This document represents the Production Manual of the STUDICODE online dementia course (Intellectual Output „Production Manual").

This document is also available on the project website under the section „results" (https://www.studicode.med.tum.de/en/results).

**Chapters**

# Aim of the production manual

Goal of the STUDICODE project is to improve the digital competence among lecturers in regards to providing modern remote teaching formats in the medical field. In STUDICODE, lecturers from four partner institutions joined forces to develop an interactive online course about dementia for their students. By creating this course, lecturers advanced their skills and competence regarding modern teaching formats (learning by doing). More information on the lecturers learning success on developing educational media formats is provided through the STUDICODE "Evaluation Kit for Educators".

The STUDICODE online course on dementia is a complement to existing lectures at the partner sites. Thus, this Production Manual outlines the steps how the consortium developed the STUDICODE course. It also summarises the STUDICODE best practices and experiences in creating interactive media formats.

By sharing this information, the STUDICODE consortium tries to contribute to the dialogue on modern teaching formats and motivate lecturers from other disciplines to try out interactive media formats in online teaching. Moreover, Furthermore, this document may serve as a blueprint for re-creating a similar course in other countries and facilitate an uptake of STUDICODEs "lessons learned".

The approach for developing the STUDICODE online course as well as the selected media formats were based on several consultations:
- four learning-teaching-training events with keynotes by experts in didactics
- feedback from stakeholders at the first STUDICODE multiplier event

## Preliminary considerations and course planning

Before creating the course, the consortium reviewed its concept of the STUDICODE course. A clearly outlined aim for the course was considered as very important. This review process and

subsequent discussions lead to a shared vision of the course. The discussions included the following aspects:

| What is the duration of the course? | 90 minutes |
| --- | --- |
| What is the overall theme of the course? | Quality of life for people with dementia, Holistic approach to dementia treatment and care |
| What should students learn? | Person-centred perspective on dementia |
| Will students need prior knowledge on dementia to take the course? | Joining the medical lecture on dementia is necessary before taking the STUDICODE course |
| How will students receive feedback on their learning success? | Downloadable certificate after a multiple choice test at the end of the course |
| When should the course launch? | Winter semester 2022/2023 |
| Which learning management system is available a the partner sites? | Moodle |
| Which software, tools and programmes are available to the lecturers? | Video camera, editing software, Powtoon licence, H5P in Moodle, MS PowerPoint |
| How can the educational materials be shared with interested parties? | Creative Commons BY-SA (share alike) 4.0 International |

*Key questions to be discussed before creating the course*


As the STUDICODE course is developed in a joint effort by four partners, a common basis in several issues was seen as vital by the consortium. These issues were specifically targeting the topics below.

| In which languages will the course be produced? | English as a master version, translations to languages at the partner sites shortly after completing the EN version |
| --- | --- |
| Which language style will be used? | Non-medical language, avoidance of discriminatory terms ("patients", "demented persons", "sufferers" etc.) |
| How can a group of lecturers develop educational material together for a joint course? | Set-up of an editorial board (online meetings twice per month to oversee the content creation and harmonise content in regards to editing styles, colour schemes, language, mix of media formats) |

*Key questions to be discussed before creating a joint course with multiple content creators*

# Timeline

The STUDICODE course is developed in a joint effort by partners at four sites. The course development included several steps which are displayed in the table below.
*Timeline of steps for developing the STUDICODE course*

| | |
|---|---|
| **First meeting**<br>• Learning Managements Systems and available tools at partner sites<br>• Course outline | November - December 2021 |
| **Second & Third Meeting**<br>• Core themes and local additions<br>• Sequence of chapters<br>• Level of detail per chapter<br>• Media formats | January 2022 |
| **Fourth Meeting**<br>• Joint workshop on sample chapter | February 2022 |
| **Content creation**<br>• Set-up of editorial board meetings | February - June 2022 |
| **Translation**<br>• Translation of content into local languages<br>• Implementation of materials on online learning management systems | June - July 2022 |
| **Course promotion**<br>• Registering the course in the local study programmes<br>• Promoting the course at lectures | July 2022 |
| **Quality review**<br>• Testing for technical errors (e.g. in games)<br>• Carefully checking content and language by the entire consortium | July - September 2022 |
| **Launch**<br>• Enrolment of students<br>• Answering initial questions on the course | October 2022 |
| **Course management**<br>• Monitoring enrolment of students<br>• Answering questions in a live Q&A session (January 2023) | November 2022 - February 2023 |
| **Course evaluation and improvement**<br>• Assessing the students' evaluation sheets<br>• Planning for course improvements based on feedback | February 2023 –project's end |

## Production of individual media formats

The STUDICODE course makes use of a mix of interactive and non-interactive media formats. The goal of this didactic approach is outlined in the Output "Didactic Concept".
This section of the Production Manual provides information on how the STUDICODE consortium created the individual media formats. Also, lessons learned are provided in order to share experiences.

**Texts**

Texts are used in the STUDICODE project to provide important information to the students. However, texts need to be kept short and concise. Wherever possible, texts are broken up into paragraphs or by using bullet points. Also, texts can be structured in multiple sections using an expandable "accordion" in Moodle (see example below).

> **˅ Detection of dementia in the hospital**
>
> Only in half of the people with dementia in a general hospital dementia has been diagnosed prior to admission. Since there is no systematic cognitive screening, and hospital staff is usually not equipped to identify cognitive impairment, dementia often goes unrecognised.
>
> The suspicion of dementia may only arise when people do not comply with the structures and procedures of a hospital or exhibit significant behavioural symptoms. For example, they may not find their way in the complex and unfamiliar environment, do not retain information, refuse medical interventions, show night-time restlessness or wandering, or develop delirium.
>
> However, even if dementia is known at the time of admission, most hospitals are not able to meet the need of persons with dementia in terms of information, orientation, communication and support.
>
> **˃ Treatment and care for persons with dementia in the hospital**

Texts should be written in a direct and concise manner. Sentences should not start by mentioning an exception or the opposite. Rather, the most important things should be mentioned first. Nested sentences and interjections should also be avoided.
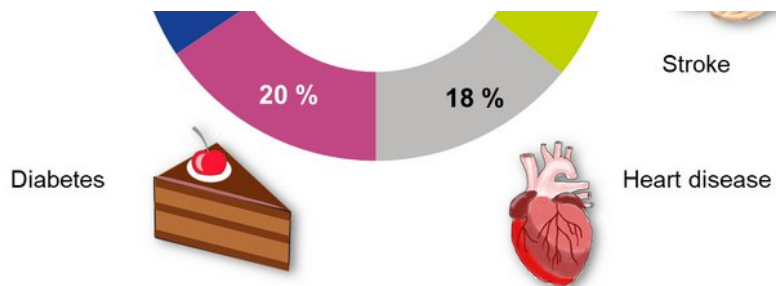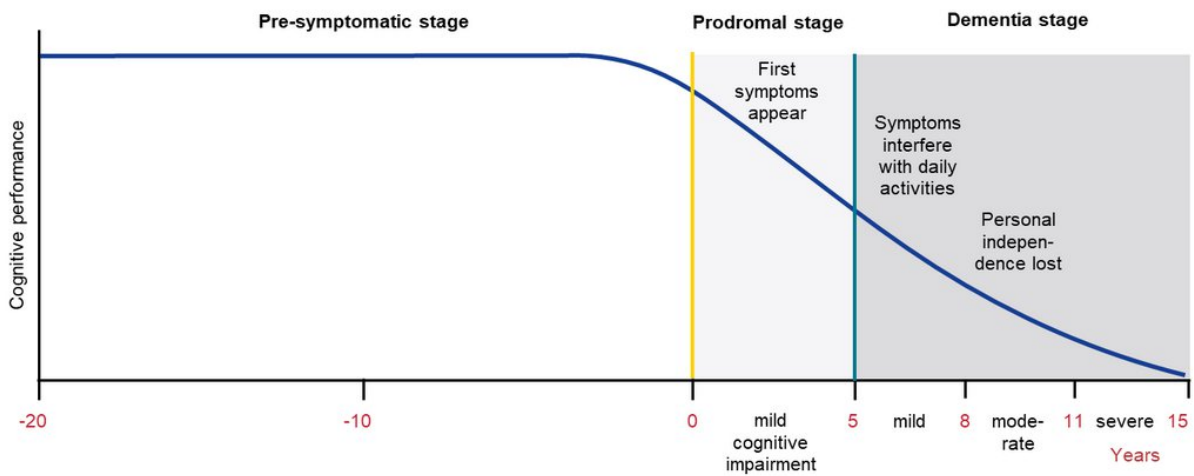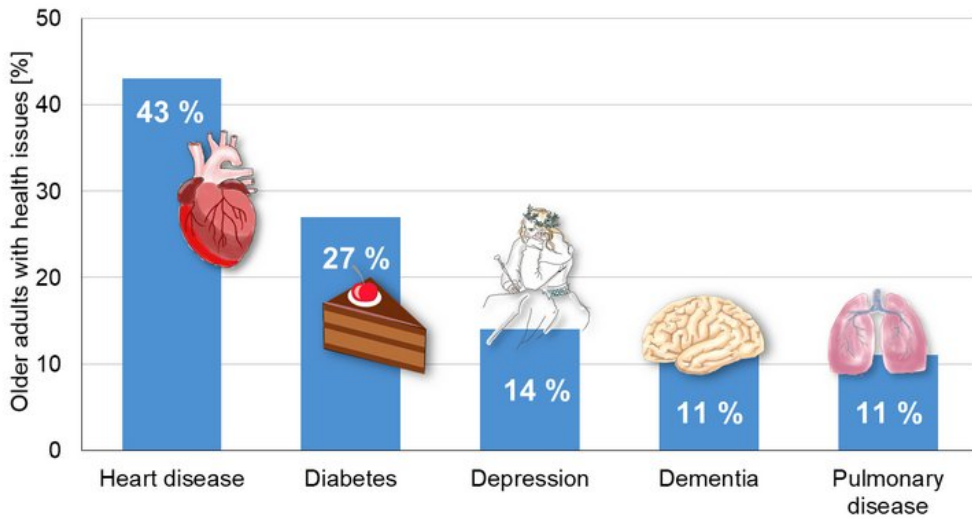
**Illustrations**

Illustrations are used in the STUDICODE course for providing visual orientation, to highlight key information, and to liven up the text. In order to keep illustrations uniform, a specific colour pallet was chosen for the illustrations:

For highlighting information in illustrations, these colours were used:

Examples are shown below:

Also, the "reminder" sections at the beginning of each chapter are always highlighted with this icon:

The summaries at the end of each chapter are all marked with this icon to provide visual orientation in each chapter:
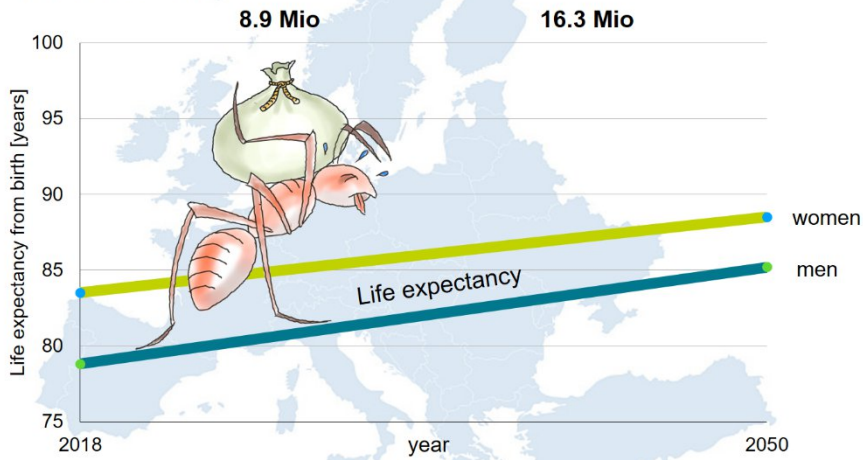
**Infographics and animated infographics**
Infographics are a common way of combining different kinds of data in one graphical representation. The STUDICODE consortium identified the following approach as the most convenient for creating animated infographics:
1. Make a plan of what the infographic should show
2. Research the data to be provided in the infographic
3. Translate verbal information into a visual message (e.g. by generating symbols for the items featured in the infographic)
4. Create a chart (e.g. bar chart or line graph in MS PowerPoint / Excel or KeyNote)
5. Add a meaningful background to the chart (e.g. a royalty-free map)
6. Add symbols to the chart
7. Add labels and headlines à this file can be exported as a jpg or png file
    For creating an animated inforgraphic, two additional steps are necessary:
8. Animate the infographic by using the "animation" tool in the programme
9. Export the animated infographic as a video (mp4) or gif file

People living with dementia in Europe

8.9 Mio          16.3 Mio

Life expectancy

women

men

*Ant moves from the left to the right while the bag of cloth becomes larger.*



People living with dementia in Europe

8.9 Mio

Life expectan
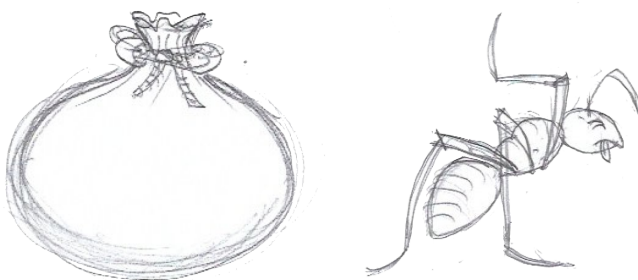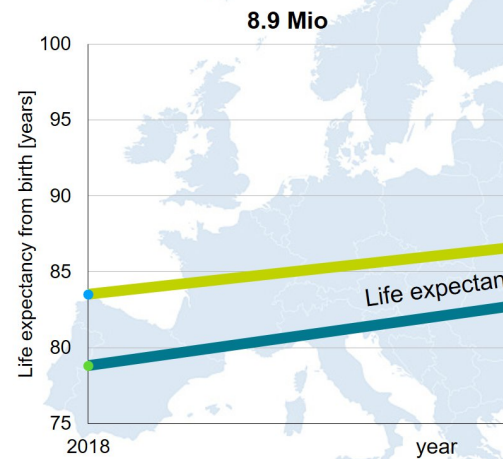


*Ant and bag were sketched on paper, a scanned version was imported and coloured.*

## Advantages

Animated infographics are easy to create using common software. The STUDICODE consortium considered the time required for developing this media format as appropriate. This format allows students to retrieve information easily and the graphical representation makes it easier for students to remember certain elements of the infographic. The animation draws the attention of students to certain parts of the illustration.

## Challenges and lessons learned

Although this media format offers many educational advantages, the STUDICODE group found it initially difficult to come up with ideas for graphical representations. However, this challenge was overcome with growing experience with this media format.

**Interviews**

In the STUDICODE course, interviews are an eye-catching format for providing expert knowledge or individual case examples to students. The STUDICODE followed the following approach for creating interview-style videos:

1. Identify the interviewee, provide them with a script in advance and have them sign an agreement on the terms of usage for the video material
2. Choose a location for conducting the interview where good lighting (bright, from several angles) and sound quality (no background noise, no echo) can be ensured
3. Test the camera and microphone (preferably Lavalier) beforehand
4. Rehearse the interview before recording
5. Edit the video (e.g. Camtasia, Windows Movie Maker, Windows Video App, iMovie)
6. Add subtitles if necessary or provide a downloadable script below the video
7. Display the key messages or fade in the key words
8. Export the video in an appropriate resolution as an mp4 file

If available, use a teleprompter where you upload the final script. The reading speed should not be too fast. Ask the Interviewee to accompany their talk by some gesturing (not too much, not monotonous) and not remain completely immobile.

**Advantages**

Interviews have shown to be a valuable format which is well accepted by students. In the experience of the STUDICODE course, such videos should not be too long (approx. 2-4 minutes). Extensive narrative passages should be avoided. The message of the interviewee should be stated clearly at the beginning or end of the video.

**Challenges and lessons learned**

Parts of the STUDICODE group found it difficult to instruct interviewees appropriately. Keeping the videos short was a challenge for the STUDICODE team. As a way to cope with this, identifying one clear message for each video prior to recording the video was seen as helpful.

**Animated cartoon videos**

Animated videos represent a way of showcasing case examples in the STUDICODE course. Instead of featuring real patients, a cartoon-style video allows to illustrate the life of a fictive person with dementia. For creating these cartoon videos, STUDICODE has selected the tool "Powtoon". The following steps were taken for developing these videos:

1. Sketch a storyboard of the video (e.g. on paper or with Powerpoint/Keynote)
2. Select appropriate styles (figures, props) in Powtoon
3. Allocate the figures and props on the video timeline
4. Add subtitles or downloadable script below the video
5. Add background music (public domain) or voice over
6. Fade in the key words if appropriate
7. Export the video in high resolution as an mp4 file

The videos used for the STUDICODE course were planned to have a length up to three minutes in order to keep information concise.

**Advantages**

Cartoon-style videos are a useful tool for illustrating case examples in the STUDICODE course. Powtoon has many functions, build-in tools and a large resource of materials (drawings, music, backgrounds etc.).

**Challenges and lessons learned**

The STUDICODE group found the variety of options challenging to oversee in the beginning. Once the group decided on a common style for the STUDICODE Powtoon videos, creating them became much easier. In addition, keeping these videos short and concise (2-3 minutes) can be difficult due to the large variety of options in Powtoon. Furthermore, saving the draft was time consuming and the loading time on the Powtoon website was perceived as very long.

**Virtual flashcards**

Virtual flashcards are a practical tool for students to check their knowledge on a specific topic or get more information on a certain topic. The STUDICODE team agreed to use H5Ps "dialog cards" for this media format. These virtual cards feature text (and an optional picture) on the front of a card. The student can turn the card and read more text on the back side of the card.



*exemplary card*
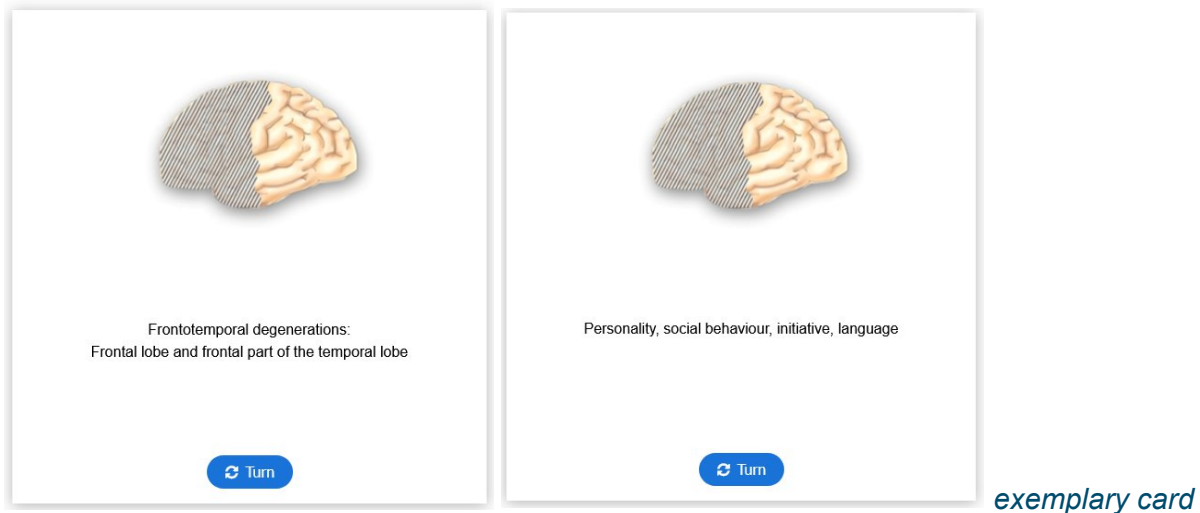
H5P is an open-source tool for creating interactive materials. The cards can either be created directly on the H5P website or via Moodle. The cards can also be shared as ".h5p" files or embedded via a link.

For creating these cards, the STUDICODE group recommends these steps:

1. Sketch the front and back side of each card
2. Prepare an illustration (jpg or png file) if appropriate (illustration will be displayed on both sides of the card)
3. Add a headline to the first card in H5P
4. Add the text for both sides and the optional illustration
5. Create additional cards if necessary

**Advantages**

The virtual flash cards are easy to create with H5P and can be inserted in Moodle without any issues. Furthermore, students get to explore the information actively.
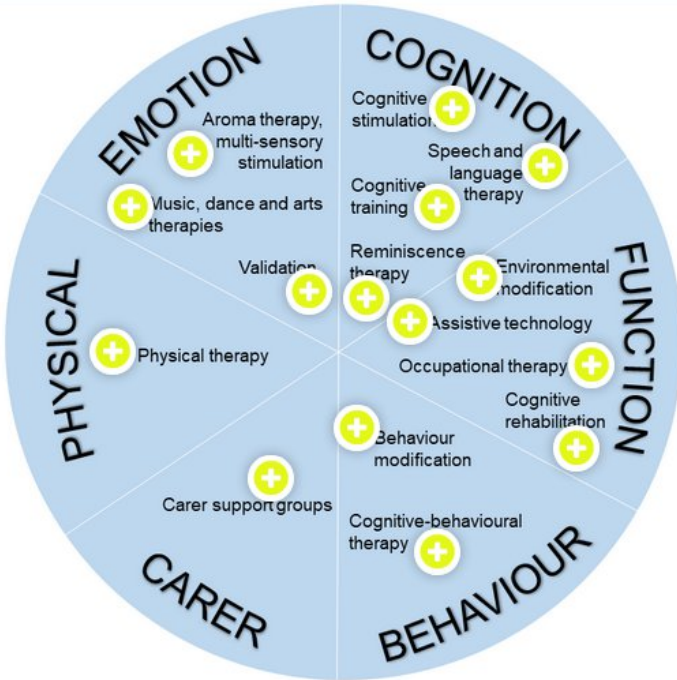
**Challenges and lessons learned**

The STUDICODE group overserved no challenges with this media format.

**Digital Hotspots**

Similarly to the cards, hotspots were also realised using H5P for the STUDICODE course. Hotspots highlight a pre-defined part of an illustration. When students click on this hotspot, a light box pops up where additional information can be provided as text or with additional illustrations or video material. The digital hotspots can be shared as ".h5p" files or embedded via a link.

For creating these hotspots, the STUDICODE group suggests the following steps:

1. Choose a background image (e.g. chart or map)
2. Upload the image as jpg or png file to H5P and add a title
3. Select the colour and icon for the hotspot(s)
4. Add the first hotspot by defining the location on the background image in H5P
5. Add the text (or illustration or video) to be displayed in the light box
6. Add additional hotspots if necessary

*Exemplary hotspots*

**Advantages**

Digital hotspots represent a valuable way of providing information on multiple layers. Depending on the students' interest, they can specifically click on hotspots that they find interesting and want to learn more about. Also, the STUDICODE consortium found the amount of time required for setting up these hotspots to be appropriate.

**Challenges and lessons learned**

No major issues occurred when using hotspots for STUDICODE.

**Drag-and-drop games**

Drag-and-drop games are an interactive way to engage students with a topic. In STUDICODE, these games are made using H5P. These games consist of a set of droppable items which have to be placed on the correct spot on a background. The drag-and-drop games can be shared as ".h5p" files or embedded via a link.

For creating drag-and-drop games, the STUDICODE group proposes these steps:

1. Choose a background image (e.g. chart or map)
2. Upload the image as jpg or png file to H5P and add a title
3. Define the drop zones (= the areas on the background where students can place elements)
4. Define the droppable items (= the items that students can place on the background)
5. Define the correct matches (= the correct placement of each droppable item on its drop zone)
6. Define feedback for the students according to their score (score range depends on the number of correct placements by the student)





*Exemplary drag-and-drop game*

*Exemplary game with several steps*

« Back     Proceed »

Mr Toni Kovać comes to your primary care practice. He is a 63 year old chief executive in a large industrial company. Toni Kovać is married to Marija and has two nearly grown up sons. You have been treating Toni since a few years with the ACE inhibitor Ramipril for arterial hypertension. You know him as an accurate and conscientious person.
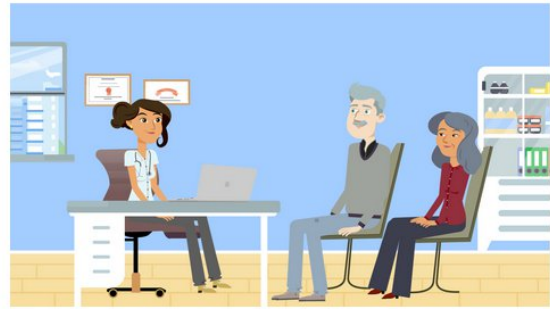
Please click on the small arrow button on the bottom right to receive more information about Toni. Then, please continue the scenario by clicking on the button "proceed" on the upper right.

1 / 2 ▸

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What is your suspected diagnosis?
(Step 1 of 15)

| Hypertensive crisis | → |

| Side effects of the antihypertensive drug | → |

| Depressive episode of moderate severity | → |

« Back

1 / 2 ▸

How to diagnose dementia?
Suspected diagnosis: Hypertensive crisis

« Back     Proceed »

You take the blood pressure. The result is 145/94.

This is a bit too high, but may be ok when someone feels tense. A hypertensive crisis is unlikely.

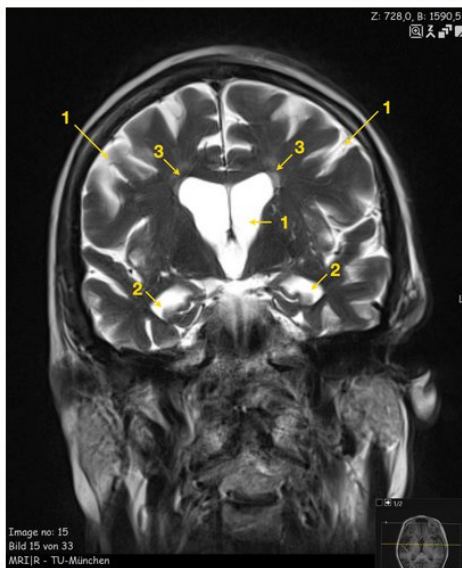Back to your suspected diagnosis - which alternatives do you consider?
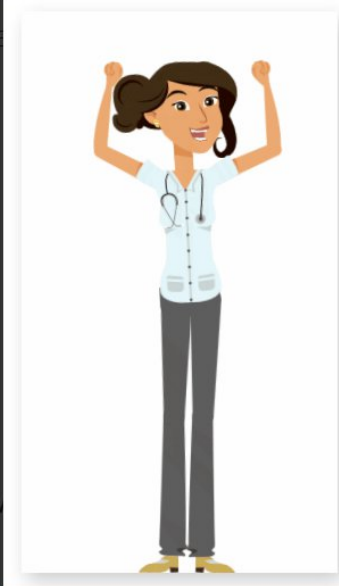


1 / 1

The MRI scan shows generalised brain atrophy (1), atrophy of the medial temporal lobe including the hippocampus (2) and minor signs of microangiopathic changes around the ventricles as consequences of the patient's arterial hypertension (3). The image is consistent with your suspicion of incipient Alzheimer's disease.

◀ 2 / 2

How to diagnose dementia?
You hit the bullseye!

« Back     Proceed »

Your diagnosis is correct!

You invite Toni Kovać to come to your office again for disclosing the diagnosis and discussing therapeutic options. If he agrees his wife could come with him. At the next visit you explain the diagnosis, carefully choosing your words, and outline the possibilities for treatment.

Proceed »

1 / 1

**Advantages**

The drag-and-drop games are an interactive tool for students. Students can use their knowledge for solving the game and learn about a certain topic at the same time. Regarding the level of difficulty, the task may be difficult for most students to not solve the game on their first try. Students are encouraged to make several attempts to get closer to the correct solution.

**Challenges and lessons learned**

The STUDICODE group acknowledges that creating this media format requires more time compared to the virtual flashcards or digital hotspots. However, this is compensated by the learning benefits for the students.

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# Lessons learned

During the development of the STUDICODE course, the consortium has enlarged their competence in regards to modern didactic concepts and novel teaching formats. In order to share lessons learned by the STUDICODE group, a summary of the most important learnings is provided below.

*Create a vision of the course outline*
- ✓ Agree on the learning objectives of the course
- ✓ Decide on the duration of the course
- ✓ Review the context in which the course will be used (e.g. add-on course, part of a blended-learning class, complement to lecture)
- ✓ Agree on a timeline for the course development
- ✓ Select appropriate topics and gather them into chapters (and subchapters)

*Check available resources and timelines*
- ✓ Review the software, tools and programmes available to lecturers involved
- ✓ Discuss the competence of the lecturers on using these tools

*Select appropriate media formats*

- ✓ Evaluate different media formats
- ✓ Discuss the advantages and disadvantages of different media formats and select the most appropriate ones
- ✓ Create and discuss a sample chapter that includes a mix of media formats

*Monitor the progress of content production*

- ✓ Meet regularly in an editorial board to oversee the content production
- ✓ Harmonise content if necessary (e.g. if a colour scheme has been agreed upon)
- ✓ Review the set of material in regards to quality
- ✓ Pilot the course and check if any technical issues occur

Dissemination of the STUDICODE Production Manual

To ensure the sustainability of the STUDICODE results after project termination and promote their uptake by stakeholders, representatives of selected target institutions will be involved throughout the lifetime of the project through "Multiplier Events".

Supporting documents to the Production Manual

- Didactic Concept
- Evaluation Kit (Educators)
- Report on first STUDICODE Multiplier Event:
  https://www.studicode.med.tum.de/en/stakeholder-event-receiving-suggestions-regarding-studicode-course