

Presentation 1: Sustainability in Mechatronics

We identified that sustainability is a crucial concept in the field of mechatronics, encompassing energy efficiency, renewable energy integration, materials selection and lifecycle analysis, waste reduction and recycling, and social considerations. However, there was a lack of a clear roadmap on how to implement sustainability principles in the design, manufacturing, operation, and disposal processes of mechatronic systems.

Issue

We identified that sustainability is a crucial concept in the field of mechatronics, encompassing energy efficiency, renewable energy integration, materials selection and lifecycle analysis, waste reduction and recycling, and social considerations. However, there was a lack of a clear roadmap on how to implement sustainability principles in the design, manufacturing, operation, and disposal processes of mechatronic systems.

Solution

We addressed this issue by detailing how sustainability can be achieved in mechatronic systems. We proposed optimizing power consumption, utilizing energy-saving components, and implementing efficient control algorithms to enhance energy efficiency. We also suggested integrating renewable energy sources, selecting environmentally friendly and recyclable materials, implementing waste reduction strategies, and considering social impacts in our designs.

By integrating sustainability principles into mechatronics engineering practices, we can create innovative solutions that are environmentally responsible, socially beneficial, and economically viable over the long term. This approach ensures that we meet current needs without compromising the ability of future generations to meet their own needs.

Presentation 2: Redesigning a Plastic Bottle Cap

We discovered that traditional PET bottle caps have issues with odor and taste transmission, recyclability, and ergonomics. These problems negatively impact consumer perception of product quality and contribute to environmental pollution.

Issue

We discovered that traditional PET bottle caps have issues with odor and taste transmission, recyclability, and ergonomics. These problems negatively impact consumer perception of product quality and contribute to environmental pollution.

Solution

We tackled these issues by presenting strategies for redesigning PET bottle caps. We improved ergonomics to make the caps easier to open. To address recyclability concerns, we proposed using biodegradable materials, highlighting their reduced environmental

impact. We also focused on minimizing odor and taste transmission by carefully selecting materials and optimizing the design.

Our redesigned PET bottle caps offer a more user-friendly experience, reduce environmental impact, and ensure better product quality. These improvements contribute to increased consumer satisfaction and a more sustainable approach to packaging.

Presentation 3: Tourette's Syndrome

We recognized that Tourette syndrome is a combined motor and vocal tic disorder that begins in childhood and takes a chronic course. Treating this syndrome is challenging because tics cannot be prevented or postponed, and treatment effectiveness varies among individuals.

Issue

We recognized that Tourette syndrome is a combined motor and vocal tic disorder that begins in childhood and takes a chronic course. Treating this syndrome is challenging because tics cannot be prevented or postponed, and treatment effectiveness varies among individuals.

Solution

We approached this issue by discussing the various treatment methods available for Tourette syndrome and how they can improve the quality of life for patients. We explored medication options, behavior therapy, and deep brain stimulation as potential treatments. Additionally, we emphasized the importance of support devices and increasing societal awareness to help patients manage their daily lives better.

Through a comprehensive approach that includes medication, therapy, and societal support, we aim to enhance the quality of life for individuals with Tourette syndrome. Each patient's journey is unique, and a personalized treatment plan is essential for effective management of the condition.

“HOW TO REDESIGN A PLASTIC BOTTLE CAP?”



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ERGONOMICS



How can
we open
the normal
PET bottle
?

MATERIAL



- How many time can a PET bottle and a bottle cap RECYCLE?
- What if it couldnt recycle and ends up in the ground?

SMELL AND TASTE TRANSMISSION

PROBLEM IN CLASSIC PET BOTTLE CAPS:

- Smell and taste issues in traditional PET bottle caps occur when the bottle emits odors or flavors, or when external factors impact the contents.
- Causes include the type of material used for the cap, design mistakes, and chemical reactions with the contents.
- This problem not only affects consumers negatively but also raises concerns about product quality and reliability.



REASONS WHY PEOPLE DON'T DRINK WATER:

- Lack of awareness
- Habits
- Lack of thirst sensation
- Taste preference
- Busy lifestyle
- Health conditions

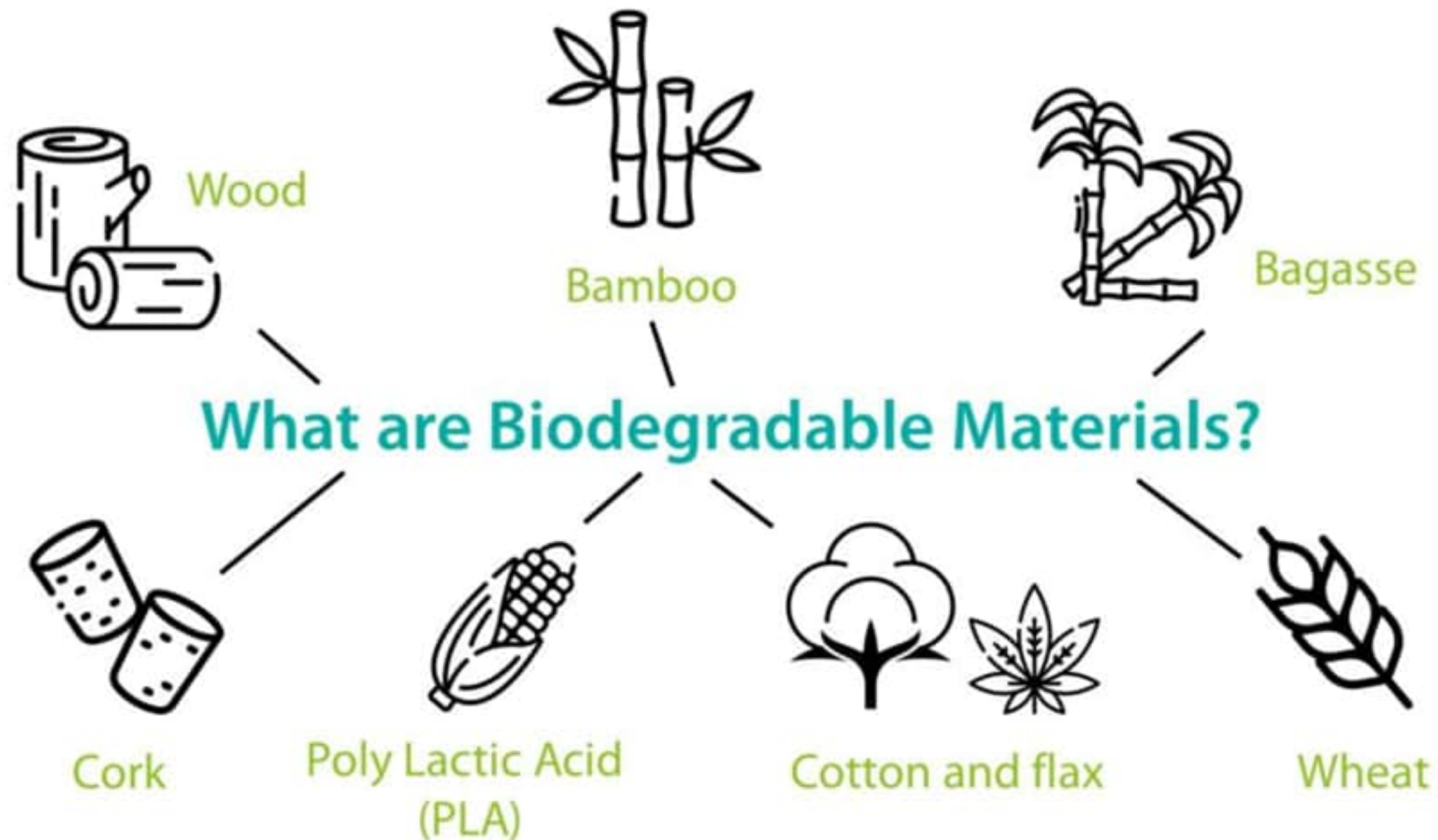


How much water you should drink a day



Body weight	Water
45 kgs	1.9 Ltrs.
50 kgs	2.1 Ltrs.
55 kgs	2.3 Ltrs.
60 kgs	2.5 Ltrs.
65 kgs	2.7 Ltrs.
70 kgs	2.9 Ltrs.
75 kgs	3.2 Ltrs.
80 kgs	3.5 Ltrs.
85 kgs	3.7 Ltrs.
90 kgs	3.9 Ltrs.
95 kgs	4.1 Ltrs.
100 kgs	4.3 Ltrs.

WHAT IS A BIODEGRADABLE MATERIAL?



FLAVOR THAT TOUCHES THE NATURE

Traditional PET bottles causes;

- Petroleum raw material.
- Long time of dissolution.
- Increase of pollution.



Biodegradable PET bottles causes;

- Renewable raw material.
- Short time of dissolution.
- Decrease of pollution.

RECYCLING AND THE GREEN ECONOMY

The cost of a regular PET bottle is between 0.20 TL and 0.30 TL, while the cost of a bottle cap made from biodegradable material is between 0.30 TL and 0.50 TL.



ERGONOMICS AND TASTE ISSUES



1. Ergonomic Design:

- User-friendly: People of all ages and abilities can use it easily.
- Innovative on/off mechanism: Makes it easy to use.

2. Flavoring Feature:

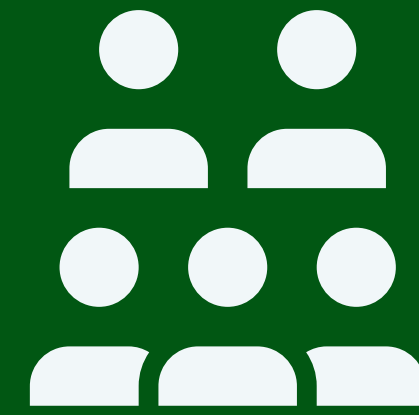
- Natural flavors: Provides natural fruit flavors when drinking water.
- Health and flavor: Makes water more appealing without added sugar.

