

A P5 cancer medicine approach: why personalized medicine cannot ignore psychology

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Abstract

A system approach termed P4 medicine has recently been proposed in the field of oncology. This approach has been advanced as an extension of what is usually called 'personalized' or 'genomic medicine'. P4 medicine creates effective *predictive, personalized, preventive* and *participatory* models to treat patients. In order to give more relevance to the behavioural component that impinges on the way individuals act to prevent, cope and react to illnesses, how they decide between different therapeutic options and interact with physicians and adhere to treatment, we propose that P4 medicine should be transformed into P5 medicine. The fifth P represents the *psycho-cognitive* aspects to be considered in order to empower the patient, increase his/her quality of life and transform him/her from a passive recipient into an active decision-maker in the treatment process.

Introduction

More than 5 years ago, Leroy Hood [1,2] proposed a system approach called 'P4 medicine', considered to be a sophisticated extension of what is usually called 'personalized' or 'genomic medicine'. The four Ps refer to the *predictive, personalized, preventive* and *participatory* aspects of clinical medicine [3,4]. As recently suggested by L. Hood and S. Friend [5] the implementation of P4 medicine in a clinical approach will create successful predictive and actionable models for use in the care of patients, by drawing on to the combination of different data obtained from a variety of levels of biological information. These personalized models represent each patient's wellness or disease continuum that allows the design of new pharmacological trials taking into account the heterogeneity of responses to therapies and disease stratification. Using the new and powerful diagnostic, therapeutic and IT (information technology) tools available, new insights predicting the future clinical needs for each individual patient will be provided. Finally, the P4 approach can develop biomarker registries in order to increase their accessibility by the entire scientific community and avoid selective publication biases. According to Hood and Friend, this approach has the potential to be useful not only in improving clinical practice, but also in making patients more actively involved in experimental trials, changing medicine 'from a reactive to a proactive discipline'.

The P5 approach

From a biological point of view, the P4 approach represents a visionary advance in medicine, and a marker of real progress when compared to the more traditional personalized medicine perspective. Thus, considering each individual/patient as a whole, the P4 approach fails to consider a very important aspect that contributes the uniqueness of the individual: the psychological component that makes each of us different from others. Due to the undeniable importance of this factor in everyday life as well as in the way in which patients react to their illnesses, decide about treatments and interact with health care providers, we have recently proposed to transform P4 medicine into P5 medicine [6]. The fifth P refers to the *psycho-cognitive* aspects that must be considered in order to define a personal profile of the patient that is not only a biological and genetic entity, but also to recognize the patient as a person with specific needs and values, habits and behaviours, hopes and fears, beliefs and cognitive dispositions. A proper consideration of all of these aspects and an integration of them with biological and genetic information is necessary to empower the patient, increase his/her quality of life and transform him/her from a passive recipient into an active decision-maker as part of the treatment process (Fig. 1). In common with P4 medicine, P5 medicine is aimed at maximizing wellness for each individual, shifting the focus from disease to an emphasis on wellness and emphasizing the

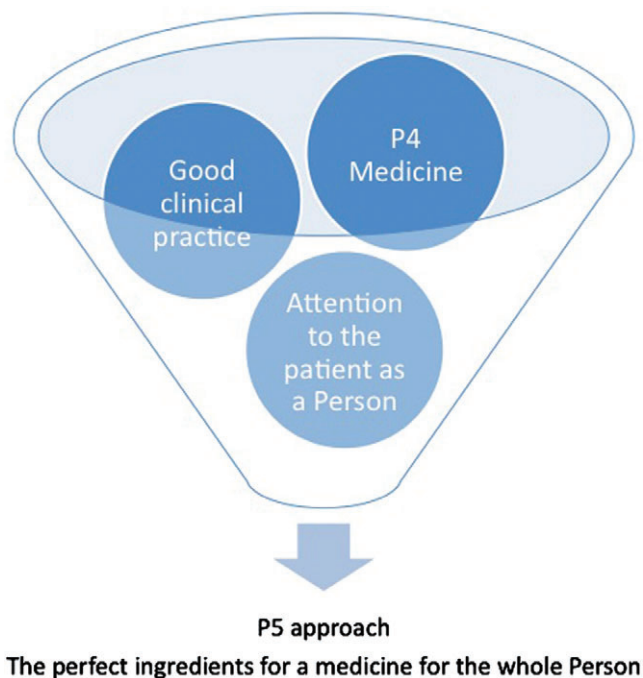


Figure 1 A schematic representation of the main components necessary for a Medicine for the Whole Person.

