

**What is the 'organ of interest'
for the medical specialty of psychiatry**

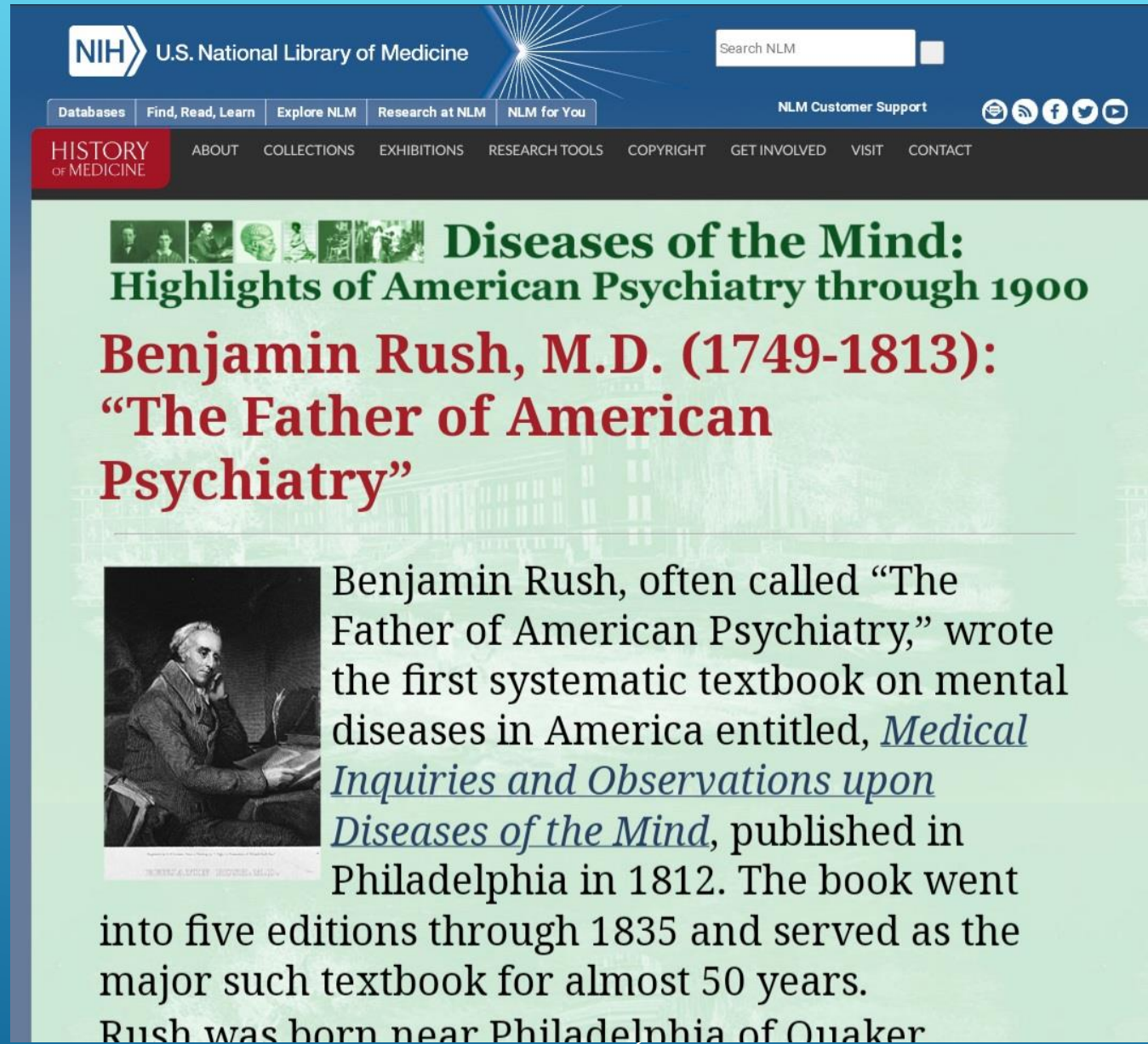
- brain or mind?

