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# **Evaluation of WELL Covid-19 Certificate Structure and Criteria**

WELL Covid-19 Sertifika Yapısı ve Kriterlerinin Değerlendirilmesi

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#### ÖZ

Küresel çevre sorunlarının, salgın hastalıkların ve doğal afetlerin artması insan yaşamında ve toplumsal yaşam biçiminde önemli değişikliklere neden olmuştur. 2019 yılının sonunda ortaya çıkan ve tüm dünyayı etkisi altına alan Covid-19 salgını sonucunda binlerce kişi hayatını kaybetti. Salgın sürecinde sürdürülebilir ve sağlıklı yaşam tarzları ve mekânların oluşturulması önem kazanmıştır. Pandemi ve enfeksiyonlara karşı özellikle kapalı mekânlarda önlem alınmazsa, hastalığın bulaşma riski ve hızı artmakta, insan sağlığı ve güvenliğini tehdit etmektedir. Binaların pandemiye uygun olarak tasarlanması bağlamında yetkililer, daha sağlıklı ve daha sürdürülebilir iç mekânlar sağlamak için WELL Covid-19 Sağlıklı Bina Sertifikasını geliştirdi. Sertifika, oluşturulduktan hemen sonra birçok ülkede etkin bir şekilde kullanılmaya başlandı. Ayrıca WELL Covid-19 Sağlıklı Bina Sertifikası, uzun süredir sertifika hizmeti veren LEED gibi önemli kuruluşlar tarafından da kabul görmüştür. Bu kapsamda çalışmada WELL Covid-19 Sağlıklı Bina Sertifikası almış bir binada sertifikanın genel yapısı ve değerlendirme kriterleri kapsamlı bir şekilde incelenmiştir.

Anahtar Kelimeler: Sağlıklı Binalar, Sertifika Sistemleri, WELL, Covid-19

#### ABSTRACT

The increase in global environmental problems, epidemics and natural disasters has caused important changes in human life and social life style. Thousands of people died as a result of the Covid-19 epidemic, which emerged at the end of 2019 and continues to have an impact all over the world. In the epidemic process, the creation of sustainable and healthy lifestyles and spaces has gained importance. If measures are not taken against pandemics and infections, especially indoors, the risk and speed of transmission of the disease increases, threatening human health and safety. In the context of designing buildings in accordance with the pandemic, the authorities have developed the WELL Covid-19 Health Safety Rating to provide healthier and more sustainable interior spaces. Right after its creation, the certificate started to be used effectively in many countries. In addition, WELL Covid-19 Health Safety Rating has been accepted by important organizations such as LEED, which has been providing certificate services for a long time. In this context, in the study, the purpose, method, evaluation criteria and functioning of the WELL Covid-19 Health Safety Rating were obtained as a result of literature research. In addition, the general structure and evaluation criteria of the certificate have been extensively examined on a building that has received WELL Covid-19 Health Safety Rating.

Keywords: Healthy Building, Certification Systems, WELL, Covid-19

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#### **INTRODUCTION:**

Humankind has affected the Earth and the ecosystem in many ways from the first ages to the present day. While the destruction of the natural environment, unconscious planning of living spaces and ineffective protection of historical heritage cause negative situations, more environmentalist technical and technological approaches, new political order and lifestyles have been developed in order to solve or reduce the problems that arise. As a result, the perspectives of individuals towards themselves and their environment have also changed. Especially in recent years, climate changes, global epidemics, technological accidents have drawn people's attention to areas such as sustainability, healthy living and protection of the natural environment. These ideas, which have been discussed for a long time in architectural practice, have increased their sphere of influence within the framework of the events; It has also become the focus of many designers, investors and individuals.

The concept of sustainability, which has been taking place more and more in our lives since the 1970s, shows itself in building design under many headings such as energy conservation and effective use of renewable energy resources. In addition to the individual applicability of these ideas, the audit and incentive studies carried out by various institutions and organizations are also important. At the beginning of these studies, energy certificates come. By introducing BREEAM Certificates in 1990 and LEED Certificates in 1998, more solid steps have been taken for the future by developing perspectives on energy in architectural practice and on societies. Over the years, many energy certificates issued by different institutions, measuring various criteria and compatible with different building typologies, have also been put into use. Especially technological, social, political and environmental changes have caused these certificates to develop and renew themselves continuously.

