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Does interprofessionality work in Swiss ICUs and should it be encouraged?

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Summary

A charter for the collaboration of healthcare specialists has recently been proposed by the Swiss Academy of Medical Sciences, to promote interprofessionality in daily clinical practice. This article reviews several aspects of this concept, from definition and basic principles to the potential benefit for the patients and caregivers, and it discusses the difficulties in implementing interprofessional teamwork in the daily practice of an intensive care unit (ICU). Although collaborative and interprofessional teamwork seems a logical approach in the care of critically ill patients, little published evidence shows that it really improves the level of care, meaning that this may be harder to implement than to promote. Eventually, some clues to achieve a successful realisation of interprofessional collaboration in the ICU are proposed.

Key words: *interprofessionality, teamwork, intensive care medicine, educational training, critically ill patient*

What is interprofessionality?

All definitions of interprofessionality encompass the collaborative engagement in a complex task of professionals with specific knowledge and competencies, heading to a common goal. Interprofessional work is not just simple coordination, but represents the highest level of team interaction, when members work in an integrated and interdependent way, with shared identity and responsibility [1]. In 2003, the US Institute of Medicine (IOM) defined interprofessional teamwork as the collaborative interaction of healthcare professionals to provide high quality and individualised care [2]. The most important components of interprofessionality in medicine were identified as appropriate team structure, abolition of rigid hierarchies and promotion of shared decision making [3].

In 2010 report, the World Health Organization recognised that interprofessional collaboration was an "innovative strategy that will play an important role in mitigating the global health workforce crisis" [4]. Interprofessional healthcare was defined as the capacity "to understand how to optimize the skills of members, share case management and provide better health-services to patients and the community". Key components were identified both in education and practice. In education, various professions should engage in common teaching activities, learning about, from and with each other, in order to develop a sense of effective collaboration, and to become "collaborative practice-ready" people. In clinical practice, they bring their individual knowledge and skills to achieve a common goal, taking care together of patients and relatives, with the highest level of quality. Such a level of interprofessional collaboration can be achieved only with active policies; therefore, health policy-makers were strongly encouraged to use adequate tools to reach this goal, such as the identification and support of local champions, the necessary change of health workers culture and attitudes, the revision of training curricula, and the development of appropriate legislation rules.

In Switzerland, back in 2007, the Swiss Academy of Medical Sciences (SAMS) proposed a charter to promote the collaboration of healthcare specialists, a document that was later published in 2014 [5]. As a basic principle of this charter, healthcare professionals are encouraged to engage in high-quality and optimal level care, adapted to the needs and expectations of the population, with patients as the focus of care and as active partners. Other fundamental resolutions are the concerted and clear definition of respective tasks and responsibilities, the development of common teaching modules in networks, and the adaptation of the organisation of work.

Are nurses and physicians really practicing interprofessionality?

Nurses and physicians have distinct educational tracks, different levels of knowledge, specific skills and competencies, specific and different perspectives on the patient, and even unique corporate identities. We differ in experience, work organisation and clinical practice, but we have a lot in common: we share our patients, their relatives, and we work in joint collective organisations, within our hospitals and units. We therefore are like theatre actors, sharing a unity of place, time and action, with the patient at the centre. Even though differences should not be denied, they should be overcome, and we should seek ways to build efficient collaborative teams, and this is the basis of the Swiss charter for interprofessionality.

Historically, the decision-making power was held by physicians, because of their higher academic educational

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level. Nurses were simply considered supportive auxiliaries, applying decisions taken by physicians alone. Even the nurses' hierarchical structure was under physicians' dominance. Progressively, nurses developed specific knowledge and technical skills, mostly in domains where physicians were not willing to be involved in anymore. From the late 1970s, nurses were progressively integrated in the decision process, initially by bringing information and only making passive recommendations, the leadership still in the physicians' hands [6]. In the early 1990s, it was recognised that nurses could make their own decisions, within the limits of their competence and knowledge [7]. In parallel, apart from the classical practical non-university-based nurses' educational track, a higher level of education gradually emerged, culminating in university-based programmes and academic certifications. These two nurses' educational tracks should be viewed as additional and not as discordant or mutually exclusive. These changes in the nurses' curriculum stimulated the development of interprofessionality.

