

The importance of interdisciplinary research

Petr Widimsky*, Ivana Stetkarova, and Petr Tousek

Cardiocenter, Third Faculty of Medicine, Charles University and University Hospital Kralovske Vinohrady, Ruska 87,
100 34 Prague 10, Czech Republic

History of medicine aim at the healing of ill persons either orientated towards medical thinking or laying emphasis on medical ethics.¹

The entire history of medicine is characterised by the gradual development of specializations. For many centuries, the only ‘specialty’ was the physician. Until the beginning of the 19th century, most of the manual procedures in surgery or obstetrics were performed by non-medical people—essentially craftsmen (wound-healers, barber-surgeons, midwives, etc.). In the 20th century, medicine developed extensively and knowledge and skills were so great that many specializations were inevitably developed.

However, medical specialization, far from being a recent phenomenon, existed in the Hellenistic world and in Rome. The development of specialization during the latter part of the 19th century and early 20th century is credited to the rapid expansion of medical knowledge which made it impossible for a single doctor to encompass all the different spheres of the profession.²

Today, there are nearly 100 medical specialties in the world, of which at least 30 are considered to be basic medical specialties. The study of medicine usually lasts 6 years, followed by a further 4-6 years of specialised training, before a doctor can work as an independent specialist in the relevant field. An undeniably positive result is the top quality of specialists trained in this way. However, a challenge to this development is often the fact that these specialists and superspecialists do not have knowledge or experience in other areas of medicine, which can lead to diagnostic errors. This development is even more pronounced in the field of scientific research in medical disciplines. One way to reduce the risk of the negative impact of superspecialization on medical practice and research is interdisciplinarity: the collaboration of experts from different fields for the benefit of patients and the advancement of scientific knowledge.

I will take the liberty to characterise this development and context very briefly using the

example of cardiology. From the original broad field of ‘medicine’, the largest non-surgical field of ‘internal medicine’ has differentiated. From it, first neurology and later other internal medicine disciplines separated—of which cardiology was the first. Whereas 50 years ago, every internist was also a cardiologist and every cardiologist was an internist, today virtually no cardiologist can know all the disciplines of internal medicine. However, specialization continues even within cardiology: electrophysiology (arrhythmology), interventional cardiology, angiology, acute cardiology, etc. have become subspecialties in their own right. From the point of view of scientific research, superspecialization goes even further.

In this issue of the *European Heart Journal Supplements*, my co-workers from the Third Faculty of Medicine (Charles University) and University Hospital Kralovske Vinohrady in Prague present the results of their recent research. With only one exception all these manuscripts present interdisciplinary research.

Our university and its hospital has long (>10 years) history of very close, open and friendly interdisciplinary cooperation in stroke research and stroke treatment. Cardiologists, neurologists, radiologists, neurosurgeons, vascular surgeons, internists, anaesthesiologists, and rehabilitation specialists work closely together to improve the previously grave outcomes of patients with severe ischaemic strokes.³⁻⁵ The paper of Mihalovic *et al.*⁶ on prevalence of myocardial injury in acute ischaemic stroke is an example of this cooperation.

A nice paper of Hozman *et al.*⁷ on antithrombotic therapy and upper gastrointestinal bleeding was prepared jointly by cardiologists, gastroenterologists, abdominal surgeons, and anaesthesiologists.

Bauer *et al.*⁸ present original data on pre-hospital delay, clinical characteristics, angiographic findings, and in-hospital mortality in young and middle-aged adults with acute coronary syndrome. Data were collected in cooperation between cardiologists and industry experts.

The importance of interdisciplinary cooperation was also shown in the paper of Karolina Polednikova and colleagues. Acute onset of symptoms with suspicion of acute coronary syndrome can be seen in patients

*Corresponding author. Tel: +420 267162621, Email: petr.widimsky@lf3.cuni.cz

hospitalised with severe non-cardiac disorders. The close interdisciplinary approach to these patients can lead to the rapid diagnosis of Takotsubo syndrome which is triggered by physical (acute non-cardiac disease) stressors.

And finally, Sussenbek *et al.*⁹ studied physiological pacing in patients with left bundle branch block and heart failure. This work was completed by cardiologists, anaesthesiologists, technology researchers, and basic science specialists.

In their previously published papers, Herman *et al.*¹⁰ showed that hybrid ablation of atrial fibrillation (combination of thoracoscopic and percutaneous ablation) is associated with a higher risk of cognitive decline. This study was done in cooperation between cardiologists, cardiac surgeons, neurologists, and psychologists. In cooperation with radiologists, neurologists, cardiologists, and interventional angiologists, we found that the presence of leptomeningeal collaterals along with the absence of leucoaraiosis predicts a good outcome in acute stroke patients after successful recanalization.¹¹

Thus, we firmly believe that close interdisciplinary cooperation is the optimal way to overcome the drawbacks of superspecialization in medicine.

Funding

This manuscript was supported by the Charles University Research Program “Cooperatio Cardiovascular Sciences”.

Conflict of interest: None declared.

Data availability

No new data were generated or analysed in support of this research.

References

1. Roth G. History of medicine and pastoral medicine. *Wien Klin Wochenschr* 1991;**103**:484-486.
2. Echenberg D. A history of internal medicine: medical specialization: as old as antikivty. *Rev Med Suisse* 2007;**135**:2737-2739.
3. Widimsky P, Snyder K, Sulzenko J, Hopkins LN, Stetkarova I. Acute ischaemic stroke: recent advances in reperfusion treatment. *Eur Heart J*; doi: 10.1093/eurheartj/ehac684. Published online ahead of print 2022.
4. Widimský P, Štětkařová I, Malíková H. Interdisciplinary cooperation for a maximum acceleration of availability of modern therapy for ischemic stroke for all patients in need of endovascular thrombectomy. *Vnitř Lek* 2019;**65**:606-609.
5. Sulženko J, Kožnar B, Peisker T, Vaško P, Vavrová J, Štětkařová I *et al.* Stable clinical outcomes when a stroke thrombectomy program is started in an experienced cardiology cath lab. *JACC Cardiovasc Interv* 2021;**14**:785-792.
6. Mihalovic M, Mikulenka P, Linková H, Neuberg M, Štětkařová I, Peisker T *et al.* Prevalence of myocardial injury in patients after acute ischemic stroke according to standard criteria. *Eur Heart J* 2023, in press (this issue).
7. Hozman M, Hassouna S, Grochol L, Waldauf P, Hracek T, Zborilova Pazdiorova B *et al.* Previous antithrombotic therapy does not have an impact on the in-hospital mortality of patients with upper gastrointestinal bleeding. *Eur Heart J* 2023, in press (this issue).
8. Bauer D, Neuberg M, Nováčková M, Kočka V, Toušek P. Pre-hospital delay, clinical characteristics, angiographic findings, and in-hospital mortality in young and middle-aged adults with acute coronary syndrome: a single-center registry analysis. *Eur Heart J* 2023, in press (this issue).
9. Sussenbek O, Rademakers L, Waldauf P, Jurak P, Smisek R, Stros P *et al.* Left bundle branch area pacing results in more physiological ventricular activation than biventricular pacing in patients with LBBB and heart failure. *Eur Heart J Suppl* 2023, in press (this issue).
10. Herman D, Javůrková A, Raudenská J, Budera P, Rizov V, Kačer P *et al.* Changes in cognitive function after thoracoscopic and catheter ablation for atrial fibrillation. *Pacing Clin Electrophysiol* 2023;**46**:84-90.
11. Peisker T, Vaško P, Mikulenka P, Lauer D, Kožnar B, Sulženko J *et al.* Clinical and radiological factors predicting stroke outcome after successful mechanical intervention in anterior circulation. *Eur Heart J Suppl* 2022;**24**:B48-B52.