In time, in addition to the certificates that can be collected under the titles of environmental sustainability and energy, certificates that can serve the titles of user and building health and welfare have emerged. The WELL Healthy Building Standard, which was organized by The International WELL Building Institute (IWBI) in 2014, can be given as an example of this situation. The WELL Healthy Building Standard prioritizes user health and comfort during the building design, production, operation and use phases. To enable users to continue their lives in healthier environments; it aims to make the right design, implementation and business decisions (Osso, 1996; quoted by Ölmez, 2019).

#### **MATERIAL AND METHOD:**

The current global pandemic conditions have undoubtedly caused The WELL Building Standard, which has effective studies on human and building health, to question itself and to be effective on new decisions to be taken. Individuals who have to work during the pandemic process want to provide the health and comfort conditions in their working environment. Faced with such a situation, many companies and executive institutions have proven themselves to other companies in the market, especially their employees and customers, as a result of the degrees they received by applying fortthe WELL Covid-19 Health Safety Rating.

Within the study, the purpose, method, evaluation criteria and functioning of the WELL Covid-19 Health Safety Rating were examined. The WELL Covid-19 criteria obtained as a result of the literature research were evaluated on the Empire State Building, which was chosen as a sample building.

#### **RESEARCH FINDINGS AND DISCUSSION:**

WELL Building Standard is used as WELL v2 pilot in 2018 and WELL v2 certificate in 2020, following the WELL v1 study published in 2014. The WELL Building Standard prepares a study with different

evaluation criteria and scores for each version and analyzes the buildings that apply to them. Buildings can get their certificates in some degrees determined by the standard after they get the minimum points required for the stages they apply for. The WELL v2 Q3 certificate, which is the latest version of The WELL Building Standard published by IWBI, works under 11 titles and a total of 122 evaluation criteria. Buildings according to this evaluation system; can reach bronze, silver, gold and platinum grades. If they reach 40 points in total from the categories, they receive the WELL Bronze certificate, if they reach 50 points, they receive the WELL Silver certificate, if they reach 60 points, they receive the WELL Gold certificate and if they reach 80 points, they receive the WELL Platinum certificate (WELL, 2021).

The WELL Covid-19 Health Safety Rating can be termed as a subset of the WELL Building Standard, which covers health issues more comprehensively. It provides an accessible introduction to the WELL Building Standard and the WELL Portfolio program. Investors or managers can follow the WELL Covid-19 Health Safety Rating separately for their projects, or use it as a step before the WELL Standard (Ecobuild, 2021).

The WELL Covid-19 Health Safety Rating does not have any degrees. Buildings receive their certificates when they meet the conditions of the WELL Covid-19 Health Safety Rating. WELL Covid-19 Health Safety Rating performs the analysis with 26 evaluation criteria under 6 headings in total. In addition to focusing on the potential risks associated with infectious diseases, this certification includes strategies to reduce mold, legionnaire disease, and air and water quality pollutants. It also focuses on occupant communication and participation, as well as contingency planning and operations, to raise awareness and participation in creating a healthy and safe environment. The rating system contains strategies to support resident and employee health, with a focus on sick leave policies, community immunity and mental health during crises (Table 1) (WELL Covid-19, 2021).

Table 1. Evaluation criteria of WELL Covid-19 Health Safety Rating (WELL Covid-19, 2021)

Cleaning and Sanitization Procedures Features	Emergency Preparedness Programs
SC1 Support handwashing SC2 Reduce surface contact SC3 Improve cleaning practices SC4 Select preferred cleaning products SC5 Reduce respiratory particle exposure	SE1 Develop emergency preparedness plan SE2 Create business continuity plan SE3 Plan for Healthy Re-entry SE4 Provide emergency resources SE5 Bolster emergency resilience
Health Service Resources	Air and Water Quality Management
SH1 Provide sick leave SH2 Provide health benefits SH3 Support mental health recovery SH4 Promote flu vaccines SH5 Promote a smoke-free environment	SA1 Assess ventilation SA2 Assess and maintain air treatment systems SA3 Develop legionella management plan SA4 Monitor air and water quality SA5 Manage mold and moisture
Stakeholder Engagement and Communication	Innovation
SS1 Promote health and well-being SS2 Share food inspection information	SI1 Innovation I SI2 Innovation II SI3 Innovation III SI4 Gateways to Health-Safety

WELL Covid-19 Health Safety Rating; It emerged when a group of approximately 600 public health experts, government officials, academics, business leaders, virologists, designers, architects and construction scientists started working in the scope of IWBI in March 2020.

The WELL Covid-19 Health Safety Rating proves that the building owner, his building and office spaces are at a protective standard against Covid-19 and similar pandemics and disasters. WELL Covid-19 Health Safety Rating provides the standards for the Ministry of Health of the Republic of Turkey, the Ministry of Labor of the Republic of Turkey, the US Ministry of Labor, the World Health Organization, the UN and all other international pandemics (Ecobuild, 2021).

All building types can obtain the WELL Covid-19 Health Safety Rating. The certificate covers new and existing building, commercial interior and core-shell office buildings. Pilot standards exist for multifamily residential buildings, commercial kitchens, educational structures, retail stores and restaurants.

Comprehensive audits, various incentives and sanctions are needed for the effective use of WELL Covid-19 Health Safety Rating on a global scale, like all scoring-based certification evaluation systems. However, with the use of this scale and scope, WELL Covid-19 Health Safety Rating can prevent the health problems and pandemics that occur today. In this context, within the scope of the study, it has been discussed in order to contribute to the widespread use of the WELL Covid-19 Health Safety Rating. In the study, evaluations were made on the Empire State Building, which received the WELL Covid-19 Health Safety Rating, to better explain the certificate structure, criteria, evaluation system and the processes involved. The Empire State Building was chosen for the case study within the scope of the study, as it is iconic in the field of architecture and engineering, consumes a large amount of energy and accommodates many users.

# 1.Evaluation of Empire State Building According to WELL Covid-19 Health Safety Rating

Despite being built as a commercial center, the Empire State Building has become one of the most recognizable structures in the world. Construction of the Empire State Building began in 1930 under the direction of architects Shreve, Lamb & Harmon Associates. The construction of the building was completed in a short period of 410 days and it became the tallest building in the world (Figure 1). The Empire State Building has been carrying out various works such as maintenance, repair and renewal for a long time in line with the targets it has set in topics such as sustainability and energy conservation (Figure 2).





Figure 1. Empire State Building (ESB,2021)



**Figure 2.** Maintenance work on the facade of the building (Mattani,2020)

As a result of these studies, 2020 was a productive year for the building. The building received a 76% rating from the Energy Star Certification, a Gold rating from the LEED EB O&M v4 Certification, an 83% rating from the Fitwell Certification, the Green Lease Gold leadership of 2020, and a 100% rating from the WELL Covid-19 Health Safety Rating. In addition, the Empire State Building was the first building in the country to receive the WELL Covid-19 Health Safety Rating within the scope of procedures and protocols in response to the Covid-19 pandemic (ESRT, 2020).

According to the 2020 Sustainability Report published by the Empire State Building management, they focused on energy efficiency, water efficiency, recycling and waste in their work and integrated these thoughts into each of the managers, users and employees of the building. In this direction, the building has become a completely sustainable design over time. In line with the determined target and perspective, we see that the works on the building are grouped under 3 main headings. Various studies have been carried out for each of these titles, which are divided into environmental sustainability, social responsibility and governance, and the desired targets have been achieved.

# 1.1. Empire State Building and Environmental Sustainability

Environmental sustainability has been examined in terms of energy, carbon emissions, waste and recycling, and water headings throughout the building, and studies have been carried out in this direction. The building has adopted some procedures to implement sustainability programs and achieve its goals. These procedures provide a reference in determining energy strategies, using best practices and resource management (ESRT, 2020).

Some of the procedures used are:

- Adaptation and Resilience to Climate Change.
- Environmental Management System based on ISO 14001
- Water Management
- Indoor Quality
- -Sustainable Waste Management
- Energy and Greenhouse Gas Management





Empire State Building provides training to its employees and related companies for waste management throughout the building. As a result of these trainings, they explain the logic and application methods of waste management to the other party and conduct waste inspections throughout the building. A pilot organic program has been developed to encourage building users. In addition, programs for the reuse and donation of indoor furniture and for the implementation of electronic waste collection were also carried out.