In parallel, interprofessional educational activity always existed: physicians have been involved in nurses' education, and experienced nurses give advice and teach young residents in many practical aspects of their work. Most physicians should acknowledge the role of nurses and other non-physician professionals in the development of useful professional competencies [8]. But the evolution of the nurses' educational track, together with some degree of decreasing physicians' skills, paved the way towards increased interprofessional cooperation, from more organised collective training to collaborative teamwork in clinical activities.

But do these developments really translate in the clinic? It seems that interprofessionality still remains hard to apply effectively in the field. Nurses and physicians may not be able to correctly assess the pros and cons of such a level of collaboration, with a feeling that there is more to lose than to gain. Particularly, the sense of losing definite borders separating professions may be very strong: physicians are not willing to abandon some of their "historical" prerogatives, and nurses very often fear that they will be dominated [9]. In this context, and despite support from various authorities, evidence of successful top-down implementation of interprofessionality is often difficult to find.

Can we measure the benefit of interprofessionality?

Even though it seems difficult to challenge the interest of increasing interprofessionality in medicine, the balance between positive and negative consequences may be difficult to assess, as they could also differ with regard to the patients' outcome or to the working conditions of nurses and physicians. Ideally, the effect of a better interprofessional collaboration should be the improvement of significant patient-centred outcomes, such as mortality or morbidity, but also related to increased patient comfort, satisfaction or "good care" experience.

Although a great amount of medical literature shows that interprofessional training, particularly with simulation, does increase global competence of caregivers and teamwork coordination [10–12], there is only scanty evidence that this really translates into interprofessional collaborative teamwork in daily activities, and to improved outcomes [13]. A recent Cochrane review found only nine relevant studies, with great heterogeneity in the interventions and settings, and also significant methodological weaknesses, and could therefore not draw any conclusion on the effect of interprofessional education on outcomes [14].

Regarding the satisfaction of caregivers, the literature generally seems very enthusiastic, principally in review or concept papers [15], but there are few objective published data to support this enthusiasm [16, 17]. In summary, even if it is tempting to think that better collaboration between health workers favours collective competence development and enhances job satisfaction, logically allowing improvement of care, and consequently improving outcomes, this still has to be demonstrated.

Do we need to support interprofessionality in the intensive care unit?

The intensive care unit (ICU) is a complex and stressful universe, where admitted patients present intricate clinical problems, with possible quick changes in the situation and often a significant risk of dying. The difficult management of ICU patients therefore requires the collaboration of various professionals (nurses, physicians, therapists, dieticians, pharmacists, etc.), mixing their levels of knowledge, skills and competencies, from young residents/nurses to "old" and experienced physicians/nurses. Patients depend for their survival on this collective expertise and on the effective collaboration and cohesion of the team, particularly to avoid errors [18, 19]. Not surprisingly, interprofessional tensions may therefore arise in the ICU [20], resulting from conflicts of authority, differences in the levels of education, knowledge or experience, but also from various perceptions of patient needs. Eventually, restraints in resources and time amplify these strains. If we remember that our mission as caregivers is to deliver high-value care to patients, it should help us to overcome the barriers for the implementation of interprofessionality in the ICU, and decrease the resistance. But this does not seem to be enough to overcome our natural tendency to work on our own.

Lingard et al. described ICU teamwork as a game of power, with variable intensity, depending on circumstances, and based on rituals of "ownership and trade" [21]. The ICU team is a compilation of individuals with distinct professional identities, different skills and knowledge, diverse economic situations, and very often competitive "political" agendas. A way to decrease these tensions is to separate territories and to avoid direct confrontation, in an atmosphere of "fair cooperation" or cold peace (or war!). But Lingard et al. proposed a move towards a more authentic and ambitious model of collaboration that requires skills to function together. In this model, each individual and each profession should identify its "valued commodities", such as its specialised knowledge and technical skills, and its own control of specific technical equipment, all these elements culminating in the clinical territory around the patient. This allows "small" negotiations involving the members of the team in their daily clinical practice, in order to better define these commodities' ownership and rule their trade. Territories can move, depending on the individuals and the circumstances, thus avoiding conflicts if the process is well appreciated and correctly handled. By bet-

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ter knowing the "valued commodities" of each other, team members can anticipate negative reactions and avoid obstructive behaviours, with the goal of maintaining team cohesion without increasing frustration. Very basic examples of such negotiations are the practice of arterial puncture by the nurse when the resident does not succeed, or the placement of a nasogastric tube by an experienced physician when the nurse failed.