3. User Experience:

- Enriches the drinking experience: Promotes healthy living by increasing water consumption.
- Variety: Provides users with different taste options.



TARGET AUDIENCE

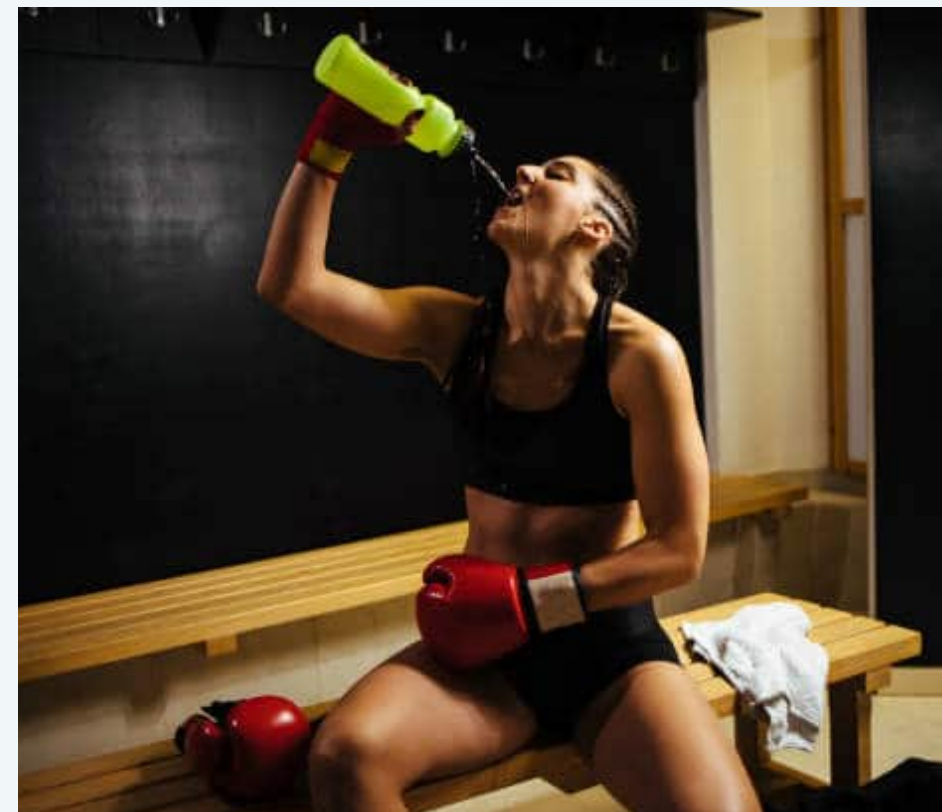


HOW DO WE EXPAND OUR TARGET AUDIENCE?

