Multidisciplinarity in emergency and critical care medicine: Specific care is best care!

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Emergency and critical care medicine have grown into robust self-supporting disciplines with an increasing demand for dedicated highly-skilled physicians. In earlier time, "core" specialists were asked to offer bedside advice in acute care wards. Yet, the "acute" patient often lacks the typical features of a particular pathology but rather displays a subacute, hyperacute or "patchwork"-like disease pattern. Moreover, it becomes increasingly difficult for an entirely "organ-focused" physician to discern the multitude of potential pitfalls that complicate diagnosis and treatment in an acute setting.

From the above, it is obvious that acute care departments need to be manned with "specialized" acute care physicians to ascertain timely diagnosis and adequate treatment of patients.[1] The list of involved subspecialities is steadily growing and has recently welcomed nephrology, infectious disease, pharmacology, and endocrinology.[2] Of course, no single intensive care or emergency physician is able to remain fully updated on the ever expanding knowledge and practice regarding these subspecialities.[2] Nephrology, for example, has evolved at such pace over the past decades that it needed to be subdivided in dialysis chronic care, kidney transplantation, peritoneal dialysis, and critical care nephrology, each focusing on a specific patient population.[3,4] From its creation almost 20 years ago,[5] critical care nephrology progressively has claimed a key partnership in acute care. Many critical care physicians — some of them even without a specific nephrologic background — have become highly qualified international experts in the management of acute kidney injury. Critical care nephrologists can also tackle specific aspects of acute care. One such issue is antimicrobial "fine-tuning" in patients undergoing continuous renal replacement therapy (CRRT). When adapting currently accepted antimicrobial dosing guidelines in CRRT, a majority of patients will be left underdosed.[6] This is unacceptable since it exposes them to inadequate treatment and will induce resistance.[7] Thanks to the outstanding pioneer work of several groups, dose adaptation regimens for antimicrobial drug therapy under CRRT have been created and molded in workable bedside schemes.[8-10] Pertinent clinical applications are the use of a loading dose followed by continuous infusion for administration of time-dependent antibiotics and the use of considerably higher bolus doses of concentration-dependent antibiotics.[7-10] Another example is the recently re-discovered cardio-renal syndrome. Hereupon, the associated viewpoints of critical care nephrologists, cardiologists, and intensive care physicians[11] allowed a better insight in pathophysiology and a more efficient therapeutic approach.[12] Importantly, the coordination of all logistic issues on intermittent and continuous dialysis in an ICU setting[13] enables to generate sufficient financial resources to engage a critical care nephrologist!.[4,14]

Subspecialities such as infectiology, pharmacology, and endocrinology also fulfill an indispensable role in daily ICU management.[15] Critical care infectiology focuses (on a 24/7 basis!) on antimicrobial treatment options in typical emergency and ICU conditions (*e.g.* reanimation, acute

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shock resuscitation,…). In addition, advice of the infectious diseases specialist can be summoned in various challenging situations that may not or only partly be appreciated by a "general" infectiologist (*e.g.* prevention and treatment of emerging multi-drug resistant ICU pathogens,[16] antibiotic dosing in patients undergoing complex therapies (*e.g.* extracorporeal membrane oxygenation, CRRT, burn treatment,…).[10,17]

Life-threatening drug-drug interactions have been described in approximately 15% of ICU patients.[18, 19] Also, up to 10% of ICU admissions are due to drug overdosing or interactions occurring in general wards.[20] As shown recently,[21] the introduction of critical care pharmacology as a "satellite" of its clinical counterpart can dramatically reduce these harmful events and thus improve patient safety and outcome.[21,22]

Protracted illness and its inherent metabolic and hormonal changes have paved the way for critical care endocrinology.[23] By unravelling the intricate hormonal pathways and stress interactions that accompany a stay in the ICU, this relatively new subspecialty will probably contribute in lowering morbidity, length of ICU stay and mortality.[24]

In conclusion, polyvalence is no longer a valid option in modern critical care. Uniting forces between disciplines represents the only way to cope with the increasing complexity and cumulating know-how in the critical care setting. For this reason, the wide array of upcoming acute care subspecialities must be committed unrestricted growth and development. This will require competent manpower, a well-designed technical framework, and sufficient financial support. The worldwide success of critical care nephrology proves the feasibility of this concept.

It is time to say goodbye to the omniscient intensivist and to welcome constructive multidisciplinarity!

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