Interprofessional collaboration should therefore be based on the mutual consideration of all that "makes" individual ICU team members, and also on the awareness of potential barriers to this collaboration and on the knowledge of interventions that can facilitate it. In order to ensure patient safety, members of a mature ICU team must share responsibility for decision making, problem solving, conflict management and coordination of care [22–24]. Will this translate in better outcome for patients? Although it is tempting to think that better collaboration is always linked to better care, and thus to better outcomes, it has to said that firm evidence for this does not exist [25]

Are there examples of successful interprofessional collaboration in the ICU?

Many daily ICU clinical activities are based on interprofessional collaboration. Multidisciplinary rounds should be mentioned first, because they represent the symbol of interprofessional interactions in the ICU. Focusing on the patient and bringing together all the members of the ICU team in a well-defined and limited time range, they allow for real-time exchange of information, discussions about goals and plan of care, and sharing of common or not-so-common concerns regarding the situation of the patient. This privileged moment, with a unit of time, place and action, is one of the key elements associated with improved outcome and good resource utilisation in the ICU [26–28]. If it is the interprofessionality behind the rounds that explains these beneficial effects remains difficult to prove based on such descriptive data, but it seems common sense that if you bring an orchestra into a room and if they don't play all together the same piece, the music will be unpleasant. This may be exactly the same in the ICU!

Complex techniques of care that are used in the ICU are other examples of successful interprofessional work, both regarding education and clinical application. Among these is cardiopulmonary resuscitation (CPR): application of easy-to-use algorithms is not enough, and effective leadership and teamwork hierarchical organisation and functioning are of paramount importance, to develop "smooth" working mechanisms within the team, and possibly improve the outcome of the CPR [29].

Mechanical ventilation is another complex and technical intervention that depends upon interprofessional collaboration. Historically, the role of physicians and nurses or respiratory therapists was very distinct: physicians decided on the ventilator modes and variables, and defined targets and limits, and the nurses (or therapists) delivered the ventilation, trying to stay in the targets and limits, but also performing the necessary care of ventilated patients. When the situation deteriorated or became too complex, the physician was called to the rescue and tried to adapt the settings. The development of new ventilator modes, the evolution of the mechanical ventilation concepts, and the realisation of the importance of involving the nurses in the weaning process all led to a more collaborative approach [30]. Nowadays, nurses and physicians work together around the patient and ventilator and share their knowledge, skills and experience, with an effect on outcome [10, 31, 32].

Continuous renal replacement therapies, extracorporeal techniques such as extracorporeal membrane oxygenation (ECMO), and also early mobilisation and nutrition are other complex interventions for which the development of collaborative teamwork in the ICU may significantly improve the outcome of ICU patients, although this remains to be demonstrated for most of them [33].

Eventually, end-of-life care and communication with the patients and families are "human" interventions that require a close collaboration of all the members of the ICU team, with a measurable positive effect [34]. Ethical round-table discussions and interprofessional opinion development allow collective decision making, which can be accepted by the whole team. This is an important condition for homogenous and harmonious verbal and nonverbal messages delivered by all members of team, in order to reduce the risk of incomprehension and triangulation with the patient and relatives. Only mature teams, very conscious of the paramount importance of this aspect, can be felt as a cohesive team by the patients. These competencies may be difficult to acquire collectively. Such simple approaches as regular joint communication session with the family, preferably in the presence of the patient, or the writing of a patient's dairies, shared by nurses, doctors, other team members and relatives, may be reinforce this maturation process.

In all these examples, it is interesting to see that simultaneous interprofessional training has become a key component of practical implementation. Simulation, whether low- or high-fidelity, is an important component of training, because it puts the working team in contact with reality without fear of consequences for the patient [35, 36]. In the future, it is highly probable that many frequent and complex clinical situations requiring technical procedures and high-intensity work will be simulated very precisely and will allow interprofessional teams to be better prepared to face these challenging conditions. But it should not be forgotten that the goal of better interprofessional work is to improve the outcome of the patients, and that this is not well demonstrated so far.

The Swiss Society of Intensive Care Medicine (SSICM): a successful interprofessional society?