MEDICAL

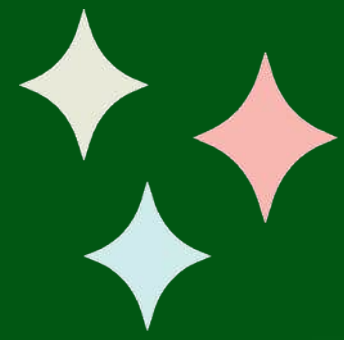


SPORTS

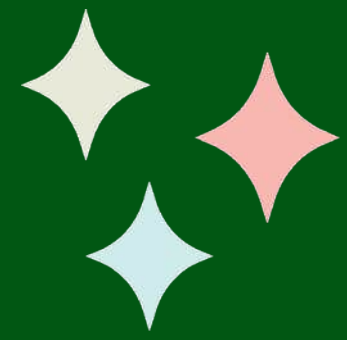


ENTERTAINMENT

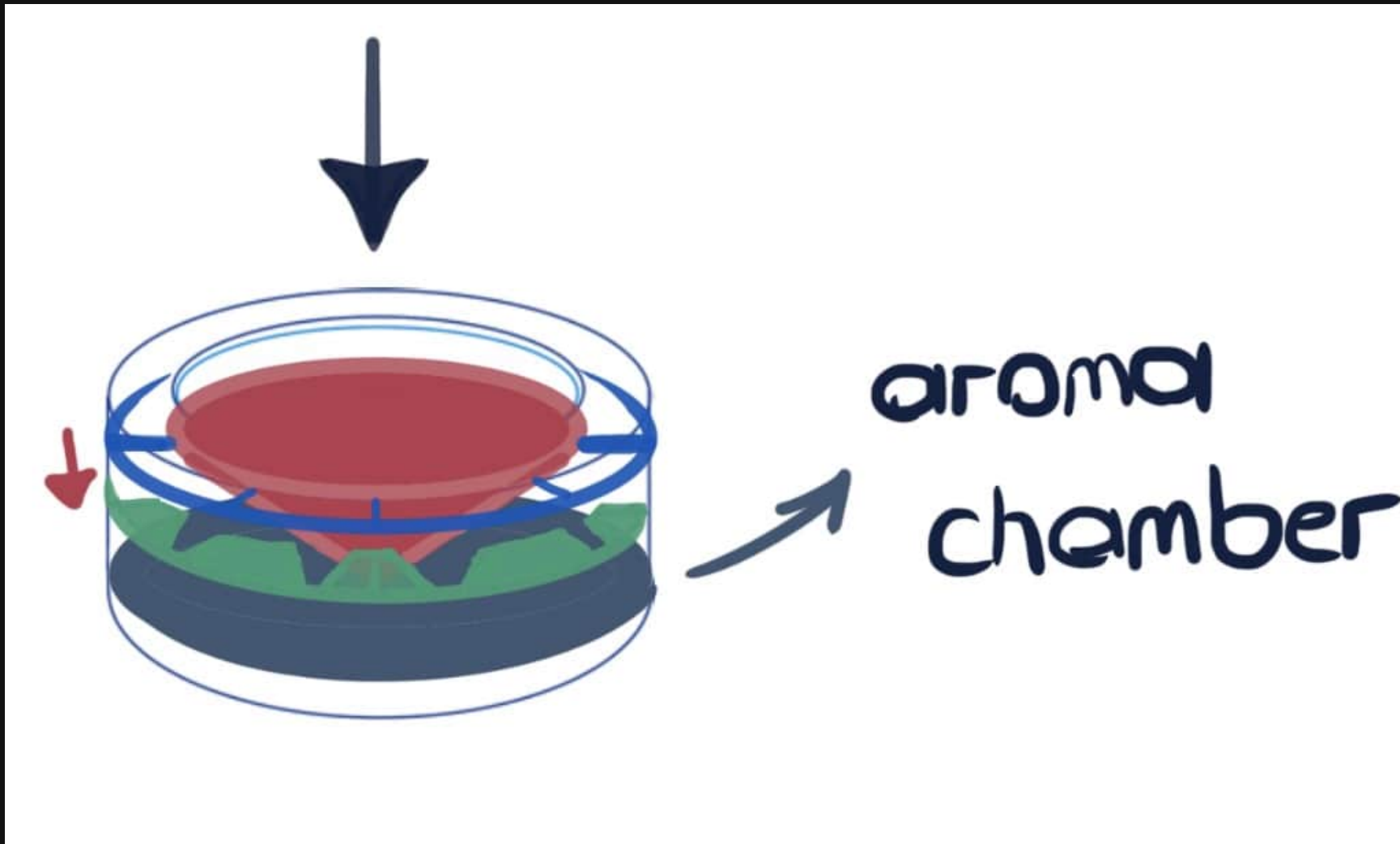




AND OUR DESIGN



INTERIOR DESIGN



THANK
YOU FOR
YOUR
INTEREST

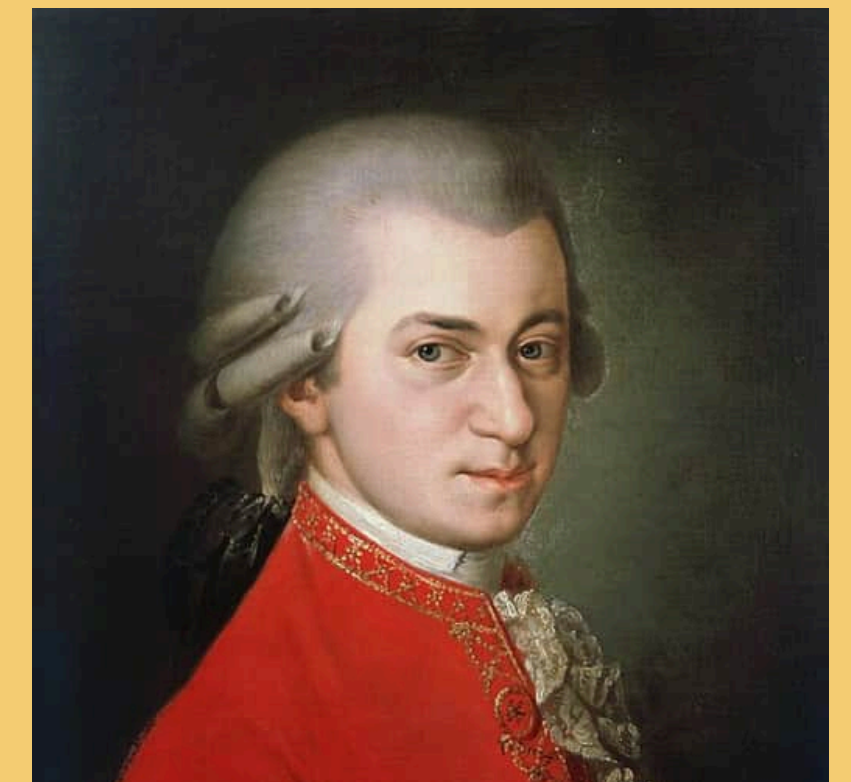
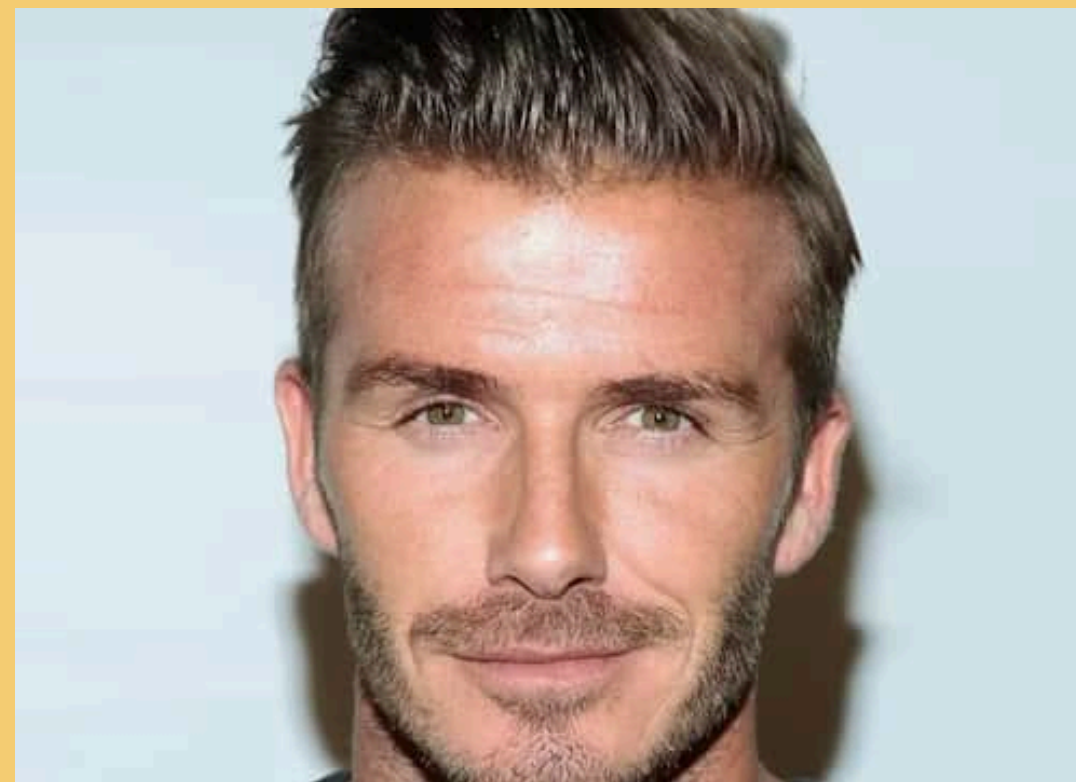
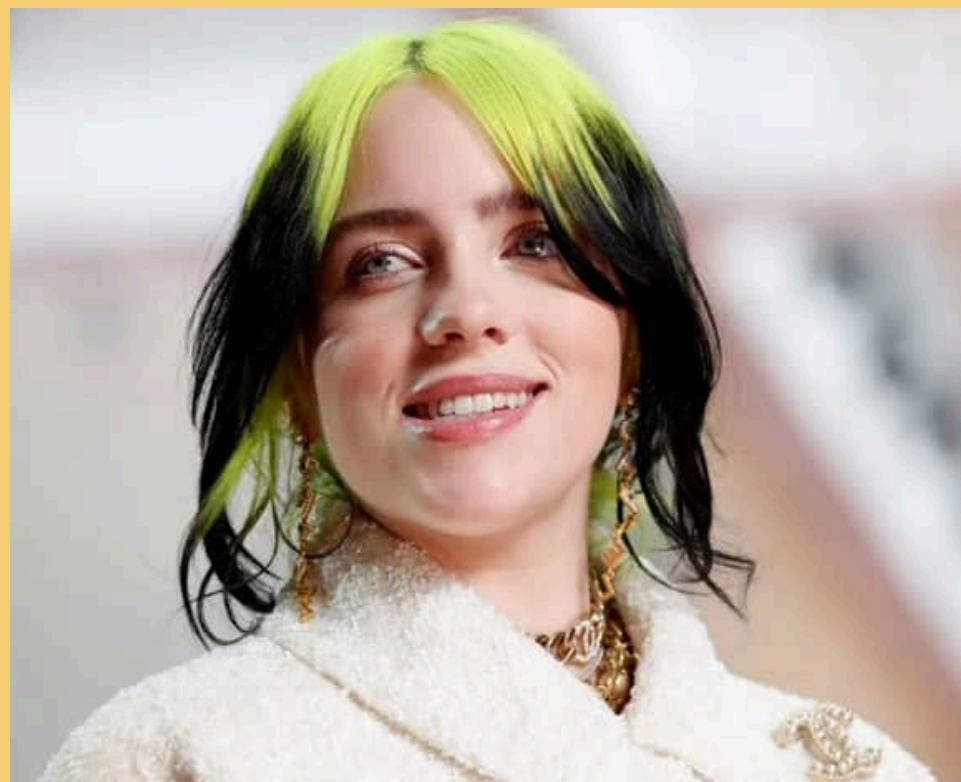


FOR TOURETTE'S

Berke Parlat
Furkan Karadavut
Eda Meltem Dolu
Irem Uzun
Mehmet Can Demir
Muhsine Ozer
Tolgahan Gergin

TOURETTE'S SYNDROME

Tourette syndrome is a combined motor and vocal tic disorder that begins in childhood and takes a chronic course.



What is the treatment ?

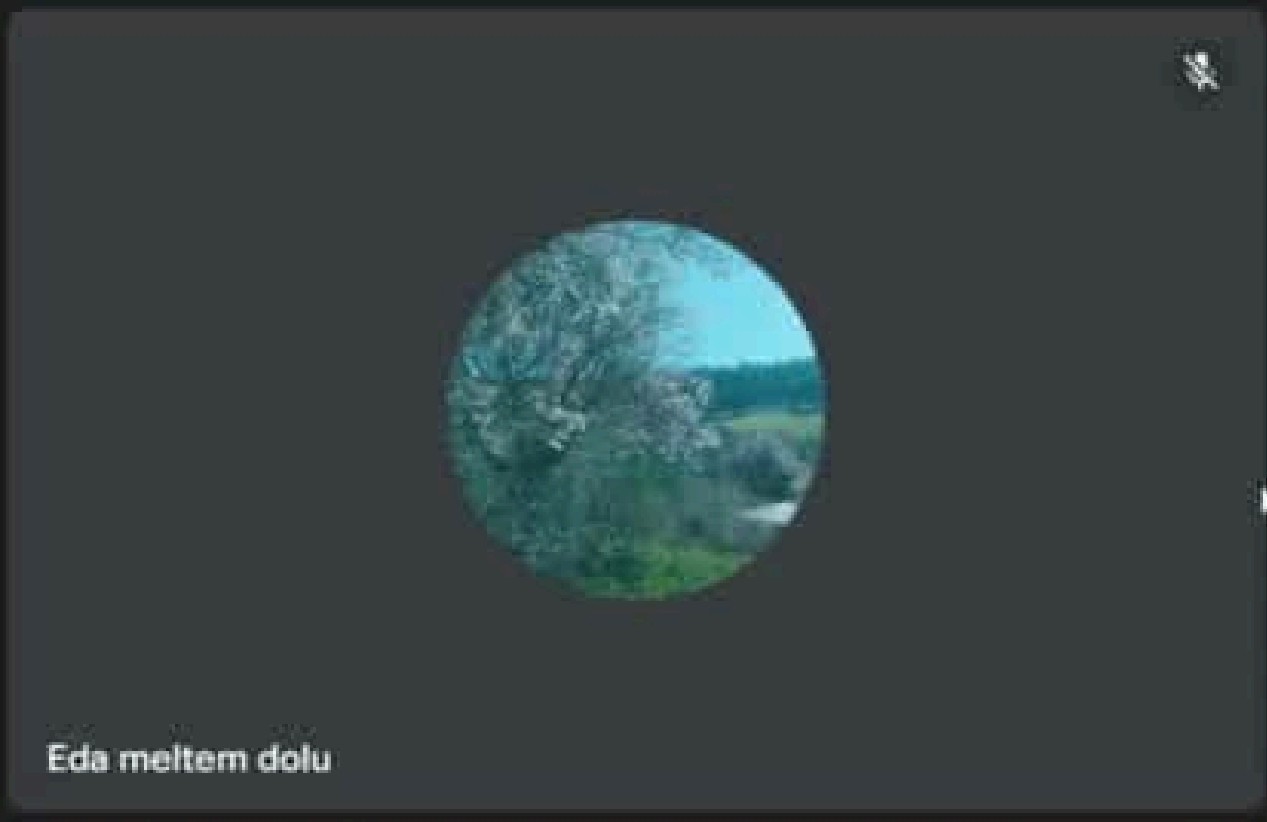
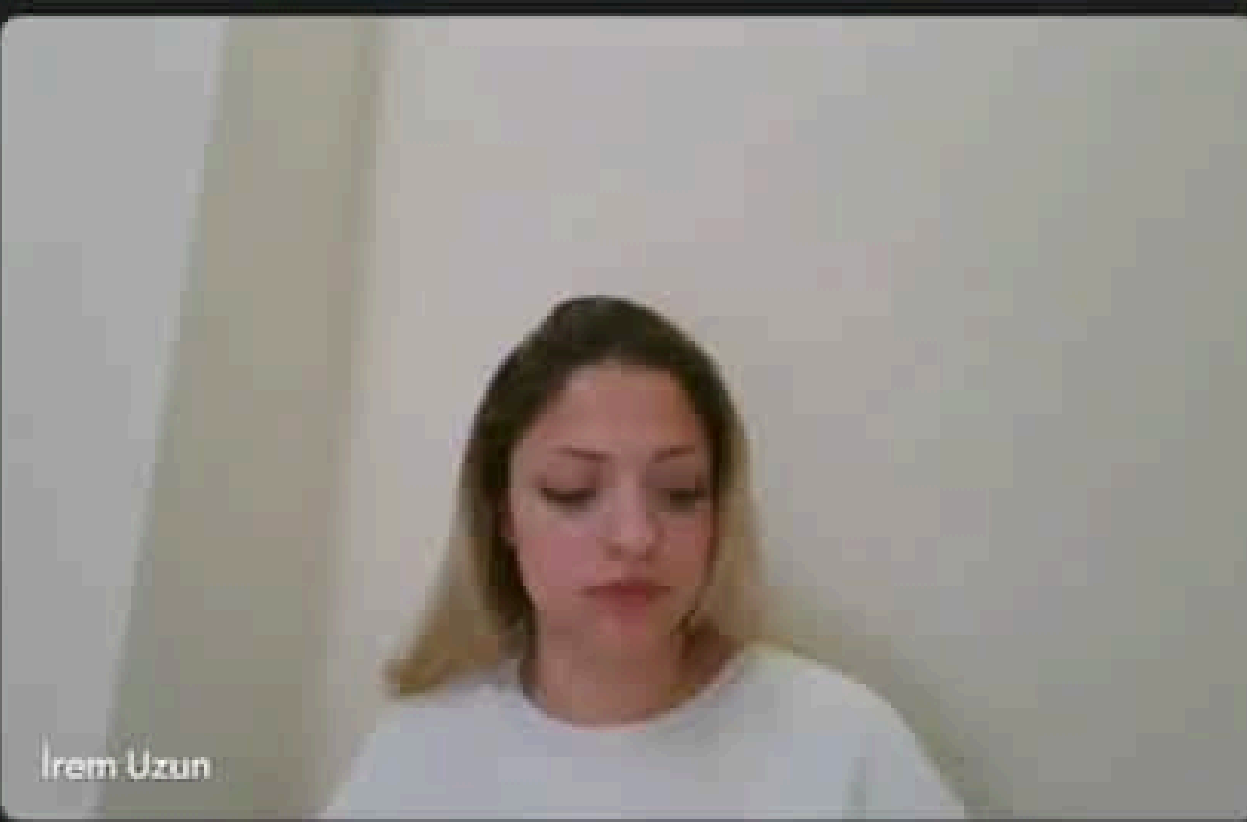
MEDICATION