Shrirang Bakhle

Psychiatry Journal Club 16 Oct 22



Psych-iatry
began as the
'study of disorders of the
mind'



The screenshot shows the NIH U.S. National Library of Medicine website. At the top, there is a search bar labeled "Search NLM" and a navigation menu with links: "Databases", "Find, Read, Learn", "Explore NLM", "Research at NLM", and "NLM for You". Below this is a "HISTORY of MEDICINE" banner with a red background. The main content area features a green background with the title "Diseases of the Mind: Highlights of American Psychiatry through 1900" in green text. Below the title, the name "Benjamin Rush, M.D. (1749-1813): 'The Father of American Psychiatry'" is written in large red text. To the left of the text is a small portrait of Benjamin Rush. To the right, a paragraph describes his work: "Benjamin Rush, often called 'The Father of American Psychiatry,' wrote the first systematic textbook on mental diseases in America entitled, *Medical Inquiries and Observations upon Diseases of the Mind*, published in Philadelphia in 1812. The book went into five editions through 1835 and served as the major such textbook for almost 50 years. Rush was born near Philadelphia of Quaker

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The screenshot shows the NIH U.S. National Library of Medicine website. The header includes the NIH logo, a search bar, and navigation links. The main content area is titled "Diseases of the Mind: Highlights of American Psychiatry through 1900". Below this, it features a section on Benjamin Rush, M.D. (1749-1813), referred to as "The Father of American Psychiatry". A portrait of Rush is shown next to text describing his work, "Medical Inquiries and Observations upon Diseases of the Mind", published in 1812. Red circles highlight the title "Diseases of the Mind", the phrase "The Father of American Psychiatry", and the title of Rush's book.

NIH U.S. National Library of Medicine

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Diseases of the Mind:
Highlights of American Psychiatry through 1900

Benjamin Rush, M.D. (1749-1813):
"The Father of American Psychiatry"

 Benjamin Rush, often called "The Father of American Psychiatry," wrote the first systematic textbook on mental diseases in America entitled, *Medical Inquiries and Observations upon Diseases of the Mind*, published in Philadelphia in 1812. The book went into five editions through 1835 and served as the major such textbook for almost 50 years. Rush was born near Philadelphia of Quaker

