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☰ ABSTRACT SUMMARY

## Author information

#	Name	Last Name	Email	Submitting	Presenting	Corresponding
1	Damijan	Miklavčič	damijan.miklavcic@fe.uni-lj.si	✓	✓	✓

## Title, content, keywords, and sessions

**Title:** Pulsed Field Ablation – gaps in knowledge and future directions of development

**Body:** Pulsed Field Ablation is a new ablation modality based on irreversible electroporation. Since first proposed (and soon abandoned in 1980s due to major risks and side effects) it has gained traction following the development of irreversible electroporation in 2000s. PFA is now approved for atrial fibrillation treatment in Europe and by the FDA. The drive propelling the rapid uptake by cardiac electrophysiologists is its superior safety and speed with respect to cryo- and radiofrequency ablation and its comparable efficacy as evidenced by available clinical studies. It seems that we have “tamed the lion” in the last two decades. Preclinical and clinical results indeed provide expected results with respect to safety by almost complete absence of “standard” complications of cryo- and RF-ablations: phrenic nerves, pulmonary veins, and esophagus damage and most rare but feared atrio-esophageal fistula. Somewhat unexpectedly, other complications have been reported: most notably cardiovascular spasm and hemolysis, but also silent cerebral emboli and phrenic nerve palsy have been reported. Can we expect more and others when numbers of treated patients will increase, and new PFA systems will be introduced into the market? Somewhat disappointing was relatively low efficacy, i.e. comparable to cryo- and RFA (but still long-term follow-up results are missing). It needs to be emphasized that any new technology requires optimization (also from a procedural standpoint) It also seems fair to note that results obtained by PFA first generation devices are unfair to be compared to those obtained by RFA systems that benefited of decades of perfecting them. Much so also for cryoablation. How can we address the new safety and/or therapy related concerns such as hemolysis, coronary spasm, cough, neuromuscular stimulation? Can we improve the efficacy? Is there a magic waveform that balances off safety concerns while it improves efficacy? Is there a way to compare different PFA systems? How will regulators enable new and improved waveforms and devices to get on the market for the benefit of the patients? How can improved understanding of electroporation and basic research help address these questions.

**Keywords:** cardiac ablation; research; side-effects; cardiac arrhythmias.

**Session(s):**

P3 - Irreversible electroporation [main track]

S21 - Cardiac ablation by irreversible electroporation - pulsed field ablation (PFA) [special]