- Medications that block or lessen dopamine.
- ADHD medications
- Botulinum (Botox) injections
- Central adrenergic inhibitors
- Antidepressants
- Antiseizure medications

THERAPY

- Behavior therapy
- Psychotherapy
- Deep brain stimulation (DBS)

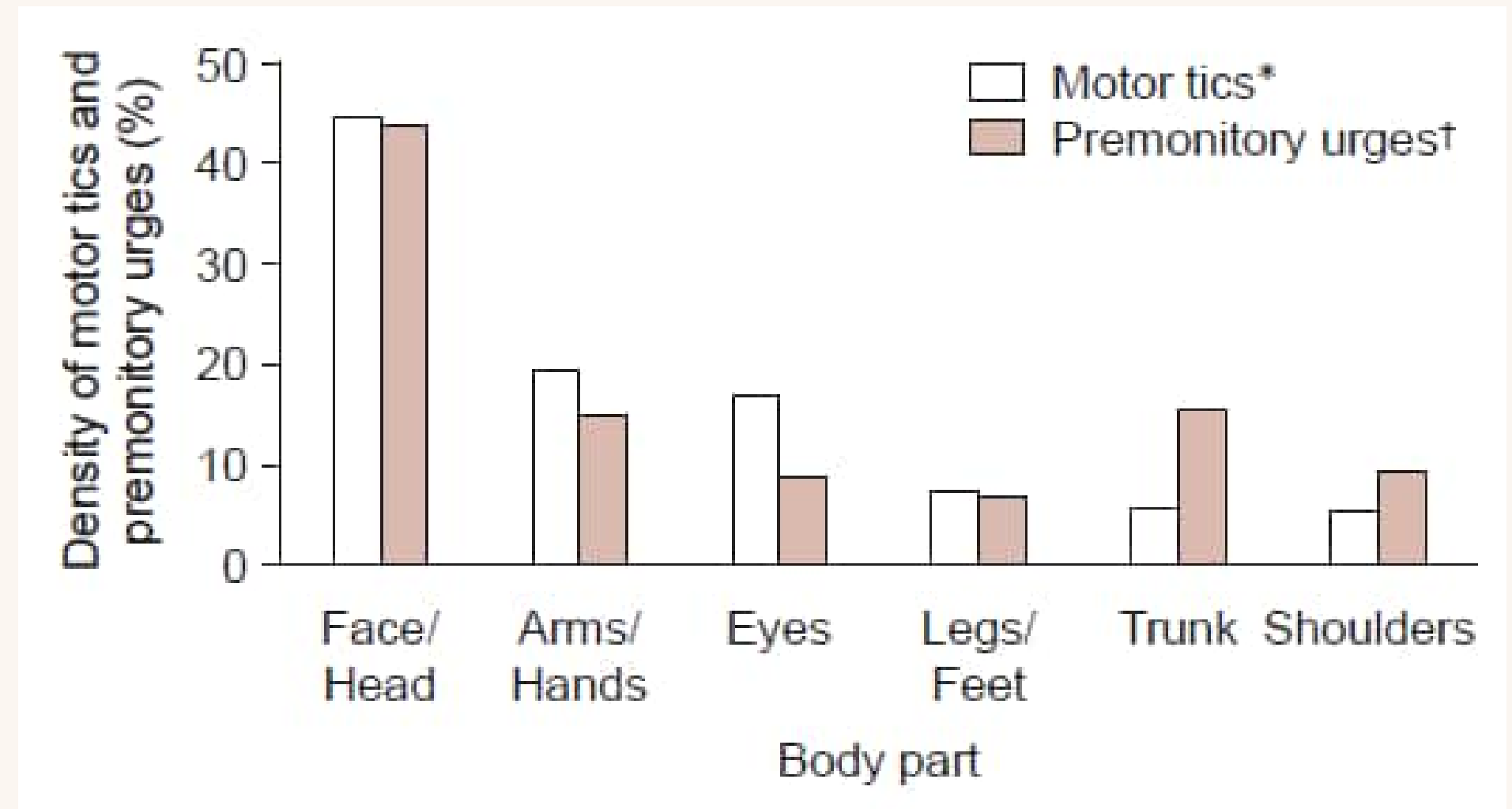
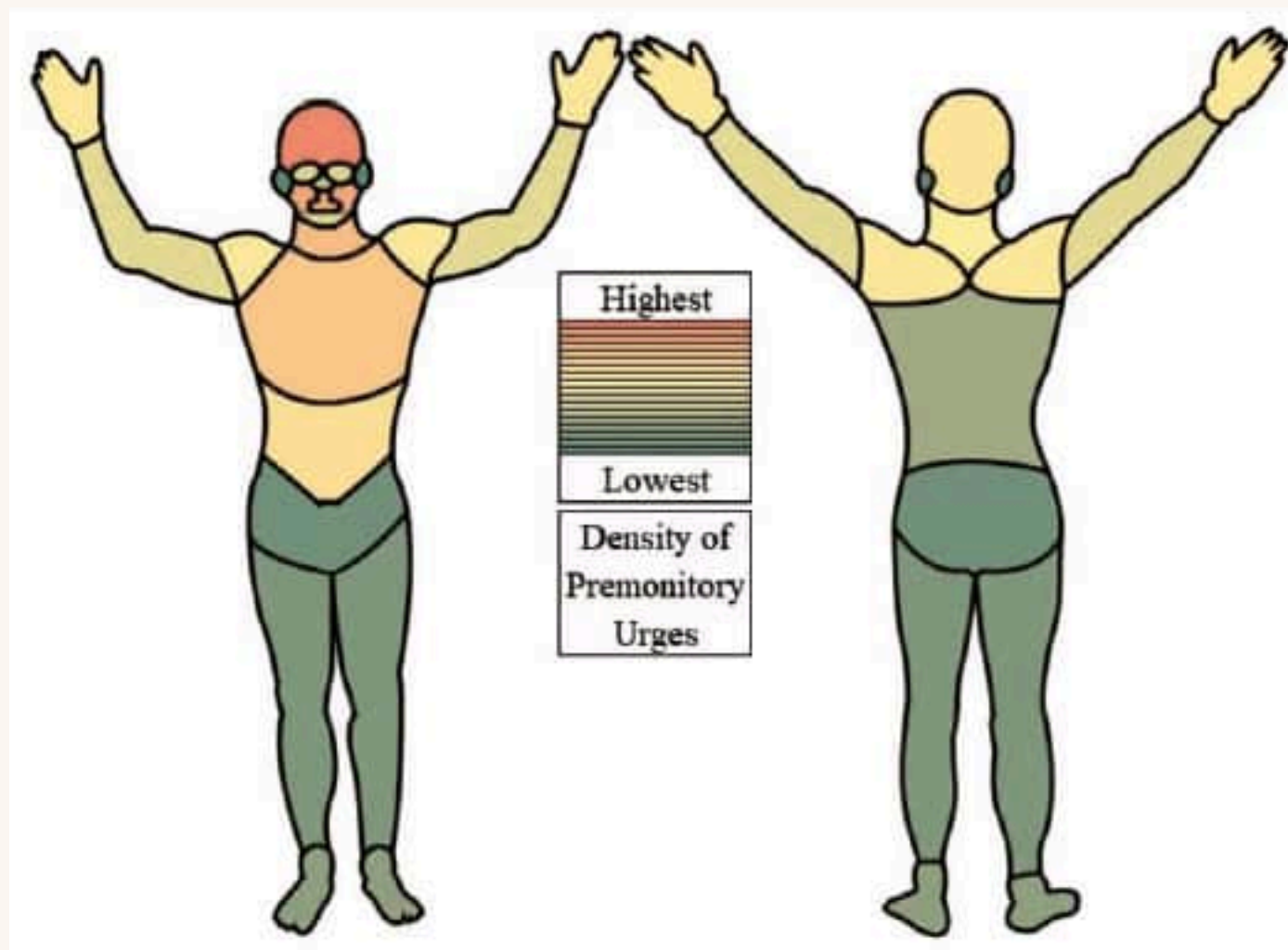
- Tics cannot be prevented or postponed
- Any treatment works for everyone.
- Every tourette person's journey is unique



So...

