The overall purpose of this thesis was to examine the effectiveness, meaningfulness and the feasibility of an intervention, visualization used as an adjunct to usual analgesics to manage pain and anxiety during RF ablation of atrial fibrillation and other minimally invasive procedures. Patients undergoing ablation of atrial fibrillation often experience significant discomfort and pain, despite pharmacological during the procedure. Visualization has been successfully used during other invasive procedures to manage pain and anxiety. By using non-pharmacological intervention in combination with conventional analgesics, potential side effects and overdose of strong pain medication could be avoided, thus increasing patient safety and well-being. Study 1, a quasi-experimental study showed that use of visualization together with the usual pain medication reduced the amount of pain medication (Fentanyl) statistically significant in the intervention group compared with the control group. During the procedure, patients expressed spontaneous pain significantly fewer times in the intervention group. However, there was no difference in the experience of pain intensity between the two groups and no difference was observed in measurements of anxiety, procedure length and the number of adverse events in the two groups. From study 2, a qualitative interview study two main themes were identified: "Stimulating Patients Own Resources" and "Being Satisfied without Complete Analgesia." Visualization was reported as a positive experience without serious side effects. Patients achieved some pain relief by visualization and were supported in their own individual strategies for the management and control of pain and anxiety. Results from study 3 and 4 a protocol and a systematic review with ten studies included showed that visualization was effective in reducing the consumption of pain medication used during minimally invasive procedures despite the poor effect on pain intensity and anxiety. The studies included were difficult to compare with regard to measurements and reporting results, which excluded a meta-analysis on several "outcomes". From study 5, a mixed methods study three themes were identified: "Zero pain is not always the goal"; "Not a real procedure reduction, but a sense of time shrinkage" and "Importance of nurses' presence, visualization or not." Patients' own resources to cope with the pain were supported, but the pain intensity did not seem to be affected. The patients experienced the pain, but did not need to "go into the pain". It should therefore be questioned whether the effect of an intervention such as visualization should be measured in terms of pain intensity with a numerical rating scale. Although the patients did not experience severe anxiety during the procedure, they expressed that the close proximity of the staff was of major importance to the fact that they felt safe during the procedure. Despite a long treatment time, patients using visualization felt that they had experienced a short treatment time. From this thesis, visualization was found to be effective and meaningful for patients in pain management during ablation of atrial fibrillation. Furthermore, visualization appeared to be a feasible intervention that could be used in daily clinical practice without additional resources being required.
To fulfill the requirements for the PhD degree, Marianne W. Nørgaard has submitted the thesis: Visualization, a Strategy for Patients to Manage Pain, to the Faculty Council of Medicine at Aalborg University.

The Faculty Council has appointed the following adjudication committee to evaluate the thesis and the associated lecture:

**Professor João Luís Alves Apóstolo**  
*Department of Nursing Science, University of Coimbra*  
*Portugal*

**Dr. Elvira V. Lang, MD, FSIR, FSCEH**  
*Founder & President of Comfort Talk®*  
*Boston, MA, USA*

Chairman: Associate Professor Birgitte Schantz Laursen  
*Aalborg University Hospital*  
*Denmark*

Moderator: Associate Professor Mette Grønkjær  
*Aalborg University Hospital*  
*Denmark*

The PhD lecture is public and will take place on:

**Thursday 26 April 2018 at 14:00**  
at Rigshospitalet, Auditorium 2  
Blegdamsvej 9, 2100 København

**Program for PhD lecture on**

**Thursday 26 April 2018**  
by  
**Marianne W. Nørgaard**

Visualization, a Strategy for Patients to Manage Pain

Chairman: Associate Professor Birgitte Schantz Laursen  
Moderator: Associate Professor Mette Grønkjær

14.00 Opening by the Moderator  
14.05 PhD lecture by Marianne W. Nørgaard  
14.50 Break  
15.00 Questions and comments from the Committee  
Questions and comments from the audience at the  
Moderator’s discretion  
17.00 Conclusion of the session by the Moderator

After the session a reception will be arranged hosted by the Heart Centre