The Society for Critical Care Medicine (SCCM) in the USA was one of the first medical societies to welcome nurses as regular members. The Swiss Society for Intensive Care Medicine (SGI-SSMI) was founded in 1972 as a physicians' organisation, but very early initiated close collaboration with nurses within a common working group that developed education and training of ICU nurses. The medical and nursing postgraduate trainings advanced in parallel and both tracks are now certified by the Swiss Federal State. The two professions decided to tighten their links and the Swiss Society for Intensive Care became an interprofessional organization in 2011. A lot of work was necessary to translate this wish of working together into

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a practically functioning society. As a witness of this successful development, the board and major working committees of the society, such as the certification commission of intensive care units (ZK-IS) [37] or the commission for congress [38] are joint interprofessional structures. In the educational field, both training commissions, which had to stay separate to cope with very different regulatory and legal frameworks, worked together to develop a recognition programme of continuous education for nurses, based on the system that has been used for physicians for years. Eventually, the corporate identity of the society became clearly oriented towards its interprofessional character. As recognition for this entire process, the SSICM was awarded in 2016 by the Swiss Academy of Medical Science for its interprofessional approach [39].

Even if the SSICM defines itself as interprofessional, this does not mean that interprofessionality is actually applied in the Swiss ICUs, and that this increases the quality of care. It is therefore expected that all Swiss ICUs will gradually apply the guiding principles of the charter for interprofessionality, and modify their daily clinical activity and the collaborative work of nurses and physicians, both in the educational programmes and in the everyday management of patients. Even though this may seem a top-down process, it is important to point out that the change of mentality at the level of the members of society is palpable and is reflected in many collaborative projects. Undoubtedly, the current process is in a development phase, sustained with the validation of innovative tools [40], and will possibly serve as an example for other professional societies.

Conclusions

The ICU is a complex universe, with high intensity of care and emotional stress, and may be an experimental environment to study and develop interprofessionality. With the critically ill patient at the centre, all members of the ICU team must learn how to work together, sharing common values and respecting the differences, in order to deliver the best of care, keeping an appropriate level of satisfaction among the member of the team. Nurses and physicians should not be opposed, but should combine their knowledge, their experience, and their competencies. This process should take place in the daily clinical practice and as much as possible in the training and teaching activities. Even if scientific data do not formally prove that interprofessionality is effectively improving the care of patients, common sense and indirect evidence are convincing enough to encourage the development of this collaborative process. The Swiss Society for Intensive Care Medicine is an interprofessional organiation, that encourages all ICU professionals to work together to deliver a high level of care for critically ill patients. The SSICM expressed in its 2020 profile the utmost importance of developing further the conditions for a successful interprofessional collaborative work among its members, and has consequently included the mandatory principle of interprofessionality in all its actual and future projects.

