Dementia is an isolating experience that can prevent those with the condition from sharing the same reality as others in their surroundings. They may forget what they have just done, where they are, and what is likely to happen next. This disorientation and confusion may lead carers to dismiss the importance of the thinking of people with dementia and the relevance of their communication (James, 2011).

A systematic review has revealed major deficits in health professionals’ confidence and competence in communicating with people with dementia, particularly in hospital acute and general medical services (Eggenberger et al, 2013).

However, with careful attention to their speech, our ability to empathise and communicate can improve greatly (Eggenberger et al, 2013). By listening to the narratives of people with dementia closely it becomes evident that many of their perceptions are not random or unstructured thoughts, but are wholly consistent with their own history. For example, a patient may accurately provide what appears to be the wrong address, but is accurate for a house she lived in 25 years ago, or former miner may believe he still works in a mine that closed in the 1980s.

The longer people have dementia, the further back some of their outdated beliefs will be drawn from. To understand why they access memories from progressively earlier stages in their lives as their dementia progresses, the nature of memory can be analysed using the analogy of the "time machine".

Understanding memory in dementia
The time machine analogy demonstrates how memory deteriorates in dementia. Once learnt, it enables carers to understand what is happening and find ways to develop interventions to support people with dementia. The principles underpinning the analogy are outlined below.

The timeline concept
When people look back on their lives in sequence from the earliest times to the present day, this is referred to as a timeline. Every individual’s timeline is unique, involving significant events that have happened in their life.

Key events
Most people’s earliest memories begin around three to five years of age, after which they can recall key events. The events that are easiest to recall tend to be associated with high emotional content.

How a time machine concept aids dementia care

In this article...
- How memory is lost in dementia
- Applying the “time machine” concept
- When therapeutic lying should be used

5 key points
1. People with dementia may be unable to store memories of recent events, yet retain memories from longer ago.
2. As memory loss progresses, people with dementia may “travel back in time” to an earlier stage of their lives.
3. Remembering past memories may reactivate distress about abuse or bereavement.
4. Worsening memory and lessening insight into memory problems can lead to conflict.
5. Therapeutic lying may be useful but involves ethical problems.

People with dementia may reactivate distressing memories from the past.
BOX 1. CARE OF MR GREEN

Tom Green, who is 82, moved into a care home following the death of his wife and a diagnosis of dementia. Table 1 shows his timeline, depicting key events in his life, and emerging beliefs and actions resulting from memory loss.

As his dementia progressed, Mr Green lost the ability to encode and store material and his recall gradient disappeared. He was still able to recall significant features of his life, but started to consider these as features of his current reality. As his memory declined further, he started reliving his past, and the retrieved thoughts and beliefs were no longer treated as memories.

Mr Green became very fixed on the belief that his wife was still alive. He constantly asked for her and would not accept that he had attended her funeral. Indeed, the more people who told him about her death, the more suspicious he became of their motives. For example, he would ask staff whether she had left him, or was having an affair, or was ill. Initially his behaviour was perceived to be a feature of a psychotic paranoia, and he was treated with an antipsychotic drug, but the involvement of a therapist led to his memory difficulties being recognised and the antipsychotic withdrawn.

Loss of memory efficiency
For people who do not have dementia, memory is a relatively automatic process. The correct word, the right name, and so on, can be recalled with relative ease. This process is less efficient with age and can be severely disrupted for people with dementia.

Loss of the recall gradient
People who do not have memory problems typically display a “recall gradient”, whereby recent events are recalled better than older ones. Exceptions to this are significant emotional events, as discussed above, which are easily retrieved. The recall gradient is often lost in people with dementia because recent events become increasingly difficult to recall. However, significant memories from the distant past can be recalled well.

Loss of ability to store memories
When people begin to experience problems with their memory, retrieval of memories can be aided via the use of cues and reminders; reminiscence therapy relies on this method. However, for cueing to work appropriately, there is an assumption that the memories are stored and can be assessed. In addition to experiencing retrieval problems, people with advanced dementia may also be unable to encode and store memories. The latter accounts for the loss of the recall gradient.

Time-shift process: “last in, first out”
An inability to make new memories can often precipitate a “time-shift”, as people slowly begin to mix up previous events with present ones. Gradually they lose the ability to retrieve recently stored events, and their current reality will start to be confused with earlier memories.

Therefore, slowly their perception of reality will shift back in time - they may first forget that they have moved into care, then that their spouse died, then their diagnosis of dementia, and later on the fact they are retired. This time-shift process is referred to as “last in, first out”.

