5 INTRODUCTION TO CARDIOPULMONARY RESUSCITATION IN VIRTUAL REALITY (VR) ACTIONS THAT SAVE

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CONTEXT

Cardiac arrest is defined by a sudden simultaneous interruption of the circulation and respiration, most often (more than 80% of patients **[1]**) caused by a major cardiac arrhythmia called ventricular fibrillation. According to the «Fondation Suisse de Cardiologie» and quoting from the "Concept of First Responders in the Canton Fribourg", the incidence of sudden cardiac death in Switzerland is in the range of 0.4 to 1 per 1000 inhabitants per year, which corresponds to around 8000 individuals per year throughout the entire country. This type of cardiac cardiac arrest offers, however, extremely good chances of survival and an excellent neurological prognosis, provided that the victim is supported as rapidly as possible by the application of several measures included in the concept of the chain of survival:

- Recognition of cardiac arrest and alerting emergency services
- Early cardiac massage (Basic Life Support - BLS)
- Early defibrillation (Automated External Defibrillation - AED)
- Advanced Professional Care (Advanced Cardiac Life Support - ACLS)

"In Switzerland the survival rate of cardiac arrest is estimated at 5-10% but this figure may vary according to predictive factors of a good prognosis.." **[1]** Cardiac arrest is thus a vital emergency needing to be dealt with extremely rapidly by the first witness of the situation (First Responder). After five minutes, if no measures are undertaken, the person will suffer severe or even permanent brain lesions, while after six minutes death is inevitable.

PROJECT

In partnership with Wanadev **[2]**, a company specialising, I offer to introduce a wide audience to cardiopulmonary resuscitation, through a brief scenario of five to seven minutes, thanks to YouRescue® a high-tech device using virtual reality (VR) **[3]**. Each participant will be placed in complete immersion in an ultra-realistic scenario where he/she will be both actor and rescuer. The learner will be immersed in an emergency situation where he/she discovers a corporate lobby and sees two people having a discussion. A few moments later one of them collapses on the ground, victim of a cardiac arrest.

There follows a specific procedure which consists in stimulating the victim so as to verify his/her level of consciousness and, in VR coordination with the witness, alerting the emergency services, confirming the emergency number and the address of the premises and then rapidly beginning external cardiac massage (ECM). The defibrillator is brought on by the witness a few moments later. The patches must be placed on the thorax of the victim and then the order issued by the device must be followed, ie trigger the electrical defibrillation and then resume ECM. In a second phase the device is closely linked to a workshop conducted by an SRC **[4]** certified instructor and intended to hone cardiac massage skills, answer questions and/or orientate the learner to a more advanced training course.

FEEDBACK FROM EARLY EXPERIENCES

At the present stage of development the VR interface and the dummy of the victim are in their infancy. Haptic feedback in this context needs to be developed and refined. Around twenty non-medical professionals tested the system and declared themselves impressed, excited, with a real feeling of being

at the heart of a situation which makes sense and shows the importance of the actions to be learnt and carried out. In spite of some remaining questions, the initial tests proved conclusive and the first BLS-AED training sessions using VR as an introduction should start soon.

EXPERIENTIAL LEARNING

By means of this project my first intention is to remove negative assumptions, fears or taboos related to the actions of resuscitation among individuals, organizations and employees. This will raise awareness that the first cardiopulmonary resuscitation measures are not merely important but vital while awaiting the arrival of professional services. The innovative, original and powerful tool with its aspect of play will, through total immersion, facilitate the safe and efficient learning of actions that save. Thus the chances of survival of the victim before the arrival of the emergency services will increase considerably. I intend to strengthen the VR concept in terms of the original target audience, but also to expand it by addressing, for example, specific professionals in the field of health (paramedics, nurses, etc.) or those in professions at risk such as firefighters, police, etc. according to the needs of all those involved.

CONCLUSION

I am convinced that the development of andragogical principles (5*) needs to proceed via the improvement or indeed emergence of new pedagogical tools. Virtual Reality (VR) seems to me to represent a future vehicle in the field of health training. This serious game concerns a potentially large number of individuals in all socioprofessional categories.

REFERENCES

[1] Concept des premiers répondants ("First Responders") du canton de Fribourg, Direction de la santé et des affaires sociales DSAS, 14 septembre 2016 - Fondation Suisse de cardiologie, rapport annuel 2016

[2] Wanadev, https://www.wanadev.fr/

[3] Wanadev, https://www.wanadev.fr/yourescue

[4] SRC : Swiss Resuscitation Council : conseil Suisse de réanimation qui certifie les formations BLS - AED dispensées

[5] http://andragogies-formations.over-blog.com/pages/L_ANDRAGOGIE_cest_quoi-6503995.html