

# Department of Anesthesiology

## Division of Palliative Medicine

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### Head of Division

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### Research focus

- Ethical aspects in palliative care
- Family caregivers in palliative care and quality of care in the end of life
- Clinical-experimental research
- Research projects furthering the curriculum and medical education

### Structure of the Division

Professorship: 1  
Personnel: 50  
• Doctors (of Medicine): 8  
• Scientists: 6  
(thereof funded externally: 5)  
• Graduate students: 23

### Clinical focus areas

- Care for terminally ill and dying patients
- Pharmacological and non-pharmacological interventions for symptom alleviation and pain relief
- Support in finding reasonable therapy goals
- Coordination of care
- Consultation on advance directives and comparable documents

### Research

Health services research in palliative care examines the „reality“ of palliative care. It provides information about healthcare concepts under everyday conditions. In this way, health services research in palliative care answers questions that neither biomedical basic research nor classical clinical research can answer.

Clinical-experimental research at the Division of Palliative Medicine deals with innovative approaches to optimize the treatment of patients with severe diseases, e. g. technical applications in palliative medicine.

### Ethical aspects in palliative care

PI: Prof. Dr. C. Ostgathe, Dr. C. Klein  
One possible option for patients with symptoms refractory to treatment is palliative sedation (PS) that can be offered and performed after careful consideration of the clinical situation. Despite ethical implications, PS is seen as integral part of palliative care (inter-)nationally.

- The Division has been investigating PS since 2012. A documentation recommendation was completed and published in 2018.

Funding: Staedtler foundation

- A consortium project on sedation in specialized palliative care has been coordinated from Erlangen since 2017. The discussion on sedation in specialized palliative care in Germany and other countries has so far lacked a framework that differentiates between the various forms of sedation, taking into account clinical, ethical, and legal aspects. There is also a lack of data on the sedation practice and the experiences and assessments of different institutional representatives involved in decisions regarding sedation. Reliable empirical data with a detailed analysis of ethical and legal challenges are necessary, as well as an approach involving representatives of relevant professional groups (such as nurses and physicians) to develop conceptually and empirically substantiated recommendations for good practice in different forms of sedation in Germany. In order to address the deficits of sedation in the specialized palliative care in Germany, the consortium aims to develop conceptually and empirically justified recommendations for different forms of sedation in the inpatient and outpatient specialized palliative care.

Funding: BMBF

- Continuous sedation until death is particularly discussed from an ethical point of view. Experiences and attitudes towards continuous sedation until death of physicians will be assessed in an international project.

Funding: ELAN Fonds

### Family Caregivers in palliative care and quality of care in the end of life

PI: Prof. Dr. C. Ostgathe, PD Dr. S. Stiel (until 2017), Dr. M. Heckel (since 2018), PD Dr. S. Gahr

- Validation of the „Care of the Dying Evaluation (CODE)“ for deceased patients' informal caregivers in the German-speaking area

In 2018, the validation study on the „Care of the Dying Evaluation“ (CODE) assessing the quality of care by relatives of deceased patients in palliative medicine and other departments

was completed. The study was conducted in collaboration with the university hospital Mainz. The questionnaire was answered in writing by relatives who had accompanied the patient during the last three days of his life. The validation study and the results on the quality of care during the last three days of life in two German hospitals will be published in 2019. The questionnaire fulfils the statistical quality criteria of validity and reliability for survey instruments. It can be used for research and in practice and allows for international comparability. An international project (iCODE) incorporates the results of the present validation study.

Funding: DFG

- Hospice and Palliative Care in Bavaria: well connected – optimally cared for! (PallBayNet) Several inpatient and community palliative care providers established regional hospice and palliative care networks in Bavaria aiming at connecting different services. General patterns of work and collaboration, the organization and communication within networks and between partners were investigated. A best practice recommendation on the collaboration in networks was developed and published by the work group.

Funding: Bavarian State Ministry of Public Health and Care Services

- Predictors of anxiety and depression in patients with progressive, life-limiting disease - an exploratory analysis of hospice and palliative assessment 2007 – 2011

The retrospective analysis of data from the treatment and documentation routines of palliative wards, hospices, and other treatment providers of patients with progressive, life-limiting diseases explored the characteristics in which psychologically burdened patients differ from those without. The data on „depression“, „anxiety“, „tension“ and „disorientation, confusion“ from the validated symptom problem checklist of the Hospice and Palliative Survey (HOPE) served as markers for psychological stress.

- Coordination Office Palliative Care in the network of German Comprehensive Cancer Centers

In the first project phase from 2014 – 2017, a „best practice strategy“ for a structured integration of specialized palliative care in a Comprehensive Cancer Center (CCC) was developed using scientific methods. This includes both the integration of palliative medicine into the course of treatment and into the research and teaching activities of the individual CCCs. Since 2017, the implementation of best practice recommendations, the implementation and evaluation of the jointly developed standard opera-

tion procedures (SOP), joint documentation for the identification and evaluation of quality indicators, and the development of a needs-oriented medical education and training program have been started.