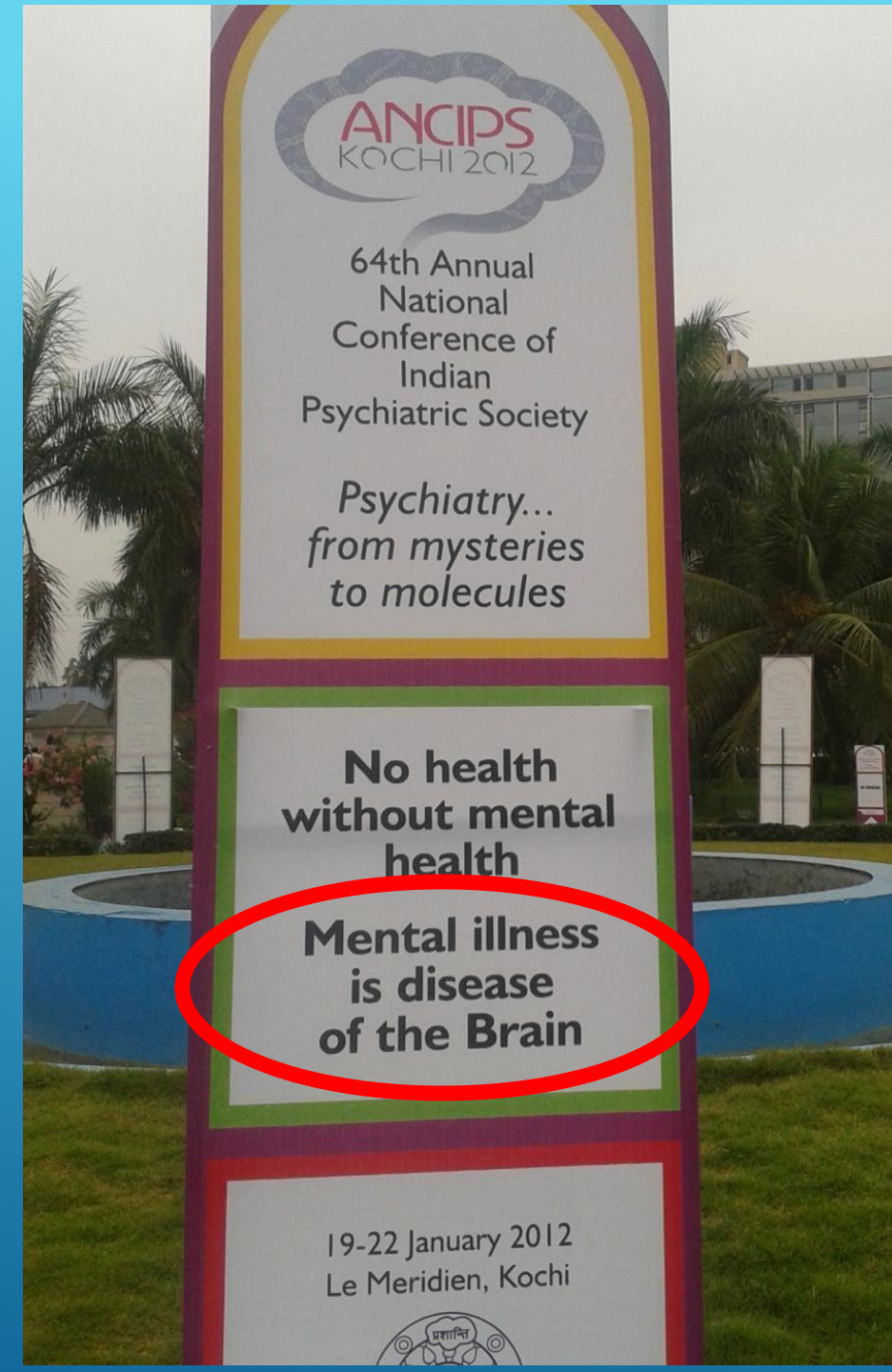
But the current paradigm says,

‘Mental disorders are disorders of the brain’

Thomas Insel, as Director of NIMH:

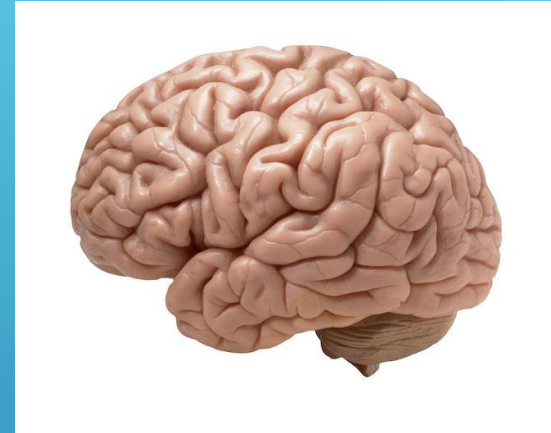
‘It has become an NIMH mantra to describe mental disorders as brain disorders.’

(Director’s Blog on Aug 12, 2011)

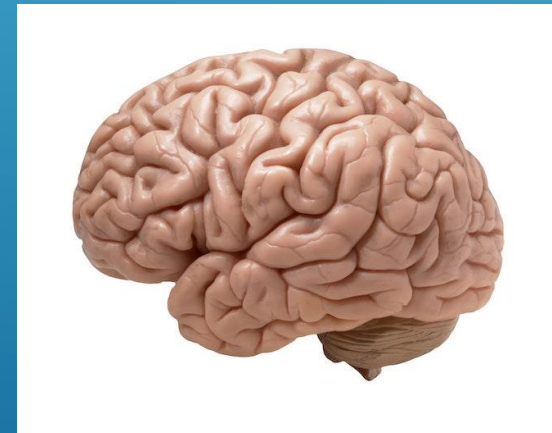


But this stance leads to many uncomfortable and unanswerable questions such as:

