



## Working around a patient, core concept of the patient-centered care with a focus on diabetes mellitus and associated chronic wounds; A review

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### Abstract

Management of chronic diseases is a challenging task in current medical practice and treatment of such conditions and their complications is not very straight forward as we deal with multiple clinical problems. This review article provides an overview of the core concept of patient-centered care, effects of diabetes mellitus (DM) on wound healing, and implication of the multidisciplinary team concept for such patients. The literature was searched using “wounds”, “chronic wound healing”, “multidisciplinary team and chronic wound healing” and “patient-centered care and wound healing” as keywords on PubMed as the main source of search. Every chronic disease can involve many health professionals at various stages. The patient-centered approach is a concept that is proving beneficial clinically. This concept considers patient as a center of the circle, and every facility is connected and based upon the patient’s needs. In this article, we have briefly explained implication of such multidisciplinary teams by considering DM management, with a focus on chronic wounds. DM is one of the systemic diseases which puts a significant financial as well as health quality related burden on health systems worldwide. Out of these complications, diabetic foot ulcers (DFUs) and effects of DM on wound healing are extremely important. This clinically important concept of making “teams” to manage various chronic diseases should be investigated in various clinical settings. The data from further research should be analysed to standardize this globally for different categories of wound patients.

**KEYWORDS:** Chronic Diseases; Diabetes Mellitus; Wounds; Multidisciplinary Research; Patient-Centered Care

### Review Article

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### Introduction

Chronic ailments are becoming common and their management usually requires engagement of multiple health disciplines. For instance, chronic wounds are associated with numerous disturbances not only at biochemical, but also at psychological level, which results in multiple problems such as disability, pain, stress, and social issues.<sup>1-3</sup>

As we deal with multiple clinical challenges in such ailments, the involvement of multiple

health departments is usually required. For example, general physicians and nurses are usually involved in care of most of the patients, but some patients may also require physiotherapy, social support, and/or a nutritionist.<sup>1-4</sup>

This review article was extracted from the literature reviewed and based on a clinical project focusing on bacterial load, bacterial diversity, virulence genes, biofilm genes, and clinical wound management. Out of more than 500 articles reviewed for both projects, about 60 articles (review and research) were filtered and read for generating relevant information for this article. The final literature search was

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carried out in early 2020 and no time limit was set for the search process.

### Concept, importance, and problems for multidisciplinary team

Professionals from multiple disciplines working together to treat a patient are usually referred to as a “team”, as they all use and combine their individual skills to achieve a final clinical outcome.<sup>5,6</sup> This type of cooperation is defined as “a dynamic process involving two or more healthcare professionals with complementary backgrounds and skills, sharing common health goals, and exercising concerted, physical, and mental effort in assessing, planning, or evaluating patient care”.<sup>7</sup> Community of practice (CoP) is another important but related term. This refers to a group of health care workers who are having closeness in their clinical goals and share knowledge and expertise.<sup>8</sup>

These professionals need to develop certain qualities to produce effective results. Tallia et al. have described a number of essential elements for a successful team such as trust and respect. It should also be noted that different individuals have different levels of knowledge, experience, and skill.<sup>9</sup> Harris et al.<sup>5</sup> conducted a study evaluating almost the same criteria as the ones examined by Tallia et al.<sup>9</sup> and agreed to the proposed main qualities for a successful team. In addition, they emphasized the importance of defining roles for the individuals in a team.<sup>5,9</sup> The proper communication is also an important characteristic of a team.<sup>9</sup> It is also essential to increase knowledge, awareness, and skills of individuals in a group. This could not be achieved by just attending training or educational program, but a subsequent knowledge testing and real world implementation is required. This is the main focus of continuous professional development (CPD).<sup>1</sup>

It should be considered that it is not a simple process to form a multidisciplinary team.<sup>10</sup> Establishing a team is a complex

process. This is not just working of different staff members together, rather this is a process of sharing knowledge and expertise to achieve an effective treatment plan with full support and collaboration amongst members.<sup>11</sup> Furthermore, bringing a group of professionals together is a long process.<sup>1</sup> It is very important to maintain an inter-professional and/or a trans-professional team by respecting everyone’s abilities and knowledge. For example, if someone starts adapting the role of another person, then problems such as financial concerns can arise.<sup>1</sup> Professional competition involving financial interests is an important factor determining the success of a team. For instance, the Australian government has introduced the “Medicare” system to pay incentives or to compensate for the financial goals. This is a good practical example of tackling such financial issues.<sup>12</sup> Furthermore, there is a need to improve available resources and facilities for health care professionals. The World Health Organization (WHO) has stressed the problem of lack of clinical facilities, particularly in developing countries.<sup>13</sup>

### Patient-centered care and patient education

The main purpose of forming such a multidisciplinary group is to work for the betterment of a patient. This gives rise to another important concept of the “patient-centered” care. An ideal patient-centered care plan includes involvement of the person’s circle of care and an inter-professional health care team. The circle of care mainly includes the patient, caregivers, spouse, other family members, friends, and those who are interested in the improvement of the patient. On the other hand, an inter-professional team would include various health workers, depending on the patient’s condition. By adopting collaboration amongst all or most of these people, the treatment outcomes could be improved.<sup>1-14</sup> The patient should be considered

as the most important member of the team and should be involved in final decision making at all stages of treatment.<sup>5</sup>