Loss of ability to store memories

TABLE 1. MR GREEN’S TIMELINE

<table>
<thead>
<tr>
<th>Key events in Mr Green’s life</th>
<th>Emerging beliefs and problematic actions resulting from progressive memory loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory problems become severe</td>
<td>- Starts to forget things on a regular basis and no longer remembers events, even when provided with good cues. Forgets family have visited him. Begins to believe people are trying to deceive him and this may make him suspicious and/or angry.</td>
</tr>
<tr>
<td>Moves into care</td>
<td>- Forgets he has moved into a care home. Believes he needs to go back to his own home. As a result he constantly asks to leave the care home</td>
</tr>
<tr>
<td>Wife dies</td>
<td>- Forgets his wife has died. Believes she is waiting at home, has abandoned him or is having an affair. Frequently asks for her, searches for her, or wants to leave facility to find her</td>
</tr>
<tr>
<td>Diagnosed with dementia</td>
<td>- Forgets he has any problems with memory. Loses insight into his illness and believes there is nothing wrong with him. Starts to insist and argue that his view is correct</td>
</tr>
<tr>
<td>Retires from work</td>
<td>- Forgets he retired 10 years ago. Believes he still works early shifts. Tries to leave the care home early each morning and becomes angry when prevented from doing so</td>
</tr>
<tr>
<td>Death of parent</td>
<td>- Unable to recall his parents have died. Constantly asks for mother, claims she is at home or that he saw her yesterday</td>
</tr>
<tr>
<td>Forgets that he has grandchildren</td>
<td>- Becomes a grandparent. The family resemblances and age of the grandparents makes him misidentify them as his own children</td>
</tr>
<tr>
<td>Birth of children, getting married</td>
<td>- Forgets that his children have grown up. Fails to recognise them as his sons and daughters. Due to family resemblance, calls his daughter his wife and his son his dad</td>
</tr>
<tr>
<td>First girlfriend, favourite teacher, first day at school</td>
<td>- Owing to the long-standing nature of the remaining memories, these events often tend to be retained. Exact details may be sketchy but some early memories will be remembered in remarkable detail, such as songs, names of school friends, poems and family stories</td>
</tr>
</tbody>
</table>

Intervention taking account of Mr Green’s beliefs
The case study in Box 1 outlines the care of Mr Green who has dementia. The insight provided the insight provided by the use of the time machine analogy led to the development of a cognitive behavioural therapy formulation, taking account of his thoughts and beliefs. It was determined that his view of reality was not consistent with the present, and a strategy was needed to deal with this time-shifted reality. In an attempt to reduce anxiety and emerging suspicious ideation, we initially attempted some reality orientation strategies, cueing him to the present through the use of conversations, photographs and other memory techniques.

Fig 1, overleaf, shows a conceptual model outlining Mr Green’s and his carer’s interlocking spheres of communication. Mr Green’s distressing thoughts about his wife are making him anxious and initiating questioning and searching behaviour. In this particular scenario, his carer responds with the truth in an attempt to re-orientate Mr Green to the current reality. However, this approach often fails with people who have moderate to severe dementia; indeed, the truth is often met
with hostility because they perceive that they are being lied to.

Our next strategy was to attempt to shift Mr Green’s focus via distraction techniques. We used behavioural charts to identify those periods of the day that he tended to become focused on his wife, and just before these periods we would take him for a walk or engage him in a group activity (art group or sports reminiscence).

However, if these techniques failed, we were left with a last resort, known as therapeutic lying (Day et al, 2011; Tuckett, 2011; Elvish et al, 2010; James et al, 2006).

Therapeutic lying involves using person-centred untruths, following a set of published guidelines, which are developed to reduce the person with dementia’s distress (Culley et al, 2013). These untruths are formulation-led and care-planned, and wholly consistent with the person’s past. In Mr Green’s case, he was told that his wife had gone to visit his sister in London. We adopted this strategy after speaking to his daughter, who said that her mother would frequently go for periods of up to two weeks. She told us: “Mum would go to the theatre, museums. Dad liked her to go because he knew how much she enjoyed these London breaks.”

Strategies to address Mr Green’s reality

The time machine analogy helped us to identify where Mr Green was situated in his timeline. Now that we were aware of this, we were able to conceptualise strategies that were consistent with his reality rather than trying to force him to reorient himself to ours.

One author of this article (Mackenzie) has produced a DVD of case examples, similar to Mr Green’s situation. The DVD, entitled The Time Machine (Mackenzie, 2013), has been used in a series of empirical studies and as a guide to the treatment of challenging behaviour. It also contains examples of the appropriate use of therapeutic lying.

Notwithstanding potential benefits associated with therapeutic lying, it is important to recognise that the technique involves numerous ethical problems. These problems include perceived treachery (Kitwood, 1997), manipulation and damage to autonomy (Müller-Hergl, 2007), and untrustworthy practices (General Medical Council, 2013).