If the 'organ of interest' for psychiatry is brain



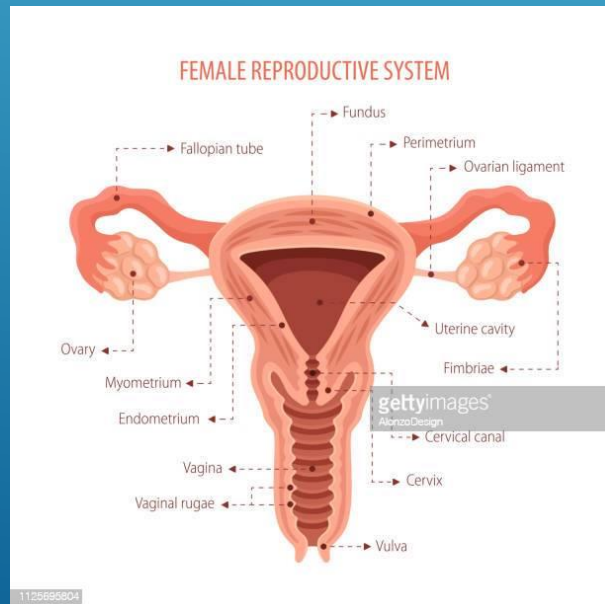
Then the 'organ of interest' for neurology?



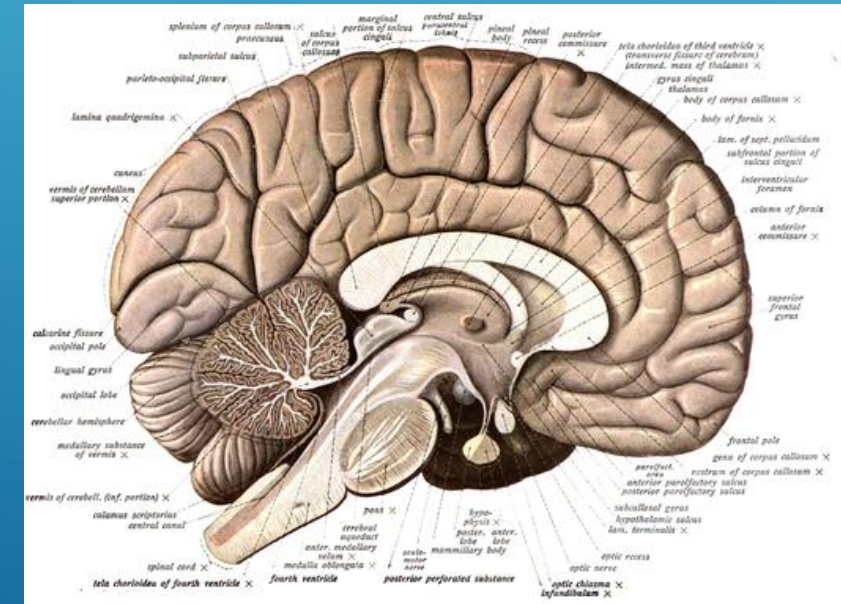
While examining patients
every clinician has the framework of the organ of interest in mind

The clinician endeavours to know where the dysfunctions are.

e.g. gynaecologist



Psychiatrist ??



**At the end of clinical examination,
do psychiatrists diagnose -**

Brain dysfunctions?

**“This patient has dysfunction
in caudate nucleus,
increased levels of glutamate
in hippocampus, mPFC and
LTP of Mesolimbic pathway”**

Mind dysfunctions?