Improve the quality of
life

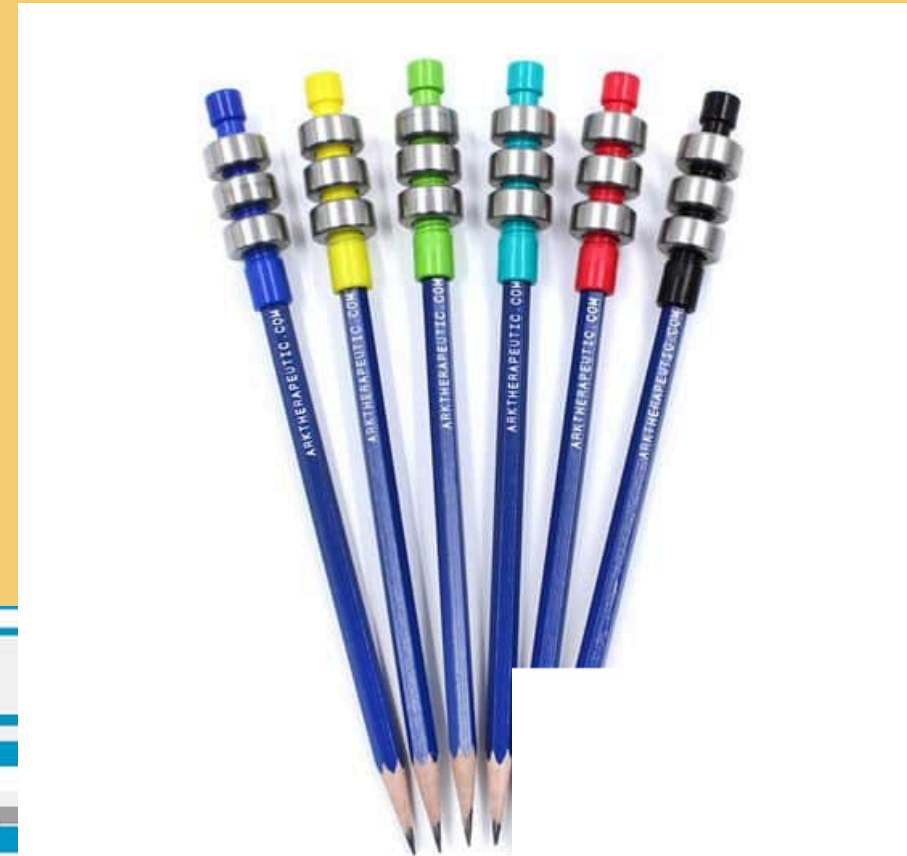
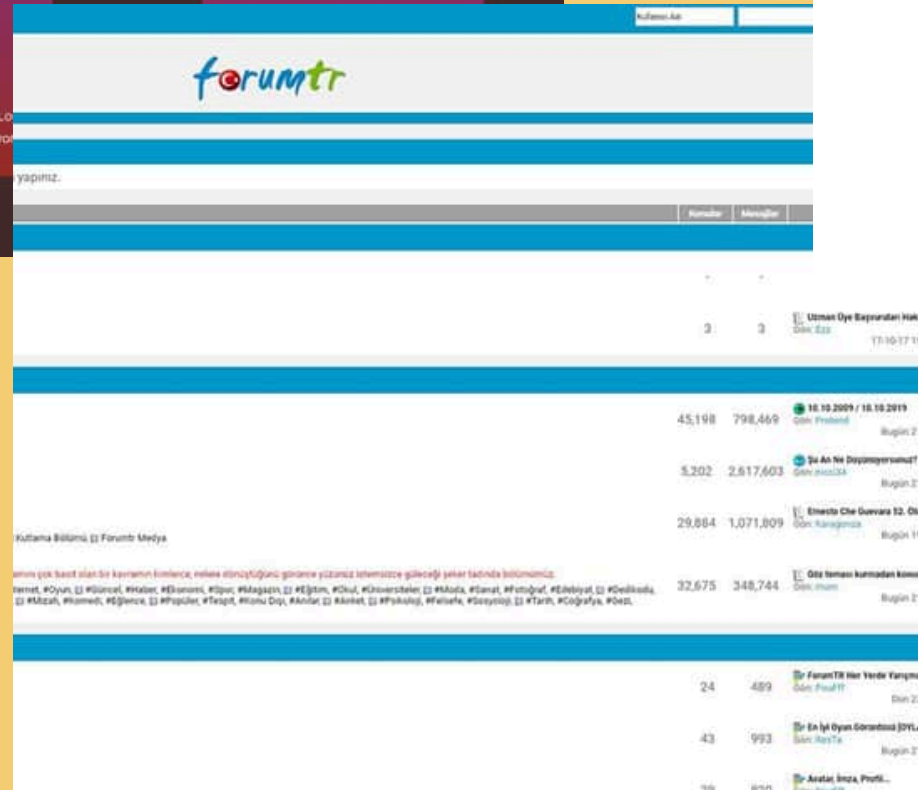
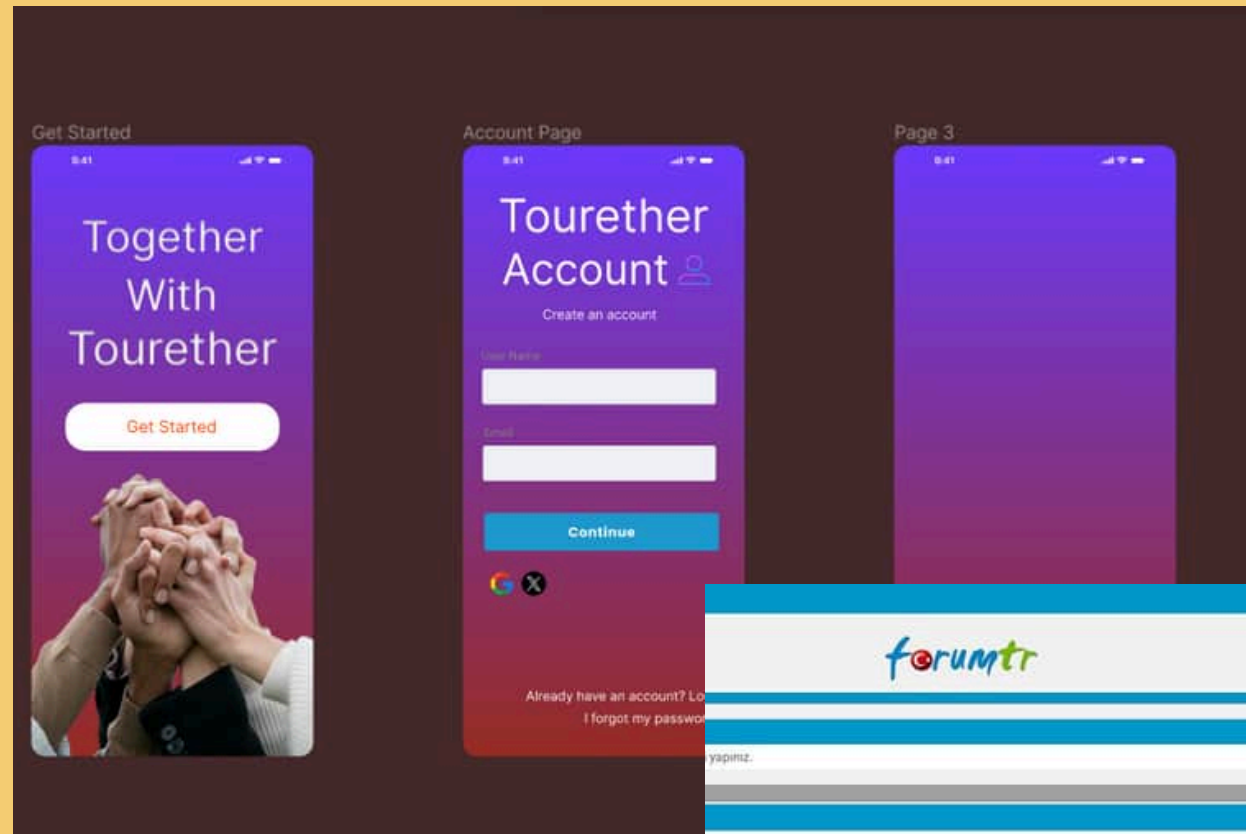
Density of premonitory urges (PU) for all tics



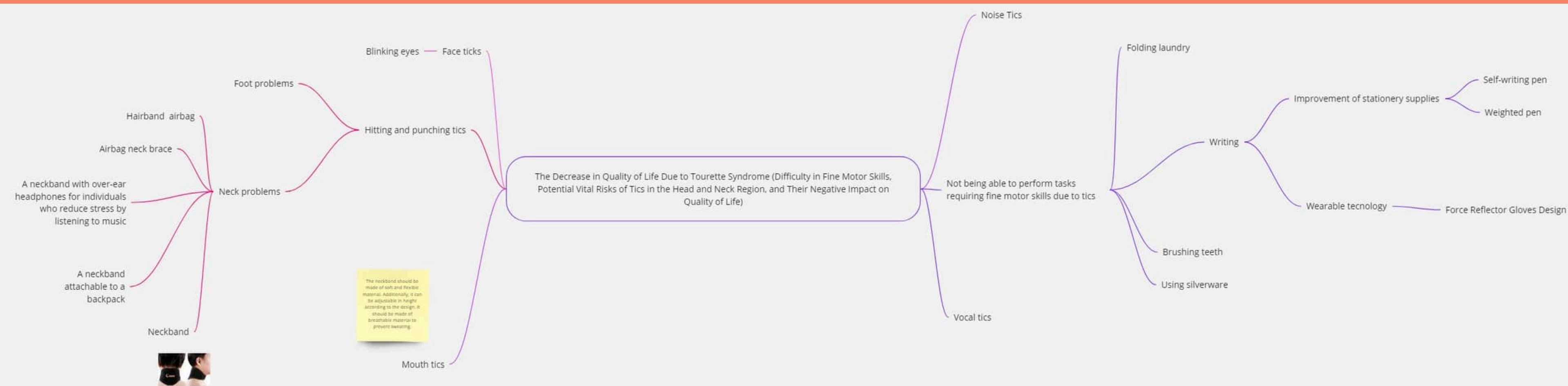
*Premonitory Urges Reconsidered: Urge Location Corresponds to Tic Location in Patients With Primary Tic Disorders
Jana Essing¹, Ewgeni Jakubovski¹, Nikolas Psathakis¹, Sinan N Cevirme², James F Leckman³, Kirsten R Müller-Vahl¹
<https://e-jmd.org/journal/view.php?doi=10.14802/jmd.21045>