Water efficiency strategies are implemented to reduce water consumption throughout the building and the impact of the building on the environment. Water consumption strategies are formed by using meters and pilot technologies together. As part of the standards determined in the wet areas of the building, EPA WaterSense approved luminaires are used, which save 40-50%. Water submeters are used to monitor and measure water consumption. These meters enable the identification of suitable areas for end-use and targeted reduction, leaks on the system and potential areas to reduce water efficiency.

Water usage monitoring artificial intelligence software is used to ensure water efficiency in the building. It is used to detect and stop water leaks in specific areas, monitor water consumption and analyze water usage trends. According to the measurement made on 31 December 2020, 30% of the targets set were achieved thanks to this smart system (Figure 3).



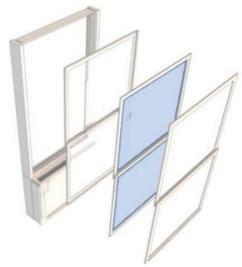
Figure 3. Water management (m3) (ESRT, 2020)

One of the basic principles of the Empire State Building in energy efficiency is indoor air quality. In line with this principle, bipolar ionization air cleaning technology, Merv 13 air filters, indoor air quality tests, CO2 sensors and low-emission materials, productive areas, pest management strategies, systems that monitor building health are used. The integration of these systems and more into the building and their active work at the user, manager and employee levels have been important for the building to receive the WELL Covid-19 Healthy Building Certificate. For example, bipolar ionization air cleaning technology is used in more than 90,000 m2 of the building, and this system neutralizes 99.92% of the coronaviruses in the building.

Various applications are made in order to reduce the thermal load of the building and to save heat. The first of these is the reflective barriers placed on the back of the heat cores. These barriers prevent the heat inside the building from escaping to the outside environment and ensure that the heat is regained inside the building (Figure 4). The second one is made over the windows where the heat escape is the highest. A comprehensive restructuring study was carried out by the construction team in a window factory installed on the building to improve the resistance of 6,514 windows in the building to the transfer of hot and cold air. In this study, the windows were covered with insulating films containing krypton and argon gas. In addition, more than 96% of existing frames and glass are reused, resulting in savings of 70% compared to the cost of new windows (Figure 5).



**Figure 4.** Reflective barriers used in windows (ESRT,2020)



**Figure 5.** Empire State Building window systems (ESRT, 2020)

In addition to the improvements made in the building insulation system, efforts were made to save energy throughout the building. First, various technologies were used to increase the energy efficiency in the building. LED lighting system has been installed to illuminate the spaces and reduce the amount of energy required. Plug load controls have been added to reduce energy from devices that remain on during off hours. Condensate from the building's steam heating system is recycled and reused to heat the water flowing through the taps.

One of the important areas for energy saving in the Empire State Building, which has 102 floors, is the elevators. Regenerative braking system is used to catch the energy wasted while slowing down the descending elevators and to power this energy to the ascending elevators.

Tenant Energy Management software is used in the Empire State Building to support energy saving and sustainability efforts to be accessible and applicable to everyone. Thanks to this software system, all tenants can view their energy expenditures in real time and manage their energy usage (Figure 6), (ESRT, 2020).

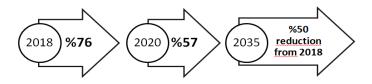


Figure 6. Energy Management (kBtu/ft') (ESRT, 2020)

#### 1.2. Empire State Building and Social Responsibility

Believing that everyone is free, different and talented, building management offers meaningful and effective health and benefit programs that address the mental, physical and social health of the employee and keep pace with changing market practices. In order to evaluate the effectiveness, participation and priorities of employees, studies are developed and improved by monitoring their participation in fitness, health and training opportunities and based on employee feedback.





During the Covid-19 epidemic, the importance of the health and safety of employees, users and managers has been understood once again. At this stage, comprehensive health and safety protocols have been established throughout the building. In this process, emergency response training, mandatory on-site fire safety training and mandatory first aid training were provided to the employees, and a crisis management team was established among the employees.