**“This patient is suffering from
intense sadness and moderate
anger related to the topic of
divorce”**

If both psychiatry and neurology treat disorders of the same organ
brain

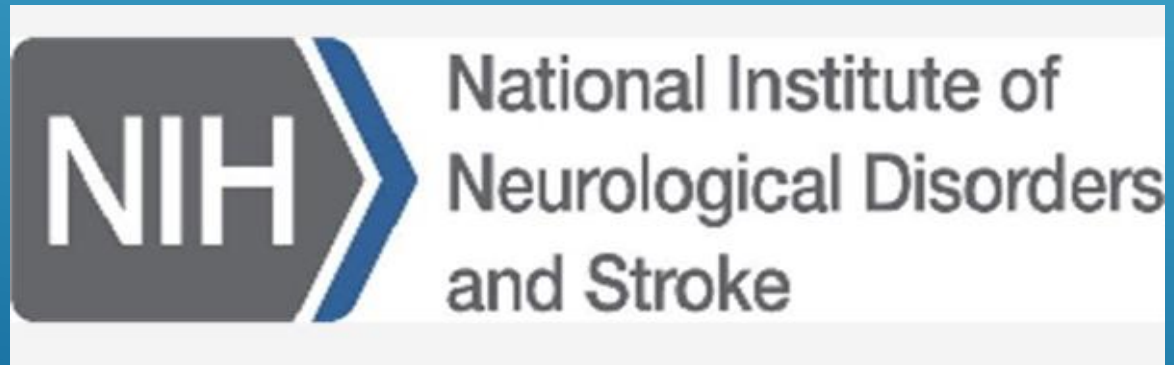
then, should we merge

wards and departments of psychiatry and neurology?

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Mental disorders and Neurological disorders
– both happen in the brain.

**But the difference is so significant that
NIH has 2 separate institutes for them:**



Every chapter of ICD-11 is for a separate organ or system.

▼ ICD-11 for Mortality and Morbidity Statistics



- ▶ 01 Certain infectious or parasitic diseases
- ▶ 02 Neoplasms
- ▶ 03 Diseases of the blood or blood-forming organs
- ▶ 04 Diseases of the immune system
- ▶ 05 Endocrine, nutritional or metabolic diseases
- ▶ 06 Mental, behavioural or neurodevelopmental disorders
- ▶ 07 Sleep-wake disorders
- ▶ 08 Diseases of the nervous system
- ▶ 09 Diseases of the visual system
- ▶ 10 Diseases of the ear or mastoid process
- ▶ 11 Diseases of the circulatory system
- ▶ 12 Diseases of the respiratory system
- ▶ 13 Diseases of the digestive system
- ▶ 14 Diseases of the skin
- ▶ 15 Diseases of the musculoskeletal system or connective tissue

Every chapter of ICD-11 is for a separate organ or system.

Even though both are disorders of the brain,

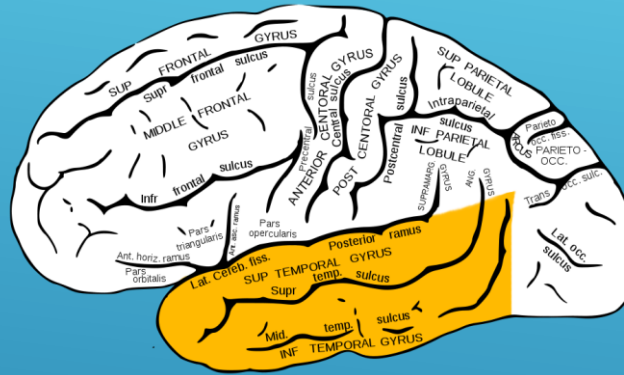
ICD-11 has assigned them to different chapters