psychological and cognitive aspects of health, not simply the medical ones. Promoting a person-centred, relationship-based model of care, the P5 approach requires the development and validation of new psychometric instruments to create a psychological and cognitive profile of the patient that, given to physicians, will help them find the best and most efficient strategy to communicate with the patient, to understand his/her needs and expectations and involve the patient in the therapeutic decision-making process. At the same time, patients should be clearly informed not only about their diagnosis, but also about all of the available therapeutic options. This information could be provided directly from health care providers and/or from informative and reliable materials so that patients have the resources necessary to enable them to participate in the decision-making process with their physicians. Similarly, patients should be invited to decide what kind of research they are happy to consent to their data and biomaterial, being used for, for the sake of greater transparency in the health care system. Additionally, they should be asked in which experimental trials (if any) they want to be included. With regard to what was stated in a pivotal court case: 'Every human being of adult years and sound mind has a right to determine what shall be done with his own body' [7], patients must be free to decide about their medical care, weighing the benefits, risks and alternatives of proposed interventions to ensure that the care they receive reflects their goals, wishes, beliefs, preferences and values. In order to achieve this aim, clinicians should be able not only to diagnose and treat the patient, but also to develop an empathic relationship with him/her that transforms the clinical encounter as part of the clinical relationship. Through this process the patient will be recognized as a person and not only as a clinical case or a statistical unit. At the same time, the dynamic interaction between physician and patient

will facilitate the choice of the 'optimal' therapy that will take into account the psychological information collected, as well as purely medical data.

Another crucial characteristic of the P5 approach is the need to assess the quality of life and the satisfaction with care of oncologic patients. In recent times, cancer frequently becomes a chronic disease, a direct result of modern therapeutic interventions. However, in addition to extending life, these treatments often produce numerous side effects and/or lifestyle limitations. These effects must be investigated and discussed with the patient, especially when the illness enters into a chronic phase so that, once again, the patient is called actively to participate in the clinical process, being free to express a personal opinion about the treatment plan and the predicted outcomes. Studies conducted to date [8,9] show that the involvement of the patient in clinical decisions (through what we can call the 'personalized therapeutic plan'), taking into account all the psychological and personal variables discussed above, is a strong way to preserve or even improve quality of life. Maintaining a good quality of life, especially in the chronic phase of the disease, helps increase the patient's vitality and social functioning and can reduce the incidence of depression and anxiety [10,11]. These approaches also offer a better therapeutic adherence and a longer life expectation, by improving the patient's abilities to deal with his/her illness and to preserve his/her capacity to conduct an active life.

Finally, the P5 approach should be applied also to prevention plans aimed at reducing oncological incidence. An effective prevention and health promoting strategy requires a proper consideration of the psychological factors that guide human (unhealthy) behaviours in order to identify a mechanism(s) to change them. Clear communication between individuals and health care providers and the use of cognitive and emotional strategies that modify the erroneous beliefs underlining risky and unhealthy behaviours should be promoted and delivered at all stages of life (from childhood to old age).

