PPPM Innovation in Primary, Secondary and Tertiary Care

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1 Health-to-Disease Transition in Focus of Advanced Bio/Medical Sciences and Healthcare Services

Reactive medicine has reached its ethical, economic and technological limits as demonstrated by pandemic spread of acute infections such as COVID-19 [1–3] as well as pandemics of chronic disorders. To this end, currently, more than half of billion patients are diagnosed with diabetes type 2, over 70 million of glaucoma

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patients are predisposed to blindness, breast and prostate cancers together reached a pandemic scale, whereby prostate cancer management costs increase more rapidly than for any other cancer [4–7]. Therefore, the paradigm change promoted by the European Association for Predictive, Preventive and Personalised Medicine (EPMA, Brussels, www.epmanet.eu), namely from reactive medical services to predictive approach, cost-effective targeted prevention and personalisation of treatment algorithms is essential to advance healthcare, to increase life quality of population and to improve health economy in a short- and long-term way [8–10].

In a long-term manner, the most cost-effective strategy is to focus scientific and healthcare effort on the health-to-disease transition, in order to the reverse current pandemic trends [11]. Internationally accumulated knowledge about sub-optimal health conditions is of pivotal importance to apply PPPM strategies protecting affected population against health adverse effects of internal and external risk factors. Health risk assessment and cost-effective targeted prevention is detailed in this book and can be well exemplified by sub-optimal health of individuals with the Flammer syndrome phenotype [12] amongst others.

2 A Holistic Approach by 3P Medicine Is the Clue

Systemic effects are characteristic for sub-optimal health conditions, transition from health-to-diseases as well as progression of multi-factorial disorders such as metabolic syndrome, malignancies and neurodegenerative processes. Therefore, a holistic approach by 3P medicine is the clue in disease prediction, prevention and treatment. To this end, mitochondrial health is considered instrumental to monitor stability of the health condition, to detect systemic reactions towards multi-factorial stressors and to assess adequacy of the stress response towards environmental changes, redox balance, the innate and acquired immunity as well as severity of the acute and chronic disorders. Well-known mitochondrial burnout-associated pathologies include chronic fatigue, accelerated ageing, auto/immune disorders, hormonal dysregulation and infertility, eye pathologies, metabolic and mood disorders, severe respiratory diseases, impaired healing, neurodegenerative and cancerous alterations [13]. Contextually, mitochondrial health quality control is considered in the book for the holistic predictive diagnostic approach in PPPM framework.

3 Technological Innovation

Health protection, life quality and robustness of diagnostic and treatment approaches are the main criteria of quality considered in the framework of the PPPM-relevant technological developments. Consequently, non-invasive, user-friendly, reliable and cost-effective diagnostic approaches, PPPM-relevant products and medical services are highly prioritised. Technological solutions adapted to these criteria are detailed in the book such as diagnostic approaches utilising tear fluid as the non-invasive source of biomarkers specific for ocular and systemic diseases [14], telemedical

approach utilising wearable sensors for permanent monitoring individuals at risk and in chronic medical conditions, and application of artificial intelligence, amongst others.

4 Conclusion

In conclusion, the **anticipated progress beyond the state of the art in primary, secondary and tertiary care**, and PPPM benefits are summarised below:

- Primary healthcare.
  - Whole-body health quality check-up.
  - Pre-pregnancy check-up.
  - Accompanying diagnostics in sport medicine and supervised physical activities.
  - Accompanying diagnostics in physiotherapeutic and well-being services.
  - Health-to-disease transition check-up and targeted protection amongst others.
- Secondary healthcare.
  - Early-stage disease detection and targeted prevention of the disease progression.
  - Treatment algorithms tailored to the individualised multi-parametric patient profile.
  - Therapy efficacy monitoring and improved individual outcomes.

The accents will get shifted towards stabilised medical conditions.

- Tertiary healthcare.
- In the tertiary healthcare the accents will get shifted from palliative care to the care of chronic medical conditions with significantly improved life quality of patients under treatment.

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