

Designing & Entrepreneurship:

Neuro Technology & Cognitive Technology;

Conceptualization & Inventing

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SECOND EDITION

BIODESIGN

The Process of Innovating Medical Technologies

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CONCEPT GENERATION

PART-1:

IDEATION

OBJECTIVES:

- Understand the role of ideation in the context of the biodesign innovation process.
- Learn the basic methods of Brain-Storming and how to plan and execute a session.
- Consider other ideation approaches and tips that are specific to biomedical inventing.

“Ideation” is the process of creating new concepts or ideas, and is useful in the biodesign innovation process whenever new solutions are required to address well defined needs.

IDEATION IN NeuroTech - CogniTech

- Invention of these devices can be more involved and complex than invention in many other technology sectors.
- The need for perfection is the enemy of ideation.
- In medtech, abundant opportunities exist to look across specialties to adapt the technologies and approaches from one area to another.
- ideation is particularly useful after the inventor has developed a need specification and is ready to begin thinking about different solution concepts to address the need.
- it is important to realize that ideation is part of an iterative or cyclic approach

SEVEN RULES FOR BRAINSTORMING

Defer judgment

Don't dismiss any
ideas

Encourage wild ideas

Think "outside
the box"

Build on the ideas of others

No "buts," only
"ands."

Go for quantity –

Aim for 100 ideas
in 60 minutes

One conversation at a time

Let people have
their say

Stay focused on the topic

Keep the
discussion on
target

Be visual

Use
objects and toys
to stimulate ideas

CONSIDERATIONS FOR MED-TECH BRAINSTORMING

SELECTING PARTICIPANTS : an inventor or team may want to think carefully whether or not to invite experts in the problem area to participate in the brainstorming session, particularly early in the biodesign innovation process

CHOOSING A FACILITATOR : The facilitator's job is to run the session, enforce the rules of brainstorming, and make sure the process works smoothly

IN ADVANCE OF THE SESSION : group hosting the brainstorming session should think about what background information can be provided before the session to aid the idea generation process

MEDICAL PROPS : it is useful to make props available to participants in a brainstorming session



CONSIDERATIONS FOR MEDTECH BRAIN-STORMING (Contd.)

SUGAR, CAFFEINE, AND BRAINSTORMING ENDORPHINS : It is part of brainstorming ritual to provide participants with candy, cookies, and cola to help ensure a high energy level

MANAGING THE SESSION : It is essential to be clear with participants that the brainstorming session will require 60 to 90 minutes of uninterrupted attention

CAPTURING THE RESULTS : In capturing the results of a brainstorm it is important to assess whether all of the solutions are sufficiently well thought out to potentially take forward into concept screening and prototype development, or whether one or more ideas may still be too general and in need of further brainstorming

INTELLECTUAL PROPERTY OWNERSHIP : The inventor or team needs to be clear with the members of a brainstorming group regarding the implications of their participation in the session with respect to IP

CONCEPT GENERATION

PART-2:

INITIAL CONCEPT SELECTION

OBJECTIVES:

- Understand how to cluster and organize the output of ideation so it can be analyzed in order to determine whether additional ideation is needed.
- Learn to objectively compare solution concepts against the criteria in the need specification to determine which concepts to pursue.

Initial Concept Selection: This involves comparing all of the ideas generated against the need statement and need criteria defined in the need specification to evaluate how well each solution may (or may not) solve the need.

Grouping and organizing ideas:

Once the raw data from ideation have been reviewed, “cleaned up,” and labeled, innovators can group and organize the concepts.

- ✓ Organizing concepts is important because it allows innovators to identify gaps, biases, and synergies among the ideas.
- ✓ The first step in the grouping process is to identify the “Primary Organizing Principle” for creating the clusters.