BRAINSTORMING

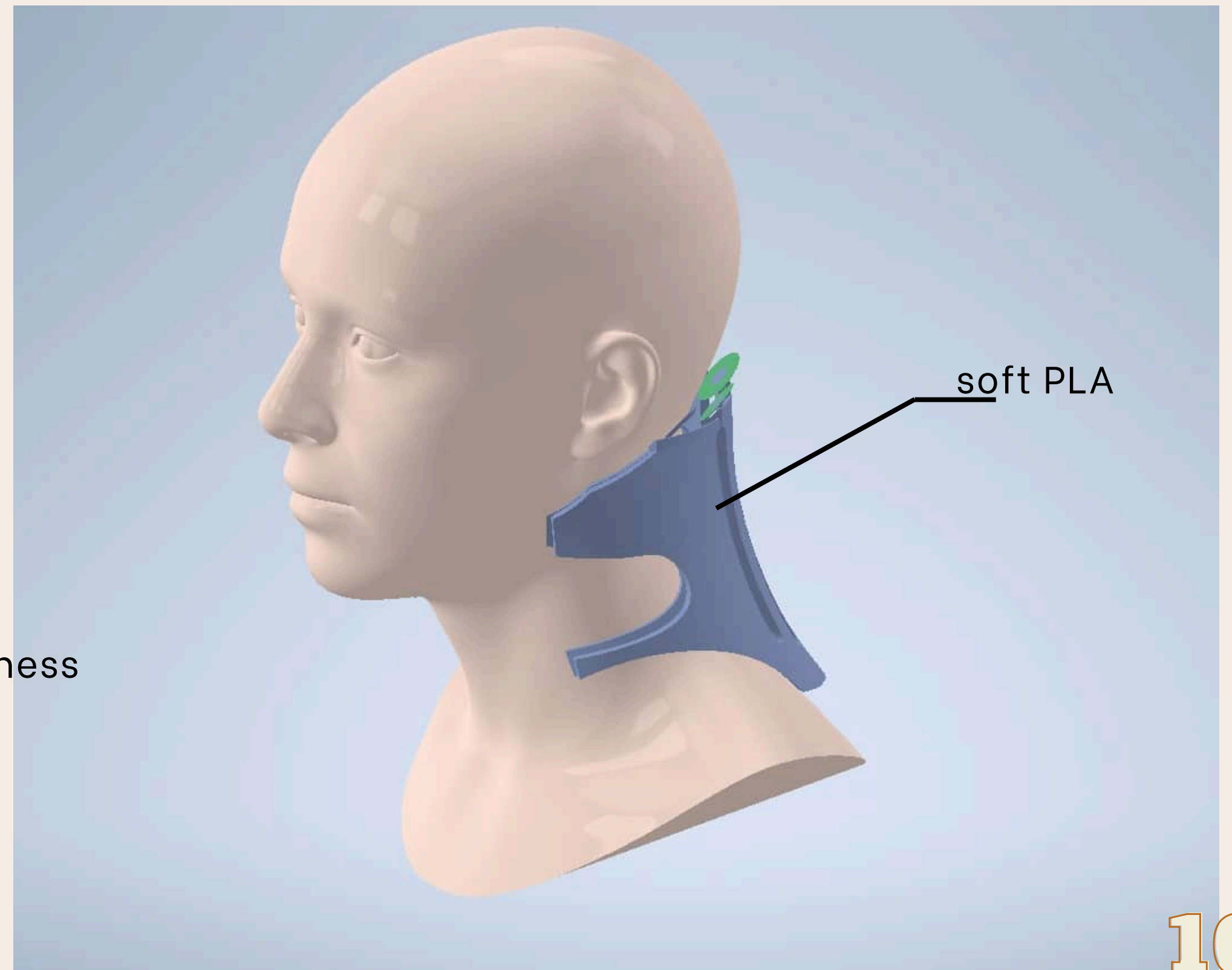
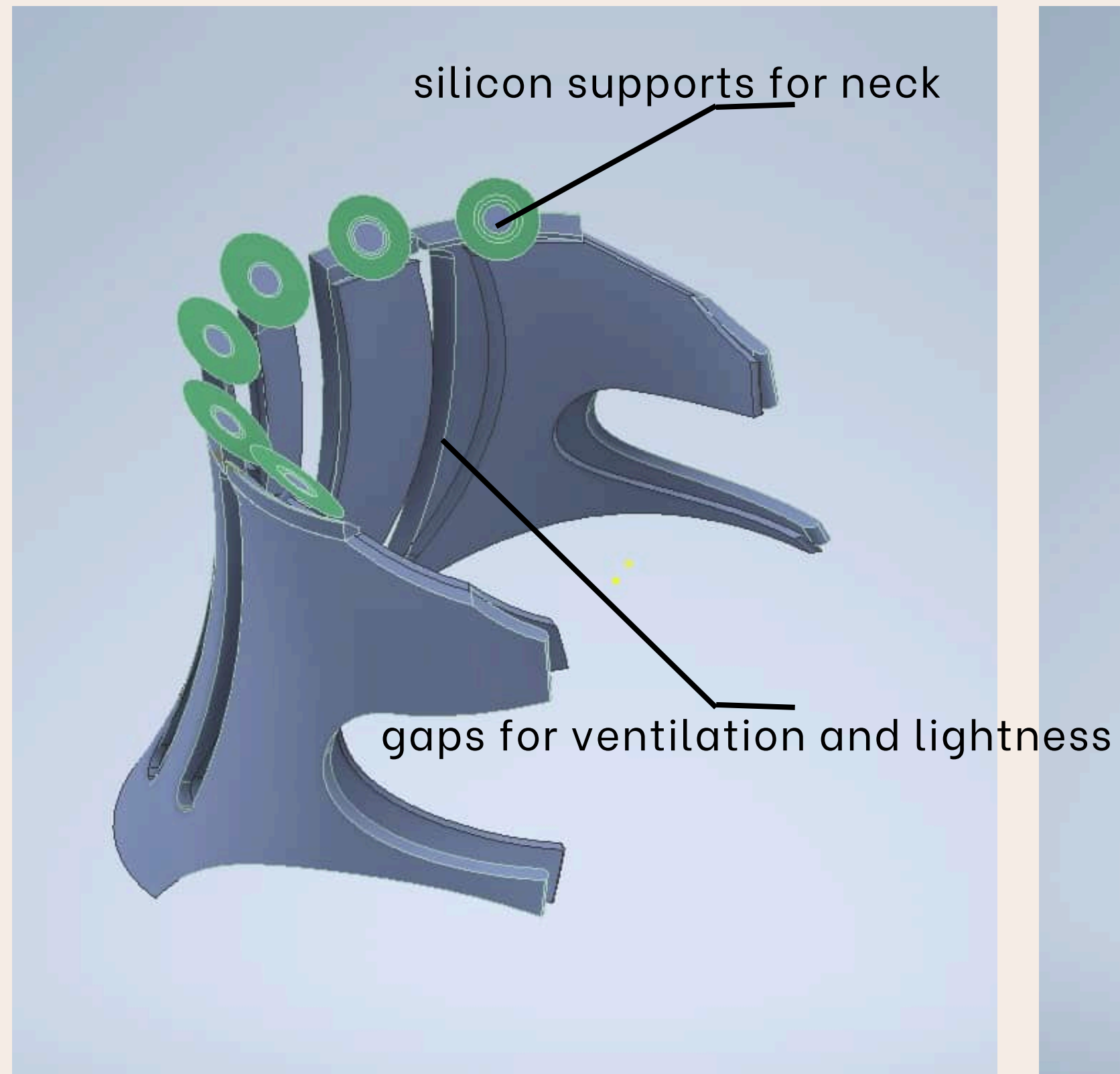
Techniques and Tools for Generating Ideas

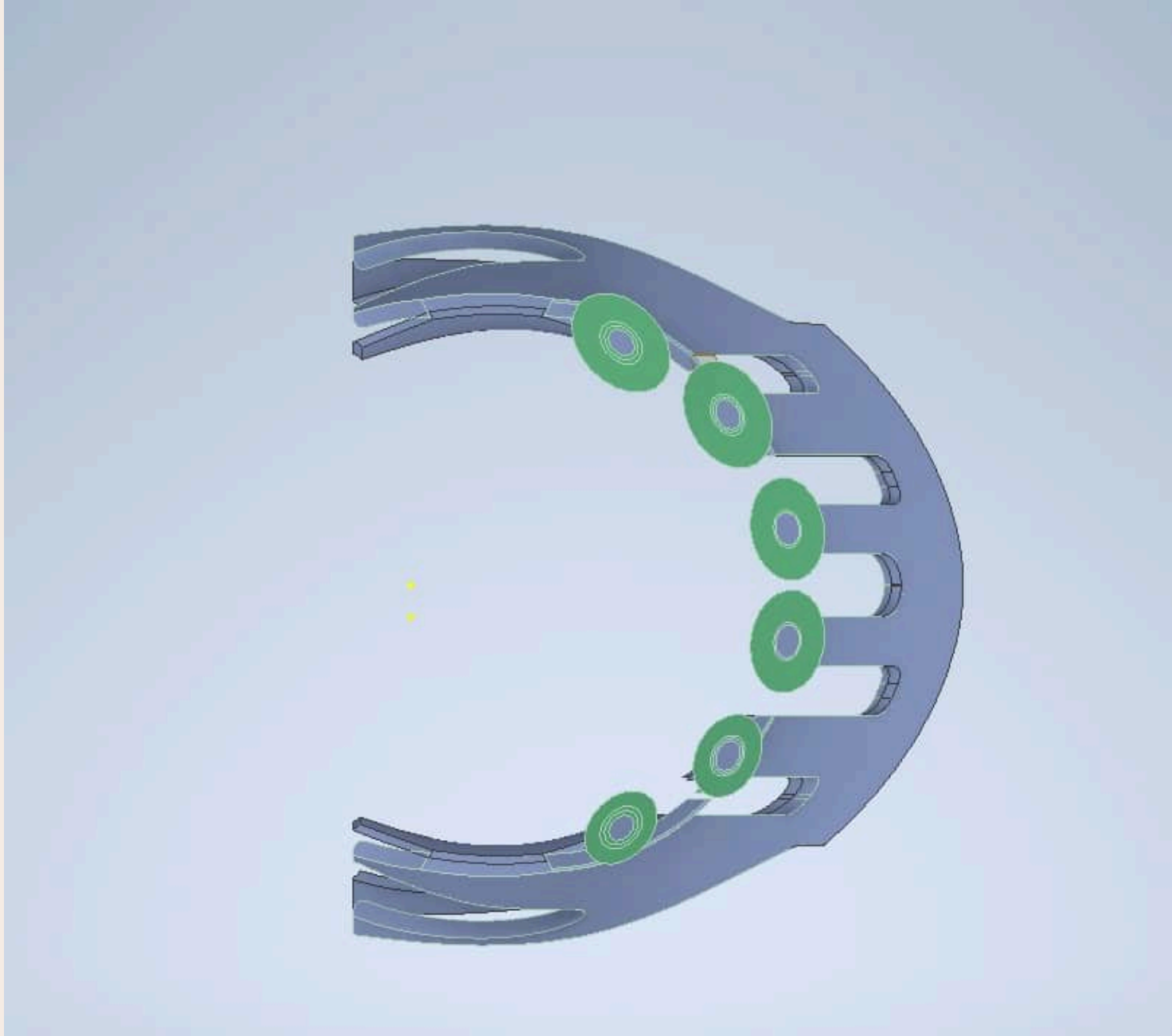


MIND MAP



Protect the Neck!



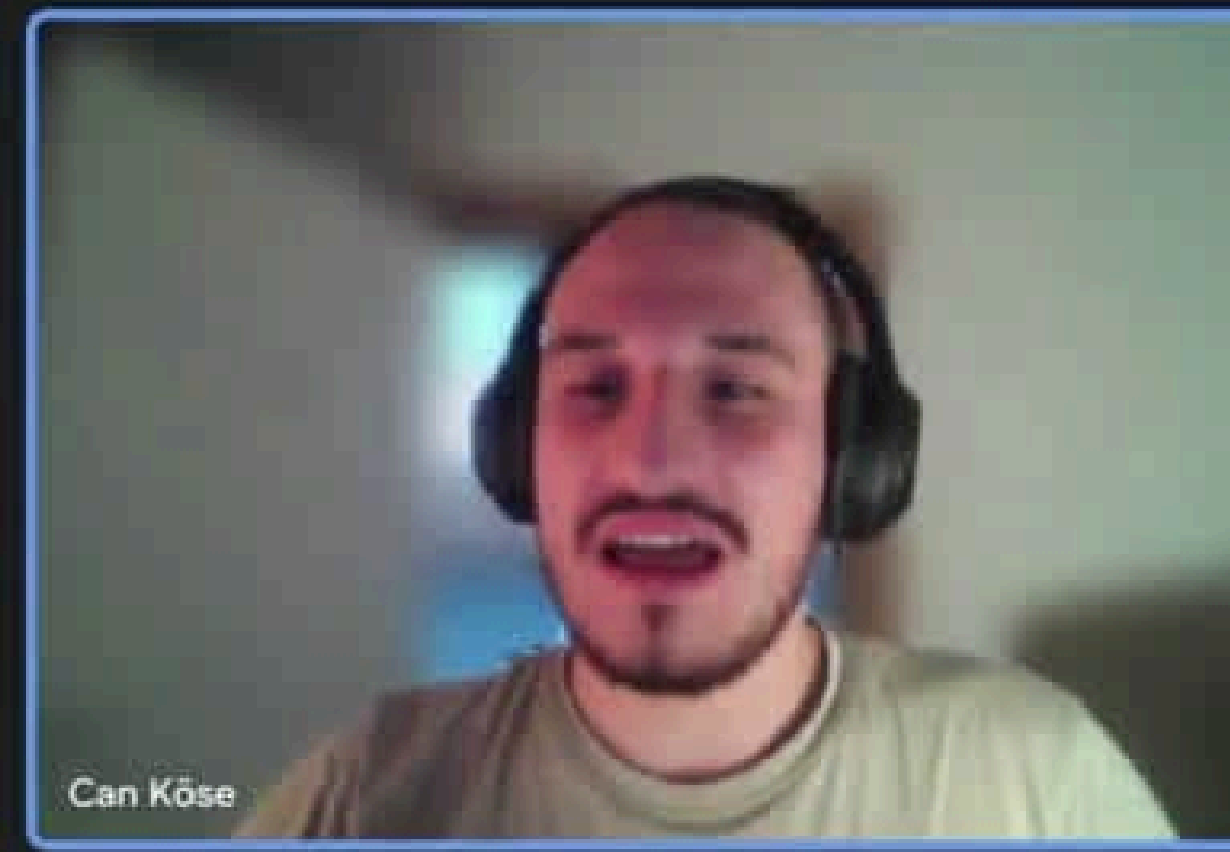


**You can reach the full
interview video from here!**



**Can Köse
Türkiye Tic and Tourette
Syndrome Volunteer**





**I have Tourette
but Tourette doesn't have me
-Can Köse**



THANK YOU
VERY MUCH!

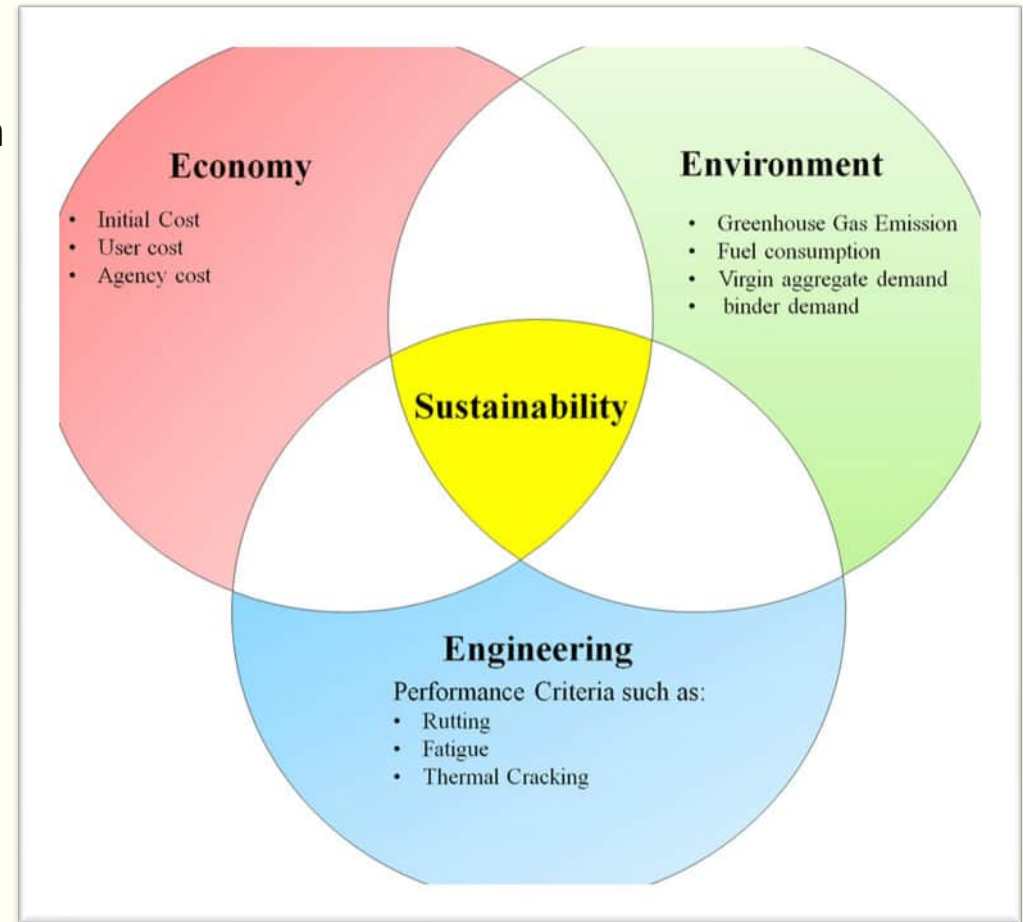


WHAT IS SUSTAINABILITY IN MECHATRONICS?



Introduction

Sustainability in mechatronics refers to the application of sustainable principles and practices within the field of mechatronics engineering. Mechatronics is an interdisciplinary field that combines elements of mechanical, electrical, and computer engineering, and sustainability principles are integrated into various aspects of its design, manufacturing, operation, and disposal processes. Sustainability in mechatronics is examined under 6 different headings.



1. Energy Efficiency:

Designing mechatronic systems with a focus on energy efficiency is crucial for sustainability. This includes optimizing power consumption, utilizing energy-saving components, and implementing efficient control algorithms to minimize energy waste during operation.



2. Renewable Energy Integration

Incorporating renewable energy sources, such as solar or wind power, into mechatronic systems can enhance sustainability by reducing reliance on non-renewable resources and lowering greenhouse gas emissions.