The members for an ideal team for a particular patient would be based on the patient's concerns and requirements. Pain, family life, finance, social interactions, job, depression, sleep, and disability are some examples of such needs. It is only after the identification of the patient's requirements that a team could be formed. If there is lack of assessment of the main concerns and needs for a patient, we must expect a decrease in the level of compliance. Compliance has been defined as "the act or process of obeying an order or command."<sup>1</sup> Education and understanding of the patient and his/her caregivers is also important but challenging. It is necessary to educate patients and their caregivers about the care of patients at home. For instance, when dealing with surgical wounds, they should be taught to identify and report symptoms which could potentially indicate infection.<sup>15,16</sup>

Basic understanding of the healing process is very important for patients. By knowing general signs and symptoms of non-healing, the patients can seek medical help timely, hence avoiding many complications. For instance, they should be taught to identify and report symptoms which could potentially indicate infection.<sup>15</sup> Likewise, when we talk about DM in general, the patients are recommended to increase their understanding about their disease. They need to know the reason of their disease, complications

associated with it, and value of the treatment. It is recommended to inform and educate them about DM, its complications, glycaemic control, foot hygiene, footwear, and restriction of activities if required.<sup>17-18</sup> In an author's own clinical experience of the regular follow-up (at clinic or home visits), the detailed description of the patient's concerns to the doctor or nurses and provision of printed material related to their condition help patients a lot.

### DM, chronic wounds, and implication of patient-centered care

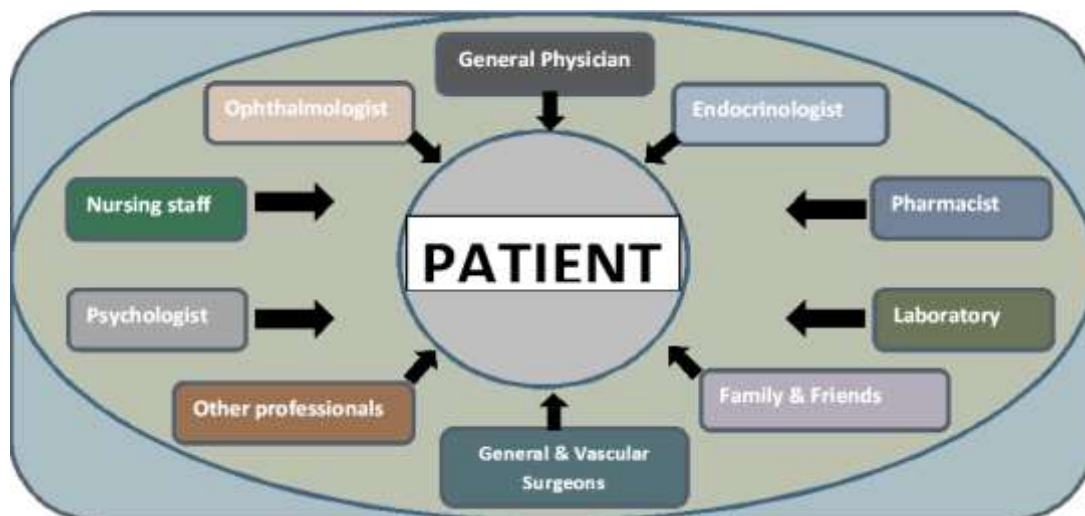
DM is an important disease, particularly due to its complications such as ulcer development.<sup>17</sup> These ulcers are formed as a result of damage to skin layers and are complicated by deranged immune response in DM.<sup>19</sup> Overall, patients with DM have a 15%-25% foot ulcer development risk.<sup>17</sup> This also poses a risk of amputations in these patients due to the development of chronic non-healing wounds.<sup>20,21</sup> DM impairs the healing process by multiple mechanisms such as depression of the immune system, microvascular complications of DM, ineffective angiogenesis, improper collagen laying, and re-epithelialization.<sup>22-24</sup> These wounds are also complicated with bacterial colonization from multiple organisms.<sup>25</sup> Table 1 below lists the important mechanisms affecting wound healing in patients with DM.<sup>22</sup>

DM increases the risk of wound development. Furthermore, it hinders the healing process, resulting in the formation of chronic wounds.

**Table 1. List of the mechanisms in diabetes mellitus (DM) affecting wound healing**

Mechanisms in DM	Affecting wound healing
Hyperglycaemia	Keratinocyte dysfunction
Hypoxia	Fibroblast dysfunction
Increased level of ROS (reactive oxygen species)	Impaired angiogenesis
AGEs (advanced glycation end-products)	Impaired Neovascularization
High MMPs (matrix metalloproteases)	Neuropathy
Hyperglycaemia	Decreased immunity
Hypoxia	Keratinocyte dysfunction

DM: Diabetes mellitus



**Figure 1. The main concept of patient-centered care involving a multidisciplinary team**

The wounds which do not heal by eight weeks are categorized as “chronic non-healing” wounds.<sup>21</sup> These wounds can result in numerous problems such as disability, pain, stress, financial burden, job related difficulties, failure to perform daily activities, impaired sense of smell, failure in social life, and overall, low quality of life (QOL) for the patients and their caregivers. It could be understood that such patients would require the involvement of a range of health professionals such as general physicians, nursing staff, endocrinologist, surgeons, and other professionals needed for the patient. The concept of the patient-centered care and multidisciplinary team is important in managing these patients. Figure 1 below depicts the main concept of patient-centered care;

### Conclusion

Every patient needs different level and type of care. This is the base for the concept and the purpose of an inter-professional team. Each patient should be assessed separately and his or her treatment plan should be designed. Although forming and working in multidisciplinary teams is challenging, it has important implications, particularly in managing chronic diseases. DM results in multiple health related problems and a

multidisciplinary team is usually required for its management. The formation of such teams for various chronic diseases needs standardization and global recommendations.

### Conflict of Interests

Authors have no conflict of interests.

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