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From Remission and Regression of Diseases to Controlled Normal Life Activity

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Abstract

Remission and regression are concepts related to disease dynamics, particularly in oncology, but also used in other areas of medicine. They describe the reduction or disappearance of symptoms and signs of a disease, which can lead to the restoration of normal life. However, it is important to understand that remission does not always mean a complete cure, while regression indicates a stable improvement in a patient's condition. Upon achieving remission or regression, a patient can gradually return to their normal life, engage in professional activities, interact with different people, and maintain physical activity. Remission and regression are important stages in disease treatment. Modern technologies for disease remission and regression are actively developing in several areas, including cancer, autoimmune, and rheumatic diseases. These include both established methods and innovative approaches based on advances in genetic engineering, immunotherapy, and other technologies. Research into disease remission and regression is an active area of research aimed at improving patient outcomes and developing more effective therapeutic strategies. Research into disease remission and regression spans various fields of medicine, including oncology and endocrinology. Studies show that early and long-term remission improves functional outcomes. Efforts to standardize remission and regression across various fields of medicine are ongoing to improve diagnosis, functional status, and comparison of research results.

Keywords: remission and regression of diseases, rehabilitation, controlled normal life activity

1. Introduction

Disease remission ensures a state of stability:

* Disease remission is often the result of treatment: medication, psychotherapy, and lifestyle changes.

* During remission, it is important to continue to be monitored by a doctor and follow their recommendations to ensure that discontinuing therapy does not lead to a relapse.

* The duration of remission varies from person to person and depends on the type of disease, its stage, the treatment received, the individual's individual characteristics, and other factors.

During remission, a person can:

* Return to work and other activities that brought them joy before the illness;

* Restore or improve relationships with loved ones;

* Reduce medication doses (sometimes completely discontinue them under a doctor's supervision);

* Feel in control of their life.

With many chronic diseases (mental, somatic, oncological), remission allows a person to lead a full life: study,

work, build relationships, and pursue hobbies. However, it is important to understand that this does not guarantee a full recovery, and continued medical monitoring is necessary.

Disease regression can be either a natural or induced process, which in some cases allows for a return to normal life. However, this is not a universal phenomenon, and its success depends on the type of disease, the timeliness of treatment, and rehabilitation. In cases where regression is associated with psychological mechanisms, additional support may be required to adapt to life after illness.

Returning to normal life after illness often requires rehabilitation — a set of measures aimed at restoring a person's physical, mental, and social well-being. Rehabilitation may include:

Medical care: medication therapy, physiotherapy, orthopedic support.

Physical rehabilitation: exercises, breathing exercises (e.g., after pneumonia).

Psychological support: mental correction and psychotherapeutic methods to restore mental and emotional well-being.

Social and vocational adaptation: assistance with employment, training in new skills.

Remission and regression of diseases return patients to controlled normal life activities.

2. Disease Remission

Remission is a period of the disease course when symptoms significantly diminish or disappear completely. However, the risk of relapse — a return of the disease — remains. The term is applied to various diseases: mental, infectious, genetic, autoimmune, oncological, and others.

2.1 Types of Remission

(1) By degree of symptom reduction:

Complete. Symptoms are completely absent, and examination results (tests, instrumental studies) are normal or close to normal. This is considered the most favorable outcome of the disease. However, even with complete remission, the risk of relapse remains, as pathological cells may remain in the body.

Incomplete (partial). The patient's condition is stable, but objective indicators (laboratory or instrumental study data) are abnormal. For example, in oncological diseases, this may be a fragmentary tumor removal, leaving a portion of it in the body.

Clinical. Subjective improvement in well-being: pain subsides, temperature and blood pressure return to normal, etc. However, objective signs of the disease may persist. This condition often causes concern among physicians, as patients may discontinue treatment, and the disease may progress unnoticed.

(2) By duration:

Persistent. Can last for years or decades. The person returns to their normal life, but if the immune system is weakened, the disease may return. In oncology, a five-year disease-free period is often considered a benchmark; however, this period is arbitrary and depends on the type of disease, stage, and treatment.

Unstable. Short-term relief, during which the disease can quickly return. This is often indicated by unstable test results.

(3) Other types:

Spontaneous. Disappearance or significant reduction in disease manifestations without specific treatment. Rare and poorly studied.