3. Materials Selection and Lifecycle Analysis

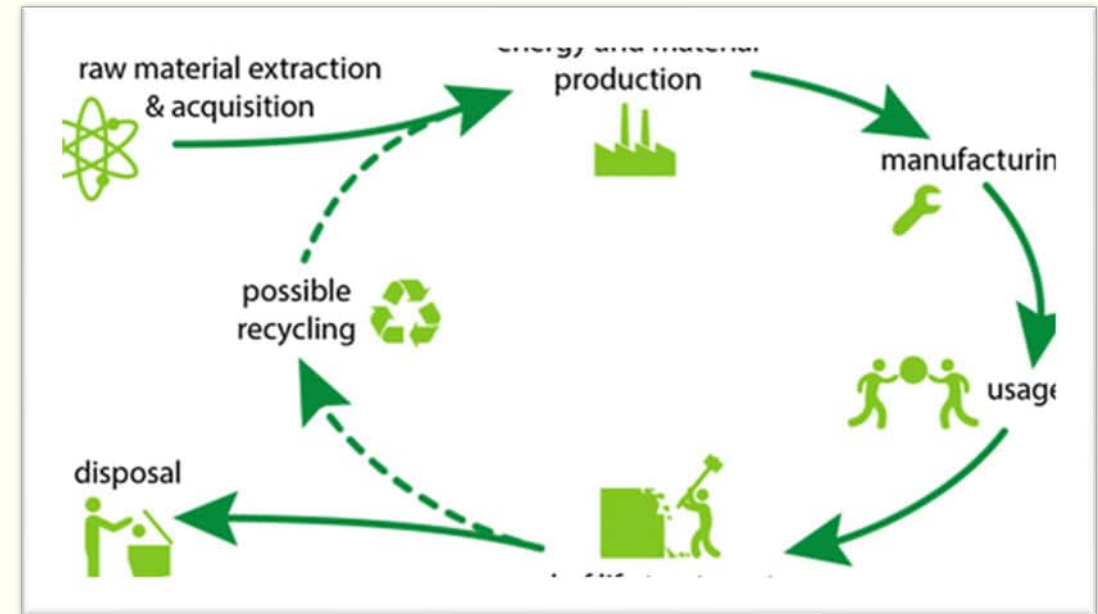
- Material Selection:
 - Environmental Impact
 - Energy Efficiency
 - Durability and End-of-Life Considerations



3. Materials Selection and Lifecycle Analysis

- Lifecycle Analysis(LCA):

Life Cycle Analysis for sustainability in mechatronics involves evaluating the environmental impact of mechatronic products or systems from production to disposal.

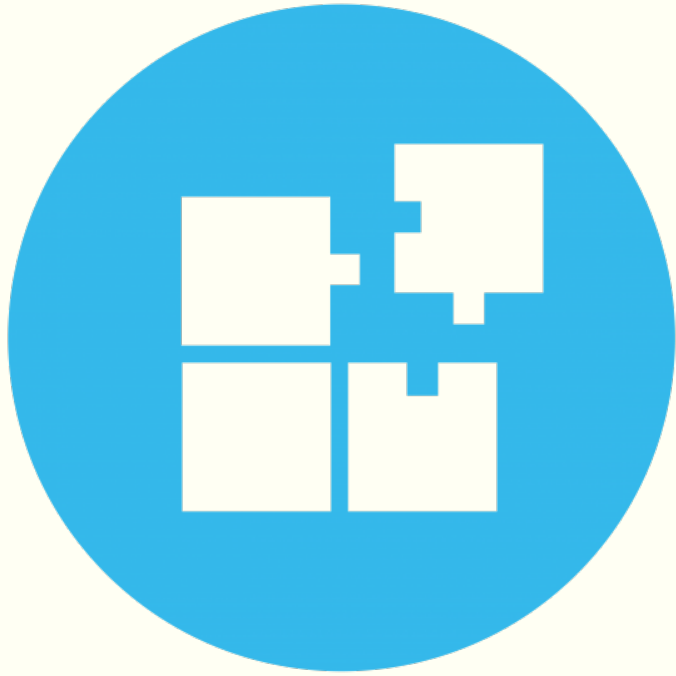


4. Waste Reduction and Recycling:

Minimizing waste generation and implementing recycling programs for components and materials are essential aspects of sustainable mechatronics. This includes designing products for disassembly and recycling at the end of their life.



Waste Reduction Strategies



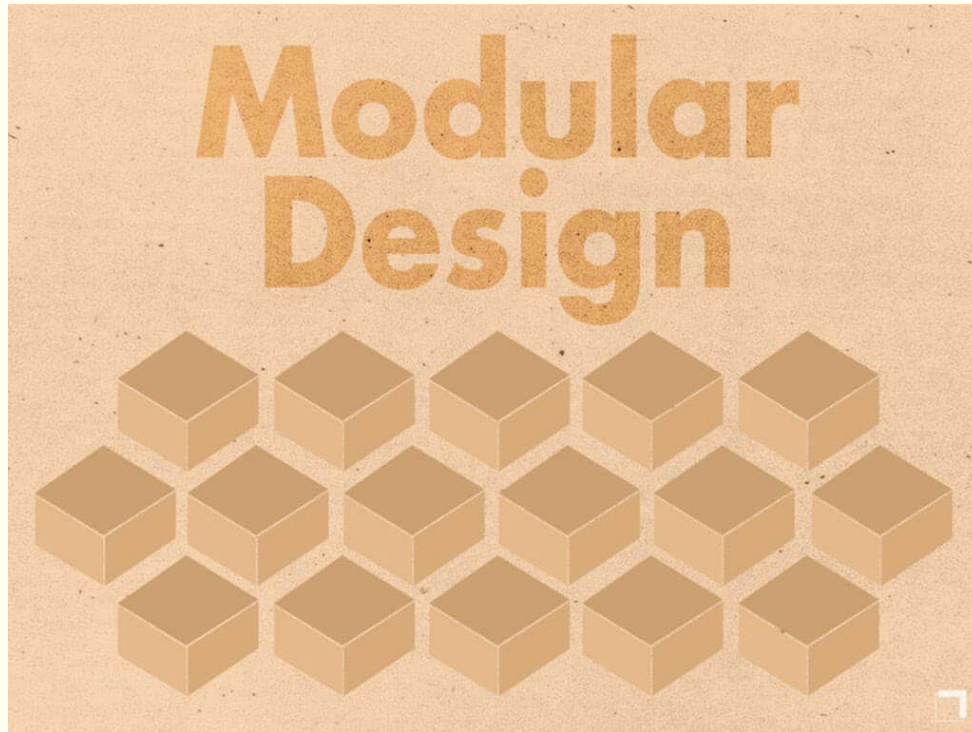
Design for
disassembly

EX. DESIGN FOR DISASSEMBLY

Mirra seat,
Herman Miller



Waste Reduction Strategies



Waste Reduction Strategies

Minimize Packaging

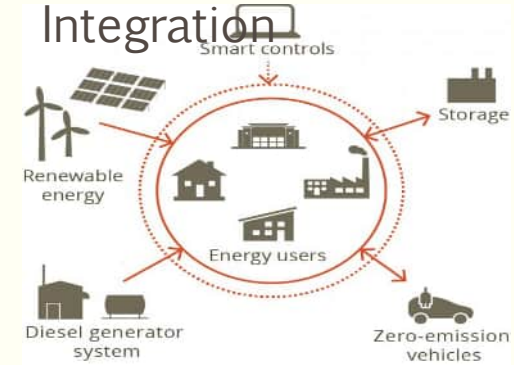


Sustainable Mechatronics Components

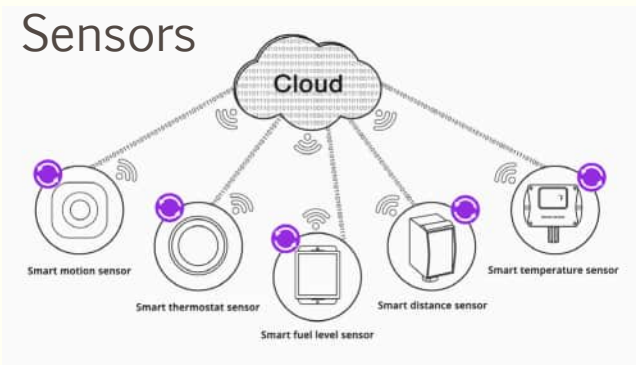
Efficient Motors



Renewable Energy Integration



Smart Sensors



Eco-Friendly Materials



5. Design Elements For Sustainability

Energy Efficiency



Mechatronics engineers play a crucial role in designing energy-efficient systems by optimizing control algorithms, sensors, actuators, and power electronics. They can develop smart energy management systems that dynamically adjust energy consumption based on demand or environmental conditions.

Adaptability and Flexibility



Mechatronics engineers can design modular systems with interchangeable components or software-defined functionality, allowing for easy upgrades, reconfiguration, or repurposing to adapt to changing needs or environments.

Waste Reduction



Mechatronics engineers can design products with built-in sensors for condition monitoring and predictive maintenance, reducing the likelihood of unexpected failures and unnecessary waste generation. They can also develop robotic systems for automated sorting and recycling processes.

Durability and Longevity



Mechatronics engineers can design robust and reliable systems that have extended lifespans through careful selection of components, implementation of predictive maintenance strategies, and incorporation of fail-safe mechanisms to prevent catastrophic failures.

6. Social Considerations:

Sustainable mechatronics also involves considering social impacts, such as ensuring equitable access to technology, promoting job creation in sustainable industries, and addressing potential social inequalities associated with technology deployment.



Conclusion

Overall, sustainability in mechatronics aims to promote the development and deployment of mechatronic systems that are environmentally responsible, socially beneficial, and economically viable over the long term. By integrating sustainability principles into mechatronics engineering practices, it becomes possible to create innovative solutions that meet current needs without compromising the ability of future generations to meet their own needs.