In the Covid-19 outbreak, some measures have been put in place to support the health of workers as part of the Crisis Response Plan. These measures are:

- -In order to prepare the employees for the possibility of working remotely, the information technology department has carried out various studies and additional equipment has been provided to the employees when necessary. In this way, the transition to working from home has been seamless.
- -In addition to the ongoing virtual question-and-answer sessions with the building CEOs, communication with employees has been increased through the human resources department.
- In June 2020, to ensure the safety of employees returning to their offices, a system was implemented that provides daily active screening for Covid-19 symptoms, allowing employees to access virtual appointments and tests with doctors.
- -An interdepartmental team of employees has been formed to procure cleaning materials, create training content, restructure work areas, comply with social distance requirements and ensure that employees can safely return to the office environment.

For employee health and comfort throughout the building:

Every 3 months, the company provided guidance to employees on nutrition, stress management, disease prevention and healthy living.

- -Common open workspaces have been created with plenty of natural light and ventilation.
- -The desks have been chosen to be ergonomic and suitable for standing use.
- A video conferencing platform suitable for all employees was used to create a sense of community among employees during the work from home process. Many virtual activities such as book clubs, cooking classes, yoga and meditation were organized on this platform (ESRT, 2020).

### 1.3. Empire State Building and Governance

As the Covid-19 virus spread, the building's board of directors frequently received feedback on the impact of the epidemic on employees, users and managers, and introduced various measures to protect their health and safety.

An effective risk monitoring process is maintained by the Board of Directors in order to monitor, evaluate and take action on the important business risks of the company. These risks are physical risks, social risks and transition risks.

Acute weather events and geographic concentration risks determine the physical risks on the structure. Within the scope of the risk process, the Climate Change Adaptation and Resilience Policy and the Climate Change Risk Assessment Checklist were developed for acute weather events. The policy and checklist developed includes potential physical assessments such as power outages, floods, heatwaves, hurricanes and winter storms. Geographical concentration risk is defined as a potential chronic risk that is recognized as natural disasters and long-term changes in the climate

pattern such as sea level rise, where large parts of the building may be rendered inoperable or inaccessible.

Social risks; physical security and terrorism, human health and cybersecurity. Official crisis management plans have been created within the scope of the strategies implemented by the board of directors under the heading of physical security and terrorism. While personal electronic surveillance is provided at all entry points, employees and managers are provided with training on protection against active sniper, biological, nuclear, chemical and radiological weapons.

Various applications are implemented for human health. Annual inspections of indoor air quality, which is an important risk factor for human health, are carried out. In these tests, regular checks are also made to ensure that the pollutants remain below the lowest acceptable levels. In addition, bipolar ionization air purification technology is used in order to provide the desired conditions in air quality in terms of performance. As mentioned before, this system can neutralize 99.92% of coronaviruses in the air.

Within cyber security; firewall, penetration tests, cyber security insurance, in-company employee trainings for protecting personal data and information, cyber security department in the customized structure within the scope of cyber security, cyber training modules and new cyber security tools are evaluated.

Transition risks cover policy risks, technology risks and market risks. In policy risks, the carbon footprint of the building is evaluated, the energy and climate regulations in the regions and cities where the building operates, especially the NYC Climate Mobilization Law.

In technology risks; Innovative technologies to reduce climate-related risks are evaluated. Examples include advanced optimization and machine learning technologies, battery storage, renewable energy use, lighting systems and their controls, building management systems, socket loads of equipment and employees and their controls.

In market risks; Sudden and unexpected changes in energy costs and market perceptions are evaluated by investors. Long-term contracts are planned for certainty, predictability and risk reduction in utility pricing (ESRT, 2020).

## **CONCLUSION:**

Many structures in which we live, and the functioning of various institutions and organizations lack emergency plans, necessary precautions and preparations. Although these structures have been renewing themselves in the titles of energy use and renewable energy sources for a long time, there are still deficiencies in the titles of building and user health. The WELL Healthy Building Standard is actually important for the health of building users and future generations.

The Covid-19 outbreak has shown the entire world that we have shortcomings to build design and user health, and that we need to be prepared for any crisis that may occur. One of the building groups most affected by this crisis has been commercial spaces. Even the world's leading commercial centers such as the Empire State Building went into short-term closure in order to protect the health of their employees, managers and users during the pandemic process. However, some buildings have turned this situation into an advantage, identified their own shortcomings and taken new steps in the titles of user and building health, and carried out various studies on their structures. In particular, the WELL Covid-19 Health Safety Rating has become an exemplary model for building designers, while it has strengthened the responsibility-trust relationship between managers, employees and users.



