

# Risk Factors for More Severe Cases of COVID-19 in Lymphedema Patients



*“The current pandemic of COVID-19 and the risk of SARS-CoV-2 poses a particular risk to people living with preexisting conditions that impair immune response or amplify pro-inflammatory response.”<sup>1</sup>*

## **Permanently Impaired Immune Systems – 100% of patients** **Additional Cancer-Related Immunosuppression – up to 66% of patients**

**Lymphedema patients have permanently impaired immune function.**<sup>2 3 4</sup> The lymphatic system directly and indirectly regulates immune response. Even in secondary lymphedema, abnormal lymphatic function is systemic.<sup>5 6 7</sup> Cancer patients and survivors, who comprise two-thirds of all lymphedema patients, often have additional long-term or even permanent immunosuppression.<sup>8 9 10 11</sup>

## **Obesity – at least 65% of patients**

**The prevalence of obesity within the lymphedema population is more than double that of the general population.** Obesity is both a cause of lymphedema and can also be the result of lymphedema.<sup>12 13</sup> Informal assessments in the US have estimated that 50-80% of American lymphedema patients are obese.<sup>14</sup> A formal study in the United Kingdom found 64.6% of lymphedema patients to be obese, 2.32 times higher than the prevalence of obesity in their general population.<sup>15</sup>

## **Age 60 or Older – more than 50% of patients**

**Half of all lymphedema patients are seniors on Medicare, an estimated 1.5-3 million Americans.**<sup>16</sup>

## **Additional Risk Factors – 100% of patients**

**Lymphedema patients carry excess fluid loads and suffer from chronic inflammation.** Lymphedema is characterized by persistent swelling in one or more parts of the body due to impaired lymph transport,<sup>17</sup> and also results in localized as well systemic inflammation.<sup>18 19</sup>

<sup>1</sup> COVID-19 and the role of chronic inflammation in patients with obesity - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7224343/>

<sup>2</sup> Regulation of Immune Function by the Lymphatic System in Lymphedema - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6431610/>

<sup>3</sup> Modulation of Immunity by Lymphatic Dysfunction in Lymphedema - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6361763/>

<sup>4</sup> T-regulatory cells mediate local immunosuppression in lymphedema - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5794510/>

<sup>5</sup> Lymphatic dysfunction in the apparently clinically normal contralateral limbs of patients with unilateral lower limb swelling. - <https://www.ncbi.nlm.nih.gov/pubmed/22157021/>

<sup>6</sup> Lymphatic abnormalities in the normal contralateral arms of subjects with breast cancer-related lymphedema as assessed by near-infrared fluorescent imaging. - <https://www.ncbi.nlm.nih.gov/pubmed/22741072/>

<sup>7</sup> Local vascular access of radioprotein injected subcutaneously in healthy subjects and patients with breast cancer-related lymphedema. - <https://www.ncbi.nlm.nih.gov/pubmed/15136628/>

<sup>8</sup> Lymphedema: Not One Disease - <https://lymphedematreatmentact.org/wp-content/uploads/2020/05/Lymphedema-Not-One-Disease-full-bleed.pdf>

<sup>9</sup> Significant Impairment in Immune Recovery Following Cancer Treatment - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2777669/>

<sup>10</sup> Lymphocyte depletion and repopulation after chemotherapy for primary breast cancer - <https://breast-cancer-research.biomedcentral.com/articles/10.1186/s13058-015-0669-x>

<sup>11</sup> Why People with Cancer are More Likely to Get Infections - <https://www.cancer.org/treatment/treatments-and-side-effects/physical-side-effects/low-blood-counts/infections/why-people-with-cancer-are-at-risk.html>

<sup>12</sup> Lymphedema and Obesity: Is There a Link? - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4393748/>

<sup>13</sup> IL-6 Regulates Adipose Deposition and Homeostasis in Lymphedema - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4024716/>

<sup>14</sup> A New Look at Lymphedema and Obesity: Breaking the Cycle - <https://klosetraining.com/2014/09/02/lymphedema-and-obesity-part-i/>

<sup>15</sup> LIMPRINT in Specialist Lymphedema Services - <https://www.liebertpub.com/doi/pdf/10.1089/lrb.2019.0021>

<sup>16</sup> <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3652571/#R1>

<sup>17</sup> Lymphedema diagnosis, treatment, and follow-up from the view point of physical medicine and rehabilitation specialists - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6657795/>

<sup>18</sup> Inflammatory Manifestation of Lymphedema - <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5297803/>

<sup>19</sup> Cytokines are Systemic Effectors of Lymphatic Function in Acute Inflammation - <https://www.ncbi.nlm.nih.gov/pubmed/23764549>