▼ ICD-11 for Mortality and Morbidity Statistics



- ▶ 01 Certain infectious or parasitic diseases
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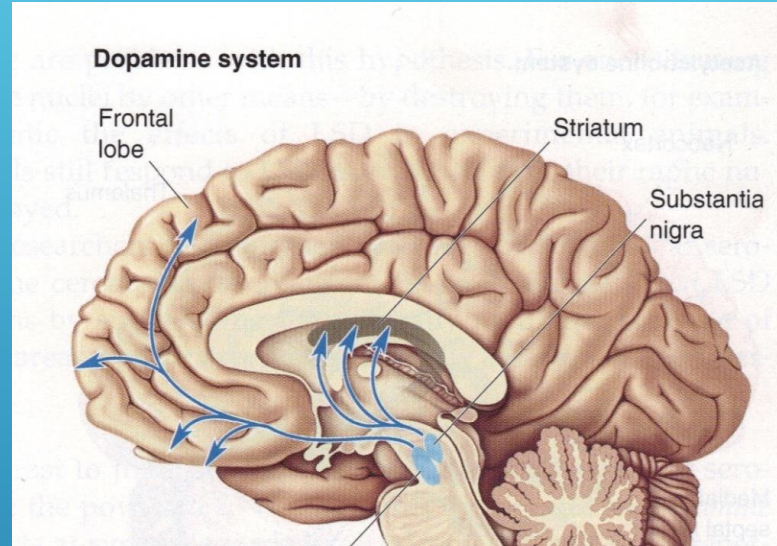
Can we differentiate between these 2 groups
on the basis of neuroanatomy?



e.g., can we say -

- disorders of some parts of brain (say, Temporal lobe) are Mental Disorders
- and disorders of other parts are Neurological Disorders?

Can we differentiate on the basis of Neurophysiology?



e.g., can we say

- disorders of Dopaminergic system are Mental disorders
- and disorders of other systems are Neurological Disorders?

Can we say that
Mental disorders are 'functional' &
Neurological disorders are 'structural'?

There are hundreds of studies that demonstrate the 'structural'
lesions in Mental disorders

– including hypertrophy & atrophy of brain parts
such as hippocampus and amygdala

So, this is not a point of differentiation.



Understanding the differences between Mental disorders and Neurological disorders is important:

Practical day-to-day needs:

What criteria guide the decision to admit a patient in Psychiatry Ward or Neurology Ward?

This is also important from legal and stigma point of view.


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The Mental Healthcare Act, 2017 is applicable to people with 'mental illness'

If 'mental illness is disease of the brain', then is it applicable to all disorders of the brain
- including Neurological disorders?

Need to differentiate between Mental disorders and Neurological disorders.

रजिस्ट्री सं० डी० एल०—(एन)04/0007/2003—17 REGISTERED NO. DL—(N)04/0007/2003—17


सत्यमेव जयते

भारत का राजपत्र
The Gazette of India

असाधारण
EXTRAORDINARY
भाग II — खण्ड 1
PART II — Section 1
प्राधिकार से प्रकाशित
PUBLISHED BY AUTHORITY

सं० 10] नई दिल्ली, शुक्रवार, अप्रैल 7, 2017/चैत्र 17, 1939 (शक)
No. 10] NEW DELHI, FRIDAY, APRIL, 7, 2017/CHAITRA 17, 1939 (SAKA)

इस भाग में भिन्न पृष्ठ संख्या दी जाती है जिससे कि यह अलग संकलन के रूप में रखा जा सके।
Separate paging is given to this Part in order that it may be filed as a separate compilation.

MINISTRY OF LAW AND JUSTICE
(Legislative Department)
New Delhi, the 7th April, 2017/Chaitra 17, 1939 (Saka)

The following Act of Parliament received the assent of the President on the 7th April, 2017, and is hereby published for general information:—

THE MENTAL HEALTHCARE ACT, 2017
No. 10 OF 2017 [7th April, 2017.]

An Act to provide for mental healthcare and services for persons with mental illness and to protect, promote and fulfil the rights of such persons during delivery of mental healthcare and services and for matters connected therewith or incidental thereto.

WHEREAS the Convention on Rights of Persons with Disabilities and its Optional Protocol was adopted on the 13th December, 2006 at United Nations Headquarters in

(s) “**mental illness**” means a substantial disorder of thinking, mood, **perception**, orientation or memory that grossly impairