

# Caring about confusion

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# **Valorisation**

A valorisation is “*the process of creating value from knowledge, by making knowledge suitable and/or available for social (and/or economic) use and by making knowledge suitable for translation into competitive products, services, processes and new commercial activities*” (Promotiereglement Maastricht University, 2016). Basically, this means that the “knowledge” obtained in this dissertation should be made available and understandable for others to put it to (good) use, either to make the world a better place or to make money. The university has provided a series of topics to guide us through this valorisation addendum.

### **1. Societal and/or economic relevance**

Results from my research have shown that delirium recognition and guideline adherence for the management of delirium among older hospitalised patients is poor. This poor recognition and management leads to potentially increased percentage of people who develop a delirium, and to longer or more severe delirious episodes. Results from my dissertation have also shown that some interventions that are already incorporated in daily practice can reduce the duration of delirious episodes and increase in the use of screening for delirium in older patients. These results are both of societal and economic relevance: the adverse outcomes associated with delirium can be very severe, and the health care costs associated with delirium are high.

With regards to the societal effects: older patients suffering a delirium during hospitalisation run a 62% increased risk of mortality within twelve months after the hospital admission compared to patients who did not develop a delirium.<sup>26</sup> Other adverse outcomes include prolonged hospital stay, slower functional recovery, cognitive decline, institutionalisation after hospital discharge, greater chance of hospital readmissions, recurring delirium, and onset of dementia or deterioration of pre-existent dementia.<sup>27-30</sup> Patients also suffer from emotional or psychological distress after a delirious episode.<sup>31</sup> After recovering from a delirium, patients have been found to suffer from symptoms of depression, anxiety, and fear,<sup>32, 33</sup> and delirium may be a risk factor for the development of post-traumatic stress disorder (PTSD).<sup>34</sup> Taking into account that between 29 and 64% of older hospitalised patients develop a delirium, the results of this dissertation could potentially (positively) affect a lot of patients: shorter delirious episodes are beneficial for swifter functional and cognitive recovery. This dissertation also shows that delirium is severely under-recognised and under-reported. This knowledge is important because it shows there is a problem regarding recognition and adequate reporting of delirium, which may spark a discussion on the need to improve this. Early recognition of delirium may help in providing timely and adequate management, and reporting of delirium will help substantially in identifying patients with an increased risk of delirium during future hospital admissions, prompting the use of interventions to prevent delirium.

With regard to the economic effects: delirium places a serious financial burden on the health care system. Longer and more hospital admissions, long-term care institutionalisation, dementia; these are all adverse outcomes with high financial consequences. It has been calculated that delirium among older hospitalised patients costs more than US\$164 billion a year in the USA, which is comparable to the healthcare costs for falls or diabetes mellitus.<sup>35</sup> A German study team calculated what a patient with a hyperactive delirium actually costs the hospital excluding the costs for re-admissions or institutionalisation.<sup>36</sup> They found that patients with a hyperactive delirium costs on average €1200,- more than patients with no delirium, based on extra time spent by physicians and nurses, longer hospital stay, and additional medication costs. Thus, the medication review as described in this dissertation, which has found to shorten the delirious episodes for certain groups of patients, could potentially decrease health care costs for these patients. Moreover, the educational intervention described in this dissertation, lead to an increase in the frequency of screening for delirium, which could potentially identify more patients at risk, prompting preventive measures and thus preventing delirium.

## ***2. Target groups***

The results of this dissertation are relevant to various groups of people outside the research community, mainly health care professionals, health care insurers, educators and policy makers, though they may also be important for older patients and their family members.

The results regarding the recognition and reporting of delirium, as well as the management of delirium using both non-pharmacological and pharmacological interventions, such as a medication review or the use of antipsychotic medication is important for health care professionals (i.e. nursing staff and physicians). These results show that the guidelines for detecting, reporting and managing a delirium are often not adhered. The guidelines are based on scientific research and expert opinions, and were made to improve the care for patients who have a delirium or run an increased risk of developing one. Adhering to the guidelines may help to prevent delirium, or, as is the case for the medication review, shorten the duration of a delirium in certain patient populations. Fewer and shorter delirious episodes decrease workload and stress for nursing staff and could potentially decrease the hospital stay for some patients, making place for new patients who need medical care. This could in turn lead to a decrease in health care costs, which make the results of this dissertation interesting for health care insurers.

