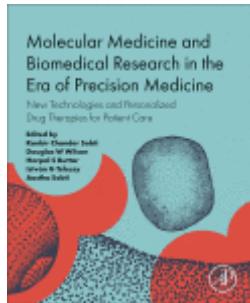


Molecular Medicine and Biomedical Research in the Era of Precision Medicine

New Technologies and Personalized Drug Therapies for Patient Care

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Chapter 21 –

Applications of innovative biomedical technologies for healthy ageing: Strategies for improving patient care and reducing healthcare costs in elderly populations

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Abstract

This review summarizes the long clinical applications journey which became successful with the support of innovative biomedical and communications technologies developed for the purpose of fighting isolation and promoting healthy ageing. The PACE 2000 International Foundation (Programs for Autonomy and Communication for the Elderly) was created in 1992, in the context of an ageing demographics and the digital Information Communications Technologies (ICT) revolution, and to address the issue of increasing isolated seniors, be it in their homes or in long-term care facilities. At a time when isolation had not yet been clearly identified as a precipitating factor for dependency, some success had been achieved by high school and college students participating in interactive intergenerational services provision in nursing homes.

Subsequently, in 1996, a tentative solution to the problem of senior's isolation was developed by PACE 2000 consisting of the customisation of existing videoconferencing technologies. The customisation innovations were employed to meet the threefold challenges of; 1. Can Information Communication Technologies (ICT) promote human relationships? 2. Will customised videoconference become attractive to seniors with little or no technological expertise? 3. Can customised videoconferencing overcome some of the barriers such as the sense of a lack of agency or the sense of passive participation often

encountered in face-to-face meetings as experienced in traditional mentoring programmes and medical consultations?

The results of this initiative exceeded expectations, as it resolved all three challenges and, when combined with intergenerational programs for pairs of trainer-trained participants, provided unexpected outcomes for both generations as demonstrated by our own data, in particular participants' multiple testimonials: rapid behavioural changes, self-motivation, empathy, self-confidence, increased tolerance, enjoyable [learning experiences](#) and planning conditions, a feeling of usefulness, and improved mobility in frail seniors as measured by the Videoconference Based [Goniometer](#) (VCBG).

Notably even at the biological gene level, the shrinking DNA-telomeres, a phenomenon related to ageing, and increases in senescent cells in the body which are also related to ageing, are linked to the lack of [social life](#) and increased isolation.

In conclusion, our results suggest that fighting the isolation of seniors can be aided by the use of innovative biomedical technologies in the context of intergenerational programs. The use of inexpensive ICT mediated prevention of dependency innovations, should warrant rapid and large-scale distributions, thereby promoting longevity in good health in parallel with significant healthcare costs savings.