
2nd Department of Internal Medicine – Gastroenterology

The 2nd Internal Gastroenterology Clinic belongs to tertiary, university centres providing care in the full spectrum of gastroenterological, hepatological and rheumatological diseases. The department is accredited for postgraduate training in rheumatology and gastroenterology and specialty training for certification examinations in both fields. The department includes Centres for biological treatment of idiopathic intestinal inflammation and rheumatological diseases. The Endoscopy Unit has been granted the status of a Center for Mesenchymal Stem Cell Therapy (used in the treatment of complicated IBD) in 2022 and a Center for Highly Specialized Care for Digestive Endoscopy in 2023. An important activity is the organization or co-organization of professional and educational events, both domestic (Hradec gastro-enterology days, Meeting of East Bohemian Rheumatologists) and international (Prague Hepatology Meeting, etc.). The scientific and research activity of the department is based on clinical and experimental research, which has resulted in numerous lectures at national and international congresses, grants and professional publications. The department has been involved in the past and is currently involved in multicentre research (cooperation with the Central Military Hospital and 1. LF Charles University in Prague, Faculty of Pharmacy of Charles University in Hradec Králové, Faculty of Informatics and Management of the University of Hradec Králové, Faculty of Military Health - University of Defence in Hradec Králové and the Academy of Sciences of the Czech Republic) and international research activities, where it cooperates with Katholieke Universiteit, Leuven (Belgium) and Jesús Usón Minimally Invasive Surgery Centre, Cáceres (Spain). Among the long-term projects of the department, in the field of gastroenterology, besides experimental endoscopy on a large laboratory animal, we should also mention the use of automatic systems for detection of endoscopic findings and artificial intelligence in gastrointestinal endoscopy, the problem of *Helicobacter pylori* infection, diseases and endoscopic diagnosis of small bowel diseases, portal hypertension and TIPS, breath tests, POEM (oral endoscopic myotomy) in achalasia, rare polyposis of the alimentary canal and confocal laser endomicroscopy in the diagnosis of cystic tumours of the pancreas.

Main research topics

1. The use of artificial intelligence in gastrointestinal endoscopy (development and testing of artificial intelligence systems in automatic evaluation of colonoscopy and capsule endoscopy findings). doc. MUDr. Ilja Tachecí, Ph.D.
2. Needle confocal laser endomicroscopy in the differential diagnosis of cystic pancreatic tumors (verification of the benefit of laser endomicroscopy and selected diagnostic procedures involving the investigation of nucleic acids of tumor cells (tumor genome) for the purpose of planned identification of somatic mutations, currently awarded a grant in the Internal Grant Competition of the Faculty of Medicine). MUDr. Rudolf Repák
3. Pain as a phenomenon in systemic connective tissue diseases (accepted GAČR grant: Signaling pathways affecting human TRPC5 receptor function: prediction of their relationship to pain in rheumatoid arthritis). doc. MUDr. Tomáš Soukup

Scientific research groups

1. doc. Tachecí, Mgr. and Bc. Knoblochová and Sr. Klusáková: Focus on experimental gastroenterology.
2. doc. Soukup, dr. Jansová, dr. Tomš: The importance of the gastrointestinal microbiome in relation to the clinical manifestations of systemic scleroderma

The research team of the 2nd Internal Medicine Clinic consists of academicians (doc. Tachecí, doc. Soukup, prof. Rejchrt), doctors of the 2nd Internal Medicine Clinic (dr. Cyrany, dr. Repák, dr. Tomš, dr. Fejfar, dr. Morávková), postdocs (dr. Šembera), students of the doctoral program (dr. Douda, dr. Veleta) and researcher Mgr. Bc. Knoblochová. Other doctors, nurses, researchers and academics from other domestic and foreign institutions are also involved in science and research on an ad hoc basis.

Equipment

1. Confocal laser endomicroscopy system (special imaging of the gastrointestinal mucosa, ducts and cystic tumours allowing more accurate identification of premalignant or early malignant changes).
2. Cholangioscope (an instrument allowing endoscopic imaging of the surface of the bile ducts).
3. Capillaroscope (an instrument allowing the evaluation of typical changes of capillaries in systemic connective tissue diseases).

4. Capsule endoscopes (endoscopes in the form of a plastic pill allowing a comprehensive examination of the small and large intestine after swallowing).

Achievements

The department performed the first examination by double-balloon enteroscopy in the Czech Republic and, together with the Prague IKEM, it was one of the first departments to perform examination of the small intestine by capsule endoscopy and to treat patients with oesophageal achalasia by the technique of oral myotomy (POEM). The clinic collaborated in 1992 on the first introduction of TIPS (transjugular intrahepatic portosy-temal shunt). The clinic has in-house, more than 10 years of experience in research projects with experimental pigs. The research team has developed and published, for example, priority studies on experimental capsule enteroscopy (Tachecí et al. Dig Dis Sci 2010) or experimental electrogastrography (Tachecí et al. BMC Gastroenterol 2013), which were associated with the development and validation of original experimental examination methods and proposals for their use in research practice. The clinic was a co-principal investigator of several European projects (Trai-ning of soft skills for surgical teams using an immersive serious game. 2018-1-ES01-KA202-050943 (doc. Tachecí), IT4Neuro (degeneration) CZ.02.1.01/0.0/0.0/18_069/0010054 (doc. Tachecí, dr. Šembera). The authors of the 2nd Internal Medicine Clinic described for the first time in Europe a new polyposis with gastric involvement and high risk of carcinoma (Repak R et al. The first European family with gastric adenocarcinoma and proximal polyposis of the stomach: case report and review of the literature. Gastrointest Endosc. 2016 Oct;84(4):718-25) and contributed to the development of practice guidelines (Tacheci I et al. Gastric adenocarcinoma and proximal polyposis of the stomach (GAPPS) - A Helicobacter-opposite point. Best Pract Res Clin Gastroenterol. 2021;50-51:101728).