Funding: German Cancer Aid

### Clinical-experimental research

PI: Prof. Dr. C. Ostgathe, Dr. T. Steigleder

Clinical-experimental research at the Division of Palliative Medicine deals with innovative approaches to optimize the treatment of patients with severe diseases.

One research focus is medical applications in palliative medicine. This focus is represented by the working group PallMeT.

- GUarded by Advanced Radar technology-based DIagnostics Applied in palliative and intensive care Nursing (GUARDIAN)

In the care of seriously ill people, the recording of respiration and heartbeat may be necessary for crisis detection. The previously necessary derivation via electrodes on the patient's body and the connected cables limit the self-determination and quality of life of palliative and intensive care patients and lead to false alarms and complications such as mental confusion. GUARDIAN should enable the contactless monitoring of vital parameters to ensure health. Patients can change their position in the bed at will and move freely in a GUARDIAN-protected room. By using six-port interferometry as a new concept, all body movements are recorded in a contactless manner from a distance of up to several meters with previously unattained distance resolution in the micrometer range. Respiration and heartbeat are extracted from the temporal signal curve. The aim of the project is the research and prototypical development of a radar-based sensor that makes it possible to measure the vital signs heart rate and respiration of a patient without physical contact over distances of up to several meters. In 2017, collaborators from the Chair for Electronics Engineering at FAU developed a prototype of the radar sensor, which was tested by PallMeT in a clinical study with 30 healthy volunteers in 2018. Based on the study data, the radar system was adapted for a study with palliative patients at UK Erlangen, which is planned to be conducted in 2019. Funding: BMBF

- Evaluation of non-drug therapies using the example of music therapy

Music therapy is frequently used in palliative medicine among other no-drug therapies, like physiotherapy, arts therapy, and psychological and spiritual care. Since 2018, the work group PallMeT has been investigating the effects of music therapy on physiological parameters, like

heart rate, breathing rate, blood pressure, and the activity of the autonomic nervous system. The heart activity is measured by touchless radar-based monitoring (see project GUARDIAN). This project is executed in collaboration with University of Augsburg.



Project GUARDIAN: Preparation for the clinical study with healthy volunteers (Image: I. Gheith)

### Research projects furthering the curriculum and medical education

PI: Dr. T. Steigleder

Research focuses on studies of content as well as formal aspects of teaching palliative medicine with the aim of researching and developing better courses. Furthermore, psychological and physiological factors, such as the psychological phenomena endowment effect and loss aversion, as well as physiological factors, such as prenatal testosterone exposure, are research topics.

### Teaching

The Division of Palliative Medicine is an integral part of the teaching force for Medicine, psychogerontology, and Medical Process Management. In addition to the comprehensive curricular teaching, it offers workshops for medical students as part of the clinical team on treating palliative care patients with simulated patients under constant supervision and with structured feedback. Furthermore, we established a multi-professional seminar in 2013 that takes place once each term. Tutors and participants both comprise many different health professions.

The Division of Palliative Medicine offers the chance to accomplish a MD thesis or a dissertation in human biology as well as Bachelor's and Master's theses of many degree programs. A research workshop is also held for students writing their final thesis in the division.

### Selected publications

Heckel M, Geissdörfer W, Herbst F, Stiel S, Ostgathe C, Bogdan C. Nasal carriage of Methicillin-resistant *Staphylococcus aureus* (MRSA) at a palliative care unit: A prospective single service analysis. PLoS ONE 2017, 12(12):e0188940

Hofmann S, Hess S, Klein C, Lindena G, Radbruch L, Ostgathe C. Patients in Palliative Care – Development of a Predictive Model for Anxiety using Routine Data. PLoS ONE 2017, 12(8):e0179415

Herbst FA, Heckel M, Stiel S, Ostgathe C. [Development of empirical recommendations for regional hospice and palliative care networks in Germany: A qualitative study.] Zeitschrift für Evidenz, Fortbildung und Qualität im Gesundheitswesen 2018, pii: S1865-9217(18)30198-3

Will C, Shi K, Schellenberger S, Steigleder T, Michler F, Fuchs J, Weigel R, Ostgathe C, Koelpin A. Radar-Based Heart Sound Detection. Scientific Reports 2018, 8(1):11551

Stiel S, Nurnus M, Ostgathe C, Klein C. Palliative Sedation in Germany: Factors and Treatment Practices Associated with different Sedation Rate Estimates in Palliative and Hospice Care Services. BMC Palliative Care 2018, 17(1):48

Stiel S, Heckel M, Wendt KM, Weber M, Ostgathe C. Palliative care patients' quality of dying and circumstances of death - Comparison of informal caregivers' and healthcare professionals' estimates. American Journal of Hospice and Palliative Medicine 2018, 35(7):1023-1029