Delirium has been made and indicator of hospital quality (kwaliteitsindicator ziekenhuiszorg) by the Dutch health care inspectorate (Inspectie GezondheidsZorg, IGZ). As such, the results regarding recognition and guideline adherence are of interest to policy makers and hospital boards, as decreasing delirium and increasing guideline adherence can increase the quality of care as assessed by the

IGZ. This could lead to a higher ranking in the national ranking of hospitals in the Netherlands, and increase overall quality of care for older patients. This research is also of interest to policy makers, because the results show that just having the guidelines in place and facilitation delirium recognition by implementing the use of the Delirium Observation Screening scale (DOS) is not enough to warrant good delirium care. Policy makers could use these results to increase the focus of delirium, for example by making delirium a mandatory part of the list of possible side effects to be discussed with all older patients undergoing elective surgery.

### ***3. Products, services, processes, activities or commercial activities***

All my research was bundled into this dissertation, which is freely available upon request and includes, among others, an educational intervention, which can be used to educate health care professionals on how to recognise and manage delirium in a hospital setting. Moreover, this dissertation shows that simply providing delirium education for the nursing staff is not enough to create the needed change in clinical practice to improve delirium care: this should go hand-in-hand with education for the medial staff, an increased focus on delirium throughout the hospital, a mandatory thorough medication review for all older (at-risk) people admitted to hospital, and preferably providing good information to patients and family members (especially before elective surgery) on what a delirium is, how it can be prevented, and what the consequences are. Thus, a factsheet for non-medically trained people (laymen), was developed, which can be used to educate patients and family members, thus increase the focus of delirium throughout the hospital.

Furthermore, the knowledge created by the research presented in this dissertation has been disseminated in different ways over the past few years. Scientific articles have been published, which are available open-source on-line; the results were presented to fellow researchers and to health care professionals during national and international conferences. Knowledge was also disseminated through the newsletters of the Living Lab in Ageing & Long Term Care (Academische Werkplaats Ouderenzorg Zuid-Limburg) and the Academic Collaborative Centre for Sustainable Care (Academische Werkplaats Duurzame Zorg). The latter also has a website with information regarding the research presented in this dissertation (<https://www.duurzamezorgmaastricht.nl>). Moreover, health care professionals (nurse practitioners, geriatricians, clinical pharmacologists) and policy makers within the hospital were asked to co-author or participate in several studies, thus incorporating them in the process of improving knowledge and guideline adherence for delirium recognition and management.

### ***4. Innovation***

The research in this dissertation focussed on the daily practice in a hospital setting, and so no innovative products, services, processes activities or commercial

activities were created. This dissertation did, however, create an eye-opener for health-care professionals and policy makers, as the results made clear that just having guidelines does not mean that these guidelines are automatically adhered to. This could lead to policy makers having to find new and innovative ways to bring the guidelines concerning delirium to the attention of health care professionals: for example by making it mandatory to mention delirium as a possible (probable?) complication of hospital admission. This could increase awareness and sense of urgency among physicians. Moreover, by providing the previously mentioned factsheet and actively involving the patient and family members or carers in the process of delirium prevention and management, delirium recognition and care (thus guideline adherence) can be improved.

### ***5. Planning & realisation***

With regards to the implementation of the interventions described in chapters four and five (the medication review and the educational intervention), these specific interventions were fairly location-specific, as they were designed to be implemented in the MUMC+ with the resources available at the MUMC+. However, a medication review does not need to be exactly as described in chapter four of this dissertation: it can easily be designed to fit in with the available resources of any hospital, both academic and non-academic, as and all hospitals employ specialists in internal medicine, geriatricians and/or a clinical pharmacist to carry out these medication reviews. The same can be said for the educational intervention described in chapter five of this dissertation: this was designed to fit in with the needs and possibilities of the nursing staff of two specific wards in the MUMC+. However, the intervention was designed in such a way that it could be tailored for the specific wards, and could also be tailored for different hospitals.

The results of this dissertation are most valuable for hospital policy makers. They should use the knowledge to improve delirium care in their hospitals, for example through delirium education for the health care professionals, implementing medication reviews for all older patients admitted to hospital, and by providing the necessary means to (pro-actively) educate patients and family members about delirium, before delirium happens. Placing flyers on a ward is not enough: these are often not given to the people who need them (or given only after a patient developed a delirium), and are often not replenished once the flyers are gone.

In conclusion: delirium is serious, common, costly and often overlooked or mismanaged. Pro-active education (or at least timely information) should be presented to patients and family. Health care professionals should be educated about delirium, its recognition, prevention and management. This will be beneficial for patients, family members, health care professionals, health care insurers and the financial state of our health care system in general.