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References

1 Reeves S, Lewin S, Espin S, Zwarestein M. Interprofessional teamwork for health and social care. Wiley Blackwell: Oxford, UK; 2000.
2 Health Professions Education. A Bridge to Quality. Institute of Medicine (US) Committee on the Health Professions Education Summit; Greiner AC, Knebel E, editors. Washington (DC): National Academies Press (US); 2003.
3 Lockhart-Wood K. Collaboration between nurses and doctors in clinical practice. Br J Nurs. 2000;9(5):276–80. doi: http://dx.doi.org/10.12968/bjon.2000.9.5.6363. PubMed.
4 WHO. Framework for Action on Interprofessional Education and Collaborative Practice. 2010. http://whqlibdoc.who.int/hq/2010/WHO_HRH_HPN_10.3_eng.pdf?ua=1.
5 Charta «Zusammenarbeit der Fachleute im Gesundheitswesen» - SAMS 2014. http://www.samw.ch/dam/jcr:c5fd1ba0-03f4-4e7a-adaa-2ab50a56253b/charta_samw_zusammenarbeit.pdf.
6 Stein LI, Watts DT, Howell T. The doctor-nurse game revisited. N Engl J Med. 1990;322(8):546–9. doi: http://dx.doi.org/10.1056/NEJM199002223220810. PubMed.
7 Porter S. A participant observation study of power relations between nurses and doctors in a general hospital. J Adv Nurs. 1991;16(6):728–35. doi: http://dx.doi.org/10.1111/j.1365-2648.1991.tb01731.x. PubMed.
8 Gilmour J, Huntington A, Bogossian F, Leadbitter B, Turner C. Medical education and informal teaching by nurses and midwives. Int J Med Educ. 2014;5:173–7. doi: http://dx.doi.org/10.5116/ijme.53f5.ee77. PubMed.
9 Greenfield LJ. Doctors and nurses: a troubled partnership. Ann Surg. 1999;230(3):279–88. doi: http://dx.doi.org/10.1097/00000658-199909000-00001. PubMed.
10 Watters C, Reedy G, Ross A, Morgan NJ, Handslip R, Jaye P. Does interprofessional simulation increase self-efficacy: a comparative study. BMJ Open. 2015;5(1):e005472. doi: http://dx.doi.org/10.1136/bmjopen-2014-005472. PubMed.
11 Epstein NE. Multidisciplinary in-hospital teams improve patient outcomes: A review. Surg Neurol Int. 2014;5(8, Suppl 7):295–303. doi: http://dx.doi.org/10.4103/2152-7806.139612. PubMed.
12 Morey JC, Simon R, Jay GD, Wears RL, Salisbury M, Dukes KA, et al. Error reduction and performance improvement in the emergency department through formal teamwork training: evaluation results of the MedTeams project. Health Serv Res. 2002;37(6):1553–81. doi: http://dx.doi.org/10.1111/1475-6773.01104. PubMed.
13 Martin JS, Ummenhofer W, Manser T, Spirig R. Interprofessional collaboration among nurses and physicians: making a difference in patient outcome. Swiss Med Wkly. 2010;140:w13062. PubMed.
14 Reeves S, Pelone F, Harrison R, Goldman J, Zwarenstein M. Interprofessional collaboration to improve professional practice and healthcare outcomes. Cochrane Database Syst Rev. 2017;6(6):CD000072. doi: http://dx.doi.org/10.1002/14651858.CD000072.pub3. PubMed.
15 Yeager S. Interdisciplinary collaboration: the heart and soul of health care. Crit Care Nurs Clin North Am. 2005;17(2):143–8, x. doi: http://dx.doi.org/10.1016/j.ccell.2005.01.003. PubMed.
16 Chang WY, Ma JC, Chiu HT, Lin KC, Lee PH. Job satisfaction and perceptions of quality of patient care, collaboration and teamwork in acute care hospitals. J Adv Nurs. 2009;65(9):1946–55. doi: http://dx.doi.org/10.1111/j.1365-2648.2009.05085.x. PubMed.
17 Zhang L, Huang L, Liu M, Yan H, Li X. Nurse-physician collaboration impacts job satisfaction and turnover among nurses: A hospital-based cross-sectional study in Beijing. Int J Nurs Pract. 2016;22(3):284–90. doi: http://dx.doi.org/10.1111/ijn.12424. PubMed.
18 Donchin Y, Gopher D, Olin M, Badihi Y, Biesky M, Sprung CL, et al. A look into the nature and causes of human errors in the intensive care unit. Crit Care Med. 1995;23(2):294–300. doi: http://dx.doi.org/10.1097/00003246-199502000-00015. PubMed.
19 Manthous C, Nembhard IM, Hollingshead AB. Building effective critical care teams. Crit Care. 2011;15(4):307. doi: http://dx.doi.org/10.1186/cc10255. PubMed.
20 Hawryluck LA, Espin SL, Garwood KC, Evans CA, Lingard LA. Pulling together and pushing apart: tides of tension in the ICU team. Acad Med. 2002;77(10, Suppl):S73–6. doi: http://dx.doi.org/10.1097/00001888-200210001-00024. PubMed.
21 Lingard L, Espin S, Evans C, Hawryluck L. The rules of the game: interprofessional collaboration on the intensive care unit team. Crit Care. 2004;8(6):R403–8. doi: http://dx.doi.org/10.1186/cc2958. PubMed.
22 Nancarrow SA, Booth A, Ariss S, Smith T, Enderby P, Roots A. Ten principles of good interdisciplinary team work. Hum Resour Health. 2013;11(1):19. doi: http://dx.doi.org/10.1186/1478-4491-11-19. PubMed.

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23 Despins LA. Patient safety and collaboration of the intensive care unit team. Crit Care Nurse. 2009;29(2):85–91. doi: http://dx.doi.org/10.4037/ccn2009281. PubMed.

24 Reader TW, Flin R, Mearns K, Cuthbertson BH. Developing a team performance framework for the intensive care unit. Crit Care Med. 2009;37(5):1787–93. doi: http://dx.doi.org/10.1097/CCM.0b013e31819f0451. PubMed.