Molecular (in oncology). Using ultra-sensitive methods, specific genetic defects characteristic of the patient's tumor cannot be detected in the patient's blood.

2.2 Remission in Various Diseases

Oncological Diseases. Remission means that the tumor is responding to therapy and its progression can be controlled. Surgery, chemotherapy, radiation therapy, targeted therapy, and immunotherapy are used to achieve remission (Kelly A. Turner, 2014). Even with complete remission, the risk of relapse remains, so the patient requires regular monitoring by an oncologist.

Mental Disorders (depression, bipolar disorder, anxiety disorders, etc.). Remission allows the patient to return to work, social activities, and hobbies. With mild depression, remission can occur within 2-4 weeks of starting treatment; with more severe conditions, it can take several months to a year.

Autoimmune diseases (multiple sclerosis, type 1 diabetes, Hashimoto's thyroiditis, etc.). Remission can occur when inflammation subsides or stress is relieved. The likelihood of remission is influenced by the rate of target tissue regeneration and the activity of the immune system (Chiara Tani, Roberta Vagelli & Chiara Stagnaro,

2018; Elkoshi Z., 2025).

Infectious arthritis. For example, the virus remains in the body, but its activity is suppressed by the immune system. When the immune system is weakened, a relapse may occur. In such situations, remission of infectious arthritis is used (Iona Donnelly, 2018; Marina G. Birck et al., 2025).

2.3 Recommendations During Remission

* Follow the treatment plan: continue taking prescribed medications and visit your doctor regularly.

* Avoid emotional stress and overwork.

* Maintain a healthy lifestyle: quit bad habits, sleep at least 7-8 hours a day, and spend more time outdoors.

* If new or unusual symptoms appear (weight loss, weakness, pain, bleeding, etc.), consult a doctor for further examination.

It's important to remember that remission does not equate to a full recovery. Only a doctor can assess your condition and provide recommendations for further monitoring and treatment.

3. Disease Regression

In medicine, regression is a stage in the course of a disease during which clinical manifestations gradually disappear, followed by restoration of the patient's health. The term is used in various fields of medicine, with some differences in meaning (Castillo H, et al., 2008; Worley G. et al., 2015; Ghaziuddin N. et al., 2017; Mircher C. et al., 2017; Ernest Yeboah Boateng & Daniel A. Abaye, 2019; Santoro S. L. et al., 2020; Rosso M. et al., 2020; Ton J. Cleophas & Aeilko H. Zwinderman, 2021; Santoro J. D. et al., 2022; Santoro J. D. et al., 2022; Bonne S et al., 2023; Wang, T., 2026).

3.1 Main Types of Regression

(1) Tumor Regression (in Oncology)

Complete regression — the absence of viable tumor tissue based on examination data and signs of metastasis.

Partial regression — a reduction in tumor size or volume by more than 50% in the absence of new metastases.

Spontaneous regression — a rare phenomenon in which a malignant tumor disappears without specific antitumor treatment or with inadequate therapy (Evgeny Bryndin, 2025a). More common in:

* Melanoma;

* Renal cell carcinoma;

* Neuroblastoma;

* Certain types of blood cancer.

The mechanisms of spontaneous regression are not fully understood. Possible causes include:

* Activation of the immune system against tumor antigens;

* Hormonal changes;

* Tumor necrosis;

* Cell apoptosis;

* Infections, etc.

(2) Histological regression — a decrease in the number of neoplastic (tumor) cells within the tumor or their complete disappearance. For example, in melanoma, this may be accompanied by fibrosis, the appearance of new vessels, and inflammation.

(3) Caudal regression syndrome — a rare congenital malformation characterized by abnormalities of the lower spine and often damage to the lower extremities and internal organs. The term is used here not to describe the course of the disease, but as a name for the disorder itself. Causes may include genetic mutations (for example, in the VANGL1 gene) and environmental factors.

(4) Regression in psychiatry is not an improvement in a patient's condition, but a defense mechanism of the psyche: a return to less mature behavior patterns under stress (moody, tearfulness, etc.).

(5) Regression to the mean (in medical statistics) is a statistical phenomenon whereby extreme values (for example, very high blood pressure) naturally return to the mean without any treatment.

3.2 Difference Between Regression and Remission

While both terms describe an improvement in a patient's condition, there are differences between them:

Regression most often refers to a reduction or disappearance of a pathological lesion (e.g., a tumor) and can lead

to a full recovery. In oncology, this term is often used synonymously with positive dynamics during treatment.