Table 2. Comparison of WELL Covid-19 Health Safety Rating and Empire State Building

WELL Covid-19 Health Safety Rating		Empire State Building
Cleaning and Sanitization Procedures Features	SC1 Support handwashing	Use of special fixtures
	SC5 Reduce respiratory particle exposure	Bipolar ionization system
Emergency Preparedness Programs	SE1 Develop emergency preparedness plan	-Creation of Crisis Response Plan -Establishment of the risk surveillance process -Creation of Crisis Management Plan
	SE2 Create business continuity plan	-Providing employees with additional equipment -Conducting information technology studies for remote working environment -Organization of virtual question-answer sessions
Health Service Resources	SH2 Provide health benefits	-Organization of virtual appointments with doctors -Health system that monitors Covid-19 symptoms daily
	SH3 Support mental health recovery	-Video conference platform (Book club, yoga, cooking classes, etc.)
Air and Water Quality Management	SA1 Assess ventilation	Bipolar ionization system
	SA2 Assess and maintain air treatment systems	<ul><li>- Indoor air quality tests</li><li>-CO2 sensors</li><li>-Pest management strategies</li><li>-Air filters</li></ul>



	SA4 Monitor air and water quality	-Water efficiency strategies  -Meters / sub-meters used in the water system  - Artificial intelligence software for monitoring water use
	SA5 Manage mold and moisture	-Bipolar ionization system  Using special air filters
Stakeholder Engagement and Communication	SS1 Promote health and well-being	-Tenant Energy Management software  -Health and safety procedures  -Organization of various trainings (stress management, prevention from diseases, healthy life, etc.)
	SS2 Share food inspection information	Organizing trainings on healthy nutrition
Innovation	Innovation I	-Reflective barriers integrated into the heat pads -Rearrangement of windows -Addition of plug load controls for electrical loads -Reuse of condensate water -Using regenerative braking system in elevators -Inspection of equipment and employees' socket loads

The Empire State Building has made important studies for the WELL Covid-19 Healthy Building Certificate as both the management and the building design team. As a result of the analyzes made based on the information obtained, a new application was put into operation for almost every category, while at the same time, new suggestions were made that were not included in the certificate. Even a building such as the Empire State Building with a large building mass and a high density of both the user and the workforce has become suitable for the health of its structure and its user as a result of the right interventions where necessary.

What needs to be done in order to protect the health of the building and the user is the correct analysis of the structures. With the structural analysis, the concrete studies can be started by determining the potential areas suitable for change, maintenance and repair on the structure. Applying the right materials and construction techniques in these works will increase their effectiveness. In addition to the work to be done on the building system, studies on building management should also be carried out. In particular, emergency preparedness plans in which the determined strategies and procedures can be applied, trainings that can be given to the building user, employees and managers, and new opportunities to be offered are important.

In order to create more sustainable, healthy environments and prevent pandemics, the WELL Covid-19 Healthy Building Certificate system should be implemented in all existing and new buildings, as well as at the city level. Different types of buildings such as offices, residences, shopping malls, cafes and restaurants, quarantine centers, hospitals, educational institutions, where people spend most of their daily lives, should be handled and evaluated separately within the certificate system in order for the application to give accurate results and operate systematically. In addition, the building systems and scopes of the buildings should be considered in the evaluation. In this context, various studies and arrangements should be made on the WELL Covid-19 Healthy Building Certificate, and as a result, a rating system should be established. National and international premiums and incentives should be arranged according to the degree levels to be determined.

The certification system provides Turkey, America, UN, World Health Organization and other international pandemic standards. For this reason, the certification system can be widely used on a global scale by integrating the existing standards and practices of each country in a short time. Within the framework of the relevant standards and regulations, the WELL Covid-19 Healthy Building Certification system can be adapted and effectively applied for Turkey, with the effective work of expert health personnel, academics, architects, engineers, investors, local governments and relevant ministries.

# **Compliance with Ethical Standard**

**Conflict of Interests:** There is no conflict of interest between the authors.

Ethics Committee Approval: Ethics committee approval is not required for this study.

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