Conclusions

To give more relevance to the behavioural component that influences on the way individuals act to prevent, cope and react to them illnesses, decide between different therapeutic options and interact with physicians and adhere to treatment, we have proposed a transformation of P4 medicine into P5 medicine. The fifth P represents the psycho-cognitive aspects to be considered in order to empower the patient, increase his/her quality of life and transform him/her from a passive recipient into an active participant in the treatment process. This approach derives from the need to develop a higher level of personalization of clinical services than that which currently exists. This change is necessary for different reasons. First, in order to tailor treatment for the patient, he/she must be considered not only at organic and technical level, but also at psychological, cognitive, emotional and social levels. This optimizes clinical outcomes as well creating a partnership of patient and clinician and increasing their respective satisfaction with care. Each person, healthy or sick, has his/her personal life project and medicine has the duty (or the imperative) to understand it and respect it.

Moreover, clinical contexts that consider the fifth P encourage the shared decision-making process. Today, patients have access to a

wealth (right or wrong) of medical information and this has changed, irreversibly, the paternalistic approach in which the doctor made decisions without considering the needs of the patient.

Put together, these considerations suggest how the introduction of the fifth P could have a great impact on the empowerment process: providing information about the disease, participating in the clinical decision-making process, and creating a constructive relationship with the health care providers. These are just some of the steps that increase patients' self-efficacy. A strong sense of self-efficacy can reduce disease symptoms and helps bring about self-directed behaviour changes that favour the process of healing and increase patients' quality of life. Moreover, a medical approach that gives more attention to the patient as a person, attending to his/her social and cultural context and recognizing the role of family and friends fulfils the original mission of medicine: that medicine exists not only aimed to cure patients, but also to care for them [12].

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References

1. Weston, A. D. & Hood, L. (2004) Systems biology, proteomics, and the future of health care: toward predictive, preventative, and personalized medicine. *Journal of Proteome Research*, 3, 179–196.
2. Hood, L. (2008) A systems approach to medicine will transform healthcare. In *Physical Biology: From Atoms to Medicine* (ed. A. H. Zewall), pp. 337–366. London: Imperial College Press.
3. Auffray, C., Charron, D. & Hood, L. (2010) Predictive, preventive, personalized and participatory medicine: back to the future. *Genome Medicine*, 2, 57.
4. Price, N. D., Edelman, L. B., Lee, I., Yoo, H., Hwang, D., Carlson, G., Galas, D. J., Heath, J. R. & Hood, L. (2009) Systems biology and systems medicine. In *Essentials of Genomic and Personalized Medicine* (eds G. S. Ginsburg & H. F. Willard), pp. 131–141. Maryland Heights: Elsevier Academic Press.
5. Hood, L. & Friend, S. H. (2011) Predictive, personalized, preventive, participatory (P4) cancer medicine. *Nature Reviews Clinical Oncology*, 8, 184–187.
6. Gorini, A. & Pravettoni, G. (2011) P5 medicine: a plus for a personalized approach to oncology. *Nature Reviews Clinical Oncology*. doi: 10.1038/nrclinonc.2010.227-c1.
7. Schloendorff Society of New York Hospital. 92 N, editor. New York 1914.
8. Hewitt, M. & Simone, J. V. (1999) Ensuring Quality Cancer Care (ed. National Cancer Policy Board IoMRaNRc). Washington, DC: National Academy Press.
9. Leo, F., Radice, D., Didier, F., Carvalho, F. B., Spacca, E., Madini, M., Esposito, C., Agnello, M., Meneghin, S. & Spaggiari, L. (2009) Does a personalized approach improve patient satisfaction in thoracic oncology? *American Journal of Managed Care*, 15 (6), 361–367.
10. Bruera, E., Sweeney, C., Calder, K., Palmer, L. & Benisch-Tolley, S. (2001) Patient preferences versus physician perceptions of treatment decisions in cancer care. *Journal of Clinical Oncology*, 19 (11), 2883–2885.
11. Whelan, T. J. & Loprinzi, C. (2005) Physician/patient decision aids for adjuvant therapy. *Journal of Clinical Oncology*, 23, 1627–1630.
12. Miles, A. (2009) On a Medicine of the Whole Person: away from scientific reductionism and towards the embrace of the complex in clinical practice. *Journal of Evaluation in Clinical Practice*, 15 (6), 941–949.