Organizing principles to cluster ideas into initial concept selection

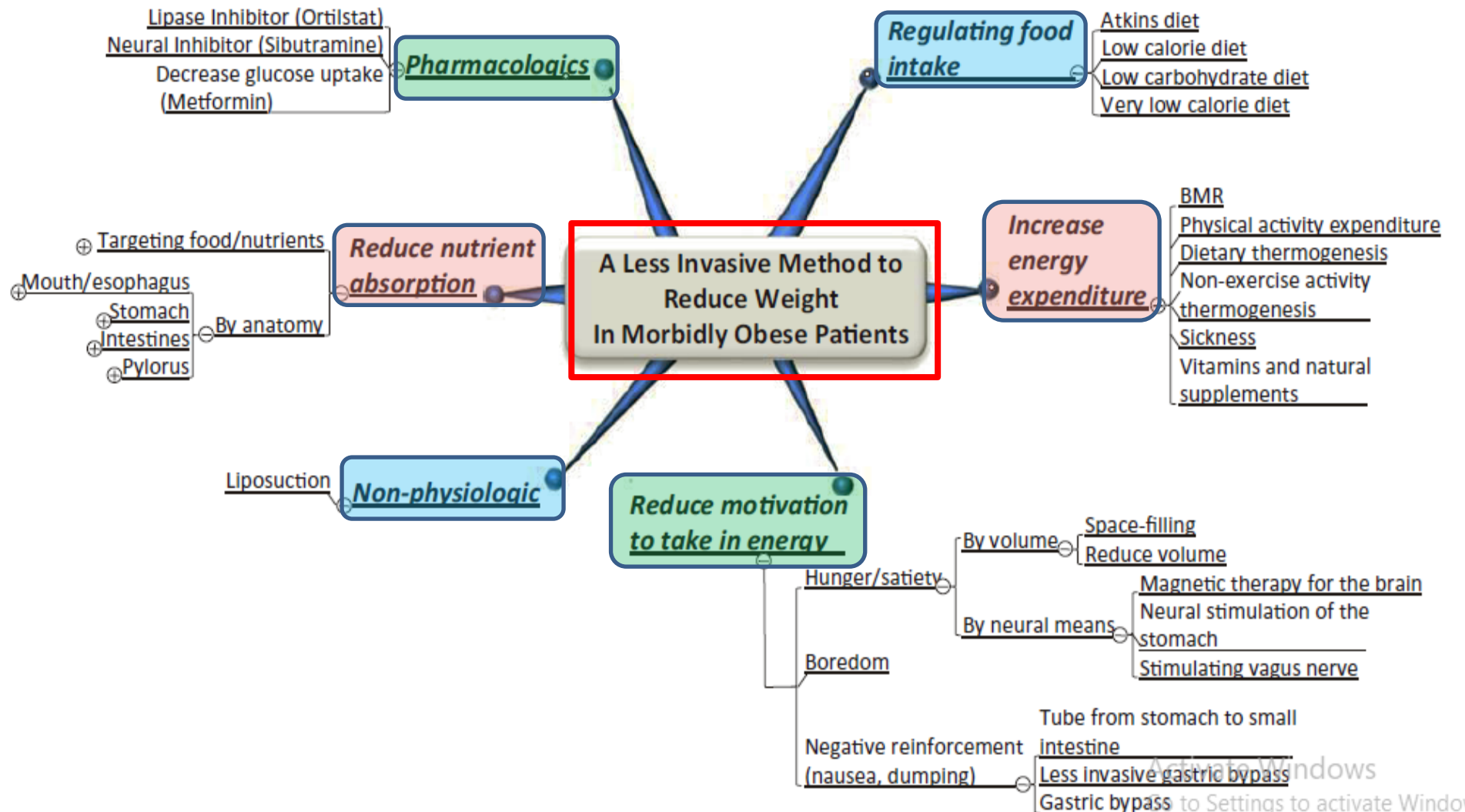
Organizing principle	Description
Anatomic location	<p>Group ideas according to the part of the anatomy they pertain to and/or target. Differences between groupings might be small if all solutions are in a highly focused area (e.g., the vertebral discs). Alternatively, groupings might span entire regions/organ systems if the solutions focus on a need pertinent to a significant portion of the body (such as the various places to which emboli dislodged from the heart can travel).</p>
Mechanism of action	<p>Group ideas according to how the solutions are intended to work.</p>

Contd....

Organizing principle	Description
Appeal to decision makers	<p>Group ideas around the interests of decision makers who will potentially pay for a solution to the need, which is often a facility or payer. These stakeholders are usually interested in the cost-effectiveness of new solutions relative to available treatments. Remember that in some cases, patients may be the ultimate decision makers if a solution must be paid for out-of-pocket, which can have slightly different implications.</p>

CASE STUDY: “CONCEPT MAP” FOR ANY INVENTION:

LESS INVASIVE METHOD TO REDUCE WEIGHT IN OBESITY



COMPARING IDEAS USING THE NEED SPECIFICATION

- ✓ The goal of this process is to narrow the universe of ideas to a few concepts that seem to best address the need.
- ✓ It is advisable to start by assessing the extent to which proposed solutions satisfy the need statement itself and then the must-have need criteria.
- ✓ Involving more individuals in the selection process is another specific tactic that can be used to help minimize personal bias.
- ✓ Participants with business backgrounds might also be able to help evaluate how needs might meet certain cost, marketing, or value criteria.
- ✓ Innovators may also eliminate promising solution concepts based on their personal project acceptance criteria.