient nevertheless dissociate, and start to lose consciousness, the emergency procedure as described under 3.3 must be followed. Once the patient has been placed in a horizontal position, it is important that the therapist stay with the patient and continue to talk to the patient to help him/her regain consciousness and to bring him/her back to reality.

5.2 Temperature

The 3MDR room is equipped with air-conditioning and a thermometer. Temperatures in the room may rise considerably due to the equipment used there. Since the patient exerts himself physically and mentally, it is important to keep a watchful eye on proceedings and to stop the session if temperatures soar. The operator monitors temperatures, but it is up to the therapist to assess the situation and decide whether or not to cease the session.

5.3 Emergency procedure

In the event of a patient feeling unwell or becoming aggressive, an emergency procedure specific to the treatment center must be followed. Example of the protocol (also see next page) is the RAP555 procedure. The operator is to immediately bring the treadmill to a standstill by pressing the red stop button. The therapist must (simultaneously) press and hold the alarm button, to call several colleagues (including at least one person from the in-house emergency response team [BHV]) to the 3MDR room to lend assistance. The operator must disconnect the patient and, if at all possible, remove the harness straightaway. If the patient is not conscious, he/she should be placed on the treadmill. If necessary, the therapist phones the emergency number to alert the duty psychiatrist.

Emergency procedure **RAP555**

In the event of the client feeling unwell /becoming aggressive, this procedure must be followed:

Red stop button: press [operator] → treadmill will stop immediately.

Alarm button: press 2x [therapist] → this will bring several colleagues (incl. 1 person from the Emergency Response team [BHV]) to the 3MDR room.

Patient: disconnect [operator, therapist lends support]

→ patient can be placed on the treadmill (recovery position) or can sit down.

555: phone [therapist] → this will bring a psychiatrist to the 3MDR room.

Follow-up action

- Assessment by the psychiatrist whether the patient can go home or may need to go to casualty (in the event of a patient being unwell).

- Incident must be reported to Marieke van Gelderen (0640391636).

- Incident must be reported to the Senior Medical Officer (06-53796904).

- Therapist prepares a Patient Care Incident Report [MIPA].

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