Remission is a period of decreased disease activity, when symptoms diminish or disappear, but the risk of relapse remains. Remission does not always mean that the pathological process has completely stopped.

3.3 Transition from Remission to Regression

The transition from remission to regression can occur for several reasons:

Persistence of individual tumor cells. Even during remission, isolated malignant cells may remain in the body, which after a while begin to actively divide.

Decreased immunity. If the immune system weakens, this can trigger the growth of remaining pathological cells.

Cellular adaptation to treatment. Cancer cells can develop resistance to chemotherapy drugs by changing their genetic programming.

Stress and other external factors. These can negatively impact overall health and contribute to disease progression.

Failure to comply with doctor's recommendations. For example, refusal of maintenance therapy or poor diet.

Regression assessment should be based not only on the patient's well-being but also on objective examination data (tests, biopsies, imaging, etc.).

4. Innovations in Disease Regression and Remission

Innovations in disease regression and remission involve the application of modern data analysis technologies, personalized medicine, and the development of new treatments and disease management methods. Particular attention is paid to machine learning, genetic research, and combination therapeutic approaches.

4.1 Machine Learning and Remission Prediction

Machine learning (ML) methods enable the analysis of large volumes of clinical, laboratory, and genetic data to predict remission and treatment response. For example, algorithms such as lasso regression, ridge regression, support vector machines (SVM), random forests, XGBoost, and SHAP (Shapley Additive Explainer) have been used in rheumatoid arthritis (RA) research. These methods helped identify key clinical variables associated with remission with different biologic agents (e.g., age for adalimumab, rheumatoid factor for etanercept, and erythrocyte sedimentation rate for infliximab and golimumab).

In the case of psoriatic arthritis, XGBoost and logistic regression were used to predict 12-month remission based on the DAPSA index. Machine learning algorithms are also used to predict hospitalization and outpatient corticosteroid use in patients with inflammatory bowel disease (IBD).

4.2 Genetic and Molecular Research

Finding genetic determinants of diseases using machine learning and systems biology opens new possibilities for personalized medicine. For example, models predicting the risk of IBD based on single nucleotide polymorphisms (SNPs) were built using data from the Immunochip project. Research in genetics and immunology helps identify biomarkers that may indicate the likelihood of remission or disease progression.

4.3 Managing Regression of Pathological Processes

In some cases, it is possible to manage the natural process of disease regression. For example, with herniated discs, spontaneous resorption (reduction or disappearance of the herniation) is observed in approximately 36% of cases. Doctors can accelerate this process with a combination of drug therapy (aimed at relieving pain and treating the underlying cause) and physical therapy (magnetic therapy, laser therapy, shockwave therapy, etc.) — the so-called modulated resorption method.

4.4 Combination Therapy Approaches

In oncology, combination treatments (for example, chemotherapy combined with radiation therapy) sometimes lead to complete regression even in advanced cancers. For example, a case of ten-year complete remission in disseminated small cell lung cancer with central nervous system involvement after six cycles of chemotherapy is described.

4.5 Personalized Medicine

A personalized approach involves dividing patients into groups based on the type and severity of the disease, the likelihood of its progression, and its response to treatment. This is achieved through the analysis of clinical, laboratory, genetic, and other data. Personalized medicine enables the selection of the most effective treatment regimens to achieve remission and minimize side effects.

4.6 Challenges and Prospects

Despite progress, the implementation of machine learning and personalized medicine methods in clinical practice faces a number of challenges:

* The need for large volumes of data to train models;

* Ethical issues related to sharing patient data;

* The need to standardize the development and presentation of algorithms;

* The difficulty of integrating new methods into existing medical information systems.

Technological advances promise further advances in disease prognosis, improved treatment outcomes, and prolongation of remission.

Thus, innovations in the field of disease regression and remission encompass both technological (machine learning, big data analysis), as well as organizational, infrastructural, methodological and other areas, which opens up new prospects for medicine (Evgeny Bryndin, 2025b; 2025c; 2026a).

5. Monitoring Normal Lifestyle

Maintaining normal life during remission or regression includes:

Medical monitoring. Regular medical check-ups, laboratory and instrumental examinations (CT, MRI, PET-CT, blood tests, etc.) to promptly detect relapse or disease progression.

Maintenance therapy. Prescribing medications to maintain the achieved state (e.g., hormonal therapy for hormone-dependent tumors, targeted or immunotherapy drugs).

Lifestyle modification. A balanced diet (e.g., a Mediterranean diet with plenty of vegetables, fruits, fish, and olive oil), quitting smoking and alcohol, moderate physical activity (e.g., walking).

Weight control. Excess fat tissue can provoke the growth of cancer cells.

Psychological support. Dealing with anxiety and fear of relapse, possibly with the participation of a psychologist or Psycho-oncologist.

Avoiding risk factors. For example, excessive sun exposure in some types of cancer.

5.1 Factors Affecting the Risk of Recurrence

Disease biology. Some tumor types (e.g., testicular cancer, some lymphomas) tend to have long-term remission, while others (pancreatic cancer, triple-negative breast cancer) tend to relapse early.

Disease stage. Early detection and treatment increase the chances of long-term remission.

Treatment effectiveness. Incomplete tumor removal during surgery and cell resistance to therapy increase the risk of recurrence.

Immune system status. A strong immune system more effectively suppresses remaining pathological cells.

Following doctor’s recommendations. Irregular monitoring, poor diet, and unhealthy habits can increase the risk of recurrence.

5.2 Important Recommendations

* Continue treatment and monitoring even if you feel better.

* If new symptoms appear (weight loss, weakness, pain, lumps, etc.), consult a doctor immediately.

* Discuss any lifestyle changes (pregnancy, job change, relocation) with your doctor.

* Avoid self-medication and taking dietary supplements without consulting a specialist.

Approaches to managing the condition depend on the type of disease, its stage, the treatment received, and the individual characteristics of the patient.

6. Conclusion

To maintain a normal condition after treatment and maintain an active lifestyle, we recommend:

Regularly see a doctor. Scheduled visits to a specialist (oncologist, internist, or other specialist doctor) allow for timely detection of changes and adjustments to treatment.

Follow treatment recommendations. This may include taking medications and supportive therapy (hormonal, targeted, and immunotherapy).

Lead healthy lifestyle. Eat a balanced diet, quit smoking and drinking alcohol, control your weight, and manage stress (Evgeny Bryndin, 2023).

Maintain physical activity. Moderate exercise (walking, swimming, and exercise therapy) improves overall

well-being, reduces the risk of complications, and improves quality of life.

Monitor your emotional state. Get psychological support, stress management techniques, and, if necessary, individual or group therapy.

Avoid risk factors. For example, hypothermia, excessive exertion, and exposure to infections.

Approaches to disease management depend on the type of disease, its stage, the treatment received, and the individual characteristics of the patient. All decisions should be made in consultation with the treating physician.

The key goals of remission and regression strategies (weakening and neutralizing diseases) are the implementation of advanced medical technologies (Bryndin E.G. & Bryndina I.E., 2018; Evgeny Bryndin, 2025d; 2025e; 2026b; 2025f).

Potential modern medical approaches to achieving a disease-free life:

(1) Genetic engineering and CRISPR. CRISPR technology allows for highly precise DNA editing. Scientists are exploring the possibility of modifying genes responsible for aging, lengthening telomeres, and eliminating genetic diseases that increase vulnerability to age-related diseases.

(2) Regenerative medicine and stem cells. Stem cell therapy can restore damaged organs and tissues. 3D bioprinting of living tissues and organs is also developing, potentially allowing for the replacement of worn-out or diseased organs.

(3) Nanotechnology and nanobots. Miniature robots may be used in the future to find and fix problems in the body: destroy cancer cells, bacteria, and repair damaged tissue.

(4) Fighting inflammaging. Scientist Claudio Franceschi believes that the main cause of age-related diseases is low-grade chronic inflammation (inflammaging), not associated with infections. Developing methods to control this process can slow down and reduce the risk of age-related diseases.

(5) Optimization of lysosome function. Lysosomes are membrane sacs in cells that break down unnecessary components. Research has shown that activating lysosomes can help remove toxic proteins and rejuvenate cells.

(6) Digital correction of consciousness. Correction of an individual's consciousness in the digital form of a biological body. The technology is being improved towards the safe correction of damaged consciousness (Evgeny Bryndin, 2021; 2026c).

Innovations in the field of disease regression and remission encompass technological, organizational, infrastructural, methodological, and other areas, opening up new prospects for the development of medicine and healthcare.

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