The Mental Health Foundation has published a review identifying key issues around lying to people living with more severe dementia (MHF, 2014); an expert panel has been appointed to examine the evidence and learn from the experiences of families, care workers and professionals.

Teaching the time machine analogy

The time machine analogy can be taught to care staff working in residential homes, and may be useful for nurses and professionals working in a wide range of hospital and clinical settings.

During training, groups of carers think of a resident in their care and produce a likely timeline, starting at the bottom with the resident’s earliest likely memory and finishing at the top with the resident’s current situation, as in Mr Green’s example (Table 1).

The completed timeline represents the typical phases of a person’s life, plotting the course through relationships, employment, significant events and finally illness or death of spouse and a move into care. The trainer highlights that many of these memories or important events on the timeline are associated with high levels of emotion (anxiety, joy, anger and guilt). It is also noted that it is often those highly emotive memories that are most readily recalled. Participants are then asked to imagine that their residents are beginning to have some memory problems and beginning to forget their most recent memories, such as why they have come to live in care, that they have dementia or that their spouse is very ill.

**BOX 2. EMERGING MEMORY PROBLEMS**

With emerging memory problems, Mr Green might say: “Where is my wife. I haven’t seen her for some time.”

However, in this situation Mr Green accepts that he is forgetful and can be cued into the truth.

**Mr Green:** “Can I go home? I haven’t seen my wife all day.”

**Carer:** “Tom, don’t you remember your wife had been ill for while? You looked after her really well. But sadly she died six months ago. After she died you agreed to stay with us.”

**Mr Green:** “Oh, of course. I forgot for a moment.”
they are correct and others are trying to ties can begin to lead to conflict as people lessen, and carers may no longer be able to insight about their memory problems tion to the worsening memory, people’s things because they know their memory is accepts that they have forgotten memory loss will be aware of the problem, carers and health professionals to understand the logic of the individual’s initially people with early stages of memory loss will be aware of the problem, and may get frustrated about it, but will accept that they have forgotten things because they know their memory is getting poorer. Typically at this stage, they can be cut into remembering where they are or what has happened to loved ones (Box 1).

Over time things get worse, and in addition to the worsening memory, people’s insight about their memory problems lessen, and carers may no longer be able to cue them into remembering important memories. This combination of difficulties can begin to lead to conflict as people with dementia become convinced that they are correct and others are trying to fool them (Box 2).

The trainer draws a line through the relevant memories on the diagram to represent that these memories are no longer available to the individual. In relation to Mr Green, he can no longer remember that he has severe memory problems, that he lives in care or that his wife has died.

Forgetting does not occur randomly, in general the process is: “last in, first out” (with the most recent memories forgotten first). Forgetting occurs over a time gradient, with early memories often being well preserved (Box 3). When people with dementia become very “time-shifted”, they will use outdated memories as their main source of information about themselves.

Making sense of presenting behaviour

The timeline clearly demonstrates how memories from their past become the present reality for people with dementia, who are often convinced that their version of events is correct. The impact of not being believed by others can result in paranoid ideas, depression, anxiety and challenging behaviour. As they move back- wards in their own history, they may also start remembering emotional memories from the past, which may reactivate old distress that was not completely resolved at the time (such as bereavement or abuse-related distress). As a result, they may become locked into a loop of repeated fear or anxiety.

Devising the timeline allows a carer or group of staff to look at the presenting behaviour and try to make sense of it in terms of individuals’ life story. This facili- tates the selection of the most appropriate therapeutic intervention for that problem, at that particular stage of the illness. As the illness develops and they progress through the timeline, alternative strategies can be put in place.

Making sense of people’s difficulties

Awareness of the nature of memory in Alzheimer’s and other dementias means carers and health professionals are better able to make sense of the difficulties being experienced by people with dementia, and to appreciate that they are not just “confused” but rather that their memory is declining in a very structured and predictable way (James, 2011). It also enables carers and health professionals to grasp the nature of any disorientation and understand the logic of the individual’s beliefs and current thinking. It is hoped that an appreciation of the latter will enable carers and health professionals to better empathise with the situation of people with dementia, and respond accordingly. These responses may, or may not, involve the use of a therapeutic lie, depending on the individual’s specific needs.

Health professionals, whether in hospital settings or care homes, often do not receive dedicated training on how to communicate with people with dementia. It is important to develop communication and interactions skills with this patient group as they occupy many of wards, both in older adult mental health and in general medical settings.

An understanding of the beliefs and perceptions of people with dementia will allow health professionals to better meet their needs, and refrain from using inap- propriate medications and psychological interventions. The time machine analogy is a useful way to conceptualise memory difficulties in dementia, and can provide a conceptual framework for communicating with patients effectively. Therapeutic lies, used as a last resort, may be useful interventions based on the time machine approach. N T

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