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## Matter for Debate

## Integrative medicine or infiltrative pseudoscience?

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## ABSTRACT

Evidence-based medicine, first described in 1992, offers a clear, systematic, and scientific approach to the practice of medicine. Recently, the non-evidence-based practice of complementary and alternative medicine (CAM) has been increasing in the United States and around the world, particularly at medical institutions known for providing rigorous evidence-based care. The use of CAM may cause harm to patients through interactions with evidence-based medications or if patients choose to forego evidence-based care. CAM may also put financial strain on patients as most CAM expenditures are paid out-of-pocket. Despite these drawbacks, patients continue to use CAM due to media promotion of CAM therapies, dissatisfaction with conventional healthcare, and a desire for more holistic care. Given the increasing demand for CAM, many medical institutions now offer CAM services. Recently, there has been controversy surrounding the leaders of several CAM centres based at a highly respected academic medical institution, as they publicly expressed anti-vaccination views. These controversies demonstrate the non-evidence-based philosophies that run deep within CAM that are contrary to the evidence-based care that academic medical institutions should provide. Although there are financial incentives for institutions to provide CAM, it is important to recognize that this legitimizes CAM and may cause harm to patients. The poor regulation of CAM allows for the continued distribution of products and services that have not been rigorously tested for safety and efficacy. Governments in Australia and England have successfully improved regulation of CAM and can serve as a model to other countries.

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## Introduction

In 1992, Dr. Gordon Guyatt introduced the concept of evidence-based medicine, defined as the “conscientious, explicit, and judicious use of current best evidence in making

decisions about the care of individual patients”.<sup>1</sup> Prior to this, treatment decisions were based on clinical expertise and experience with little consideration of scientific evidence, leading to significant variations in decision making.<sup>2</sup> Health care professionals began to realize the merits of consistently incorporating evidence into clinical decision making and

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became increasingly appreciative of the concept.<sup>2</sup> Today, evidence-based medicine offers a clear, systematic, and scientific approach to the practice of medicine.<sup>3</sup> It is taught to health care professionals at every level of training and is the gold standard for how we provide care to patients today.<sup>4</sup>

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### Non-evidence-based medicine

Complementary and alternative medicine (CAM) describes health care approaches developed outside of evidence-based medicine.<sup>5</sup> Alternative medicine is used in place of evidence-based medicine, whereas complementary medicine is used in conjunction with evidence-based medicine.<sup>5</sup> Most people use CAM along with conventional medicine, but some choose to forego evidence-based care.<sup>6</sup> Terms such as integrative and functional medicine are increasingly used to depict a “holistic” approach to medicine, but they are similar to CAM and are not supported by scientific evidence.<sup>5,7</sup> These practices include visits to naturopathic, homeopathic, and chiropractic clinicians, herbal remedies, acupuncture, meditation, yoga, and tai chi.<sup>5</sup> Data from the 2007 National Health Interview Survey showed that 40% of U.S. residents use 1 or more CAM health practices,<sup>8</sup> spending about \$34 billion per year out of pocket.<sup>9</sup>

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### Harms of CAM

Currently, there is insufficient evidence to support the use of CAM therapies as they lack efficacy.<sup>10</sup> There are also harmful interactions between some CAM therapies and evidence-based medications.<sup>11,12</sup> According to the National Center for Complementary and Alternative Medicine, there is rarely a consensus among CAM experts on the optimal product, dose, or intended users.<sup>13</sup> CAM can also cause harm to patients who choose to forego evidence-based treatment.<sup>14</sup> For example, a recent study demonstrated that patients using alternative medicine as the sole treatment for cancer were 2.5 times more likely to die than patients receiving conventional therapy.<sup>15</sup>

Beyond the negative impact on health, CAM use can put a significant financial burden on patients and may reduce their ability to pay for evidence-based care.<sup>16</sup> In the majority of countries, CAM is not covered by health insurance and patients pay the majority of costs out-of-pocket.<sup>17</sup> Expenditures for CAM services increased by 45.2% between 1990 and 1997 in the U.S. and was estimated to be \$21.2 billion in 1997, with \$12.2 billion paid out of pocket.<sup>17</sup> This amount exceeded the 1997 out-of-pocket expenditures for all hospitalizations in the U.S.<sup>17</sup> These expenditures have continued to increase over the past two decades, with U.S. citizens spending \$30.2 billion out-of-pocket on CAM approaches in 2012.<sup>18</sup>

Despite the fact that CAM is not evidence-based and puts financial strain on patients, its use continues to increase in the United States and around the world. Frass et al. (2012) performed a systematic review of trends in CAM use in Canada, the United States, Austria, Switzerland, Germany, Denmark, Australia, Italy, South Korea, and Britain, and found a significant increase in CAM use in all these countries between 1990 and 2006.<sup>19</sup> Although few scientific data exist for much of the

discipline, CAM has evolved into a successful business throughout the world.<sup>19</sup>

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### Reasons for increased CAM use by the public

The reasons for CAM use are complex and include the costs of evidence-based therapies, dissatisfaction with conventional medicine, and a desire for a more holistic approach to treatment.<sup>19</sup> In developing countries, people rely on CAM to treat most of their diseases because evidence-based therapies are limited and expensive.<sup>20</sup> In developed countries, CAM is more commonly used for disease prevention and health maintenance.<sup>17</sup> People suffering from chronic diseases such as back pain, headaches, arthritis, and cancer tend to use CAM to alleviate their symptoms because they do not find enough symptom relief from conventional therapies.<sup>21,22</sup> National surveys suggest that approximately half of U.S. residents use CAM to treat symptoms, particularly chronic pain.<sup>8</sup>

Patients may also get side effects from evidence-based treatments such as pain and nausea.<sup>23</sup> These side effects may lead patients to seek out CAM therapies that they believe have fewer side effects.<sup>23</sup> This perception is fueled by an increasing public distrust of pharmaceutical companies and drug safety, leading people to pursue CAM therapies that they believe to be more “natural” than conventional medications.<sup>24</sup>

Patients may also believe that CAM provides more holistic care than conventional medicine.<sup>25</sup> CAM supporters argue that evidence-based medicine does not put enough emphasis on health promotion and focuses solely on “sick care”.<sup>26</sup> They claim that CAM focuses more on preventive care than evidence-based medicine.<sup>26</sup>

The media compounds all of these factors by increasingly reporting on CAM therapies with inaccurate or incomplete information.<sup>27</sup> People may believe the media without confirming the accuracy of the information through scientific studies.<sup>27</sup>

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### Public misconceptions about CAM

Many of the factors that are driving CAM use are misconceptions held by the public. For example, preventive medicine, which focuses on factors such as diet, lifestyle, and stress management are all encompassed in evidence-based medicine.<sup>28</sup> Health care professionals who practice evidence-based medicine regularly provide preventive medicine to patients as first-line therapy based on recommendations by clinical practice guidelines.<sup>28</sup> The CAM community often misappropriates preventive medicine as their own and presents conventional medicine as solely focused on prescribing drugs.<sup>26</sup> This message polarizes health care into conventional pharmaceutical medicine versus preventative CAM therapy, misinforming the public and skewing their perception about evidence-based medicine.

Furthermore, CAM therapies have not been shown to be more effective than evidence-based therapies at alleviating symptoms such as chronic pain.<sup>29</sup> Evidence-based medications also do not cause more side effects than CAM therapies.<sup>30</sup> Patients tend to believe that treatments that sound

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