

# Intravenous Vitamin C Therapy (IVC)

High doses of Vitamin C can be given intravenously to potentially treat and/or ameliorate the symptoms of a number of medical conditions<sup>1</sup>.

Conditions for which IVC may be useful:

## Cancer

Vitamin C has quite a long history of use in treating cancer, stretching back to the 1970s<sup>2</sup> and has been used extensively since then<sup>3</sup>, although it remains controversial within the medical community<sup>4</sup>. Much of the more recent research has been done in the laboratory, in animals and in people with advanced cancer.

High dose vitamin C may potentially have various applications in cancer management<sup>5</sup>:

- as an adjunct to chemotherapy, enhancing the effect of the chemotherapy drug to kill the cancer cells<sup>6,7</sup>
- with chemotherapy to help to reduce the side-effects<sup>8</sup>
- as a chemotherapeutic (cancer killing) agent in itself<sup>9</sup>
- improve quality of life<sup>10-13</sup>

Vitamin C taken by mouth (even in the same doses as are given intravenously) does not result in high enough levels of Vitamin C in the blood to significantly impact cancer cells.<sup>14,15</sup> This is probably due to a number of factors including the way the body controls the uptake of Vitamin C from the bowel.<sup>16</sup> This is why it is necessary to give Vitamin C intravenously. In one study patients with the highest concentration of Vitamin C in the blood were able to maintain their physical quality of life, despite suffering with advanced cancer.<sup>17</sup>

IVC and other anti-oxidants appear to enhance the cancer-killing effects of chemotherapy and radiation, although how this works is not fully understood.<sup>6,9,18,19</sup> Also, IVC and other anti-oxidants may decrease the side-effects of chemotherapy and radiotherapy.<sup>20</sup> Patients who have received IVC and other nutrients, as well as chemotherapy appear to improve more than expected.<sup>8</sup> Vitamin C has not been studied in all the different types of cancer, but the general trend across the board in people with cancer is positive.

While there have been reports of prolonged survival using IVC<sup>7,21-23</sup>, there is also evidence for improving the quality of life with the potential for less fatigue, nausea, vomiting, sleep problems and depression, as well as increased appetite<sup>10-13</sup>.

## Other Conditions

High dose vitamin C has been used to treat numerous other conditions<sup>24,25</sup>, although these conditions have not been as extensively studied and some of the evidence does not support IVC<sup>26</sup>:

- infections<sup>27,28</sup>
- rheumatoid arthritis<sup>29,30</sup>
- fatigue<sup>31,32</sup>

IVC is considered to be part of complementary and alternative medicine (CAM – please see <https://www.mcnz.org.nz/assets/standards/Complementary-and-alternative-medicine.pdf>) and is not generally supported by mainstream medicine. Although there is some evidence for benefits from IVC, as referenced, we do not suggest it is scientifically validated and many aspects remain controversial. There are moderate costs in providing IVC and there can be risks as noted below.

## Side Effects

High dose IVC of up to 1.5g / kg (higher doses have also been used) given daily has been shown to be generally safe with few side-effects<sup>33,34</sup> and can be used over a long period of time.<sup>9</sup>

Side-effects experienced by a small number of patients are related to the infusions of a concentrated fluid solution and include: abdominal cramps, diarrhea, nausea, vomiting, headache, dizziness, fatigue, facial flushing, perspiration and weakness. Irritation can occur at the site of the drip and recurrent infusions can cause thickening and/or collapse of the vein. These side-effects can usually be prevented by drinking fluids before and during the infusion and are also helped by the addition of calcium gluconate and magnesium sulphate to decrease the acidity of the infusion<sup>3,17</sup>. If the needle becomes dislodged from the vein it can temporarily cause discomfort from the vitamin C escaping into the surrounding tissue.

The development of kidney stones have been described in patients receiving IVC who had a past history of kidney stones<sup>3</sup>, although this has been disputed in a prospective case series study<sup>35</sup>. IVC may possibly affect kidney function in severely unwell patients and it is not used in patients with severe kidney failure<sup>35</sup>. A blood test for kidney function needs to be available prior to starting treatment and be monitored at intervals during treatment.

People with a rare genetic disorder called glucose-6-phosphate dehydrogenase (G6PD) deficiency are unable to tolerate high dose IVC.<sup>36</sup> You will need to have a blood test for this prior to receiving high dose IVC (there is now a charge for this test by Medlab and you will need to pay in cash when the blood is taken).

IVC has occasionally caused severe bleeding from cancer tumours in a few patients with end-stage rapidly growing cancers.<sup>37</sup> Suddenly stopping high doses of vitamin C may possibly cause a rebound effect when used for severe sepsis<sup>38</sup>.

## Practical details

All patients need to sign a consent form.

Scheduling of infusions is done by our clinic nurse. It takes time to make up the IV fluids and they cannot be used after 24hrs once made up, so it is important to let us know if you are unable to attend an IV appointment, by 9am that day at the absolute latest (if an IV infusion has been prepared and a patient misses the appointment without letting us know, a fee for the infusion may be charged).

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