

Department of Anesthesiology

Division of Palliative Medicine

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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

Structure of the Division

Professorship: 1
Personnel: 50
• Doctors (of Medicine): 8
• Scientists: 6
(thereof funded externally: 5)
• Graduate students: 24

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, Dr. M. Heckel, 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 has been published in 2020. 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

- 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 operation 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. A third phase of funding (4 years) started in November 2020 focusing on timely integration of palliative care in cancer care, screening of palliative care needs, care of the dying and the care for family and informal caregivers.

Funding: German Cancer Aid

- National Strategy for Palliative Care in Pandemics (PallPan) in Germany

The Network University Medicine was founded by the Charité Berlin and the German Government as response to the current SARS-CoV2 pandemic. It is funded by the German Ministry of Education and Research. The Network aims to connect German Medical Schools and German University Hospitals to jointly develop a pandemic preparedness for the current as well as for future pandemic situations. The PallPan project explores pandemic effects in all settings of palliative care on patients with and without Covid-19, their families and health care professionals. The Division of Palliative Medicine Erlangen contributes in the work package on SARS-CoV2 pandemic response teams at micro, meso and macro level with regard to the care of severely ill patients with far advanced disease at the end of life and their families in the current pandemic. Purposeful sampled pandemic board members will be interviewed nation-wide regarding the composition, organization and authority of pandemic crisis teams with a focus on palliative care expertise and staff experiences on end of life care issues, solutions and challenges.

Funding: BMBF

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 that was conducted in 2019 and 2020. 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.

- Bio-interferometry for epilepsy diagnostics in pediatrics

By using six-port interferometry it is possible to record heart beat and respiration without physical contact through materials such as blankets, mattresses, clothes, wooden parts of the bed. Our working group is the only one worldwide exploring six-port interferometry in context of vital signs. The activity of the autonomic nervous system (determined by heart rate variability) is a possible biomarker in different diseases, eg in monitoring epileptic activity. During and immediately preceding an epileptic seizure ECG-analysis showed significant changes of heart rate variability. In 2020 we started to investigate the potential use of radar-based, touchless epilepsy diagnostics. The aim is to provide continuous monitoring and monitoring for patients who are restricted to interact such as toddlers and newborns.

Funding: BMBF



Patient and Public Involvement Committee of the Division of Palliative Medicine. Members are volunteers who share their perspectives as citizens and support the research team in different ways throughout the research process. (Image: I. Gheith, 2019-05-09)

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

Vogt A, Stiel S, Heckel M et al. Assessment of the quality of end-of-life care: translation and validation of the German version of the "Care of the Dying Evaluation" (CODE-GER) - a questionnaire for bereaved relatives. *Health Qual Life Outcomes* 2020; 18: 311. doi:10.1186/s12955-020-01473-2

Shi K, Schellenberger S, Will C, Steigleder T, Michler F, Fuchs J, Weigel R, Ostgathe C, and Koelpin A (2020) A dataset of radar-recorded heart sounds and vital signs including synchronised reference sensor signals, *Scientific Data*, Feb 13;7(1):50

Kurkowski S, Radon J, Vogt AR et al. Hospital end-of-life care: families' free-text notes. *BMJ Support Palliat Care* 2020. doi:10.1136/bmjspcare-2020-00239.

Heckel M, Vogt AR, Stiel S et al. The quality of care of the dying in hospital-next-of-kin perspectives. *Supportive care in cancer : official journal of the Multinational Association of Supportive Care in Cancer* 2020; 28: 4527-4537. doi:10.1007/s00520-020-05465-2

Heckel M, Sturm A, Stiel S et al. '... and then no more kisses!' Exploring patients' experiences on multidrug-resistant bacterial microorganisms and hygiene measures in end-of-life care A mixed-methods study. *Palliative Medicine* 2020; 34: 219-230. doi:10.1177/0269216319881603

Gahr S, Loedel S, Berendt J et al. Implementation of Best Practice Recommendations for Palliative Care in German Comprehensive Cancer Centers. *Oncologist* 2020; 25: e259-e265. doi:10.1634/theoncologist.2019-0126