25 Dietz AS, Pronovost PJ, Mendez-Tellez PA, Wyskiel R, Marsteller JA, Thompson DA, et al. A systematic review of teamwork in the intensive care unit: what do we know about teamwork, team tasks, and improvement strategies? J Crit Care. 2014;29(6):908–14. doi: http://dx.doi.org/10.1016/j.jcrc.2014.05.025. PubMed.

26 Pronovost P, Berenholtz S, Dorman T, Lipsett PA, Simmonds T, Haraden C. Improving communication in the ICU using daily goals. J Crit Care. 2003;18(2):71–5. doi: http://dx.doi.org/10.1053/jcrc.2003.50008. PubMed.

27 Rothen HU, Stricker K, Einfalt J, Bauer P, Metnitz PG, Moreno RP, et al. Variability in outcome and resource use in intensive care units. Intensive Care Med. 2007;33(8):1329–36. doi: http://dx.doi.org/10.1007/s00134-007-0690-3. PubMed.

28 Kim MM, Barnato AE, Angus DC, Fleisher LA, Kahn JM. The effect of multidisciplinary care teams on intensive care unit mortality. Arch Intern Med. 2010;170(4):369–76. doi: http://dx.doi.org/10.1001/archinternmed.2009.521. PubMed.

29 Hunziker S, Johansson AC, Tschan F, Semmer NK, Rock L, Howell MD, et al. Teamwork and leadership in cardiopulmonary resuscitation. J Am Coll Cardiol. 2011;57(24):2381–8. doi: http://dx.doi.org/10.1016/j.jacc.2011.03.017. PubMed.

30 Piquette D, Reeves S, Leblanc VR. Interprofessional intensive care unit team interactions and medical crises: a qualitative study. J Interprof Care. 2009;23(3):273–85. doi: http://dx.doi.org/10.1080/13561820802697818. PubMed.

31 Blackwood B, Alderdice F, Burns KE, Cardwell CR, Lavery G, O'Halloran P. Protocolized versus non-protocolized weaning for reducing the duration of mechanical ventilation in critically ill adult patients. Cochrane Database Syst Rev. 2010;(5):CD006904. doi: http://dx.doi.org/10.1002/14651858.CD006904. PubMed.

32 Bloos F, Müller S, Harz A, Gugel M, Geil D, Egerland K, et al. Effects of staff training on the care of mechanically ventilated patients: a prospective cohort study. Br J Anaesth. 2009;103(2):232–7. doi: http://dx.doi.org/10.1093/bja/aep114. PubMed.

33 Hickmann CE, Castanares-Zapatero D, Bialais E, Dugernier J, Tordeur A, Colmant L, et al. Teamwork enables high level of early mobilization in critically ill patients. Ann Intensive Care. 2016;6(1):80. Published online August 24, 2016. doi: http://dx.doi.org/10.1186/s13613-016-0184-y. PubMed.

34 Curtis JR, Ciechanowski PS, Downey L, Gold J, Nielsen EL, Shannon SE, et al. Development and evaluation of an interprofessional communication intervention to improve family outcomes in the ICU. Contemp Clin Trials. 2012;33(6):1245–54. doi: http://dx.doi.org/10.1016/j.cct.2012.06.010. PubMed.

35 Frengley RW, Weller JM, Torrie J, Dzendrowskyj P, Yee B, Paul AM, et al. The effect of a simulation-based training intervention on the performance of established critical care unit teams. Crit Care Med. 2011;39(12):2605–11. doi: http://dx.doi.org/10.1097/CCM.0b013e3182282a98. PubMed.

36 Steadman RH, Coates WC, Huang YM, Matevosian R, Larmon BR, McCullough L, et al. Simulation-based training is superior to problem-based learning for the acquisition of critical assessment and management skills. Crit Care Med. 2006;34(1):151–7. doi: http://dx.doi.org/10.1097/01.CCM.0000190619.42013.94. PubMed.

37 https://www.swiss-icu-cert.ch/de/Zertifikation.html

38 http://www.sgi-ssmi.ch/index.php/kongresskommission.html

39 http://www.samw.ch/de/Projekte/Interprofessionalitaet/Award.html.

40 Schärli M, Müller R, Martin JS, Spichiger E, Spirig R. Interprofessionelle Zusammenarbeit Pflegefachpersonen und Ärzteschaft - Eine Triangulation quantitativer und qualitativer Daten. Pflege. 2017;30:53–6. doi: http://dx.doi.org/10.1024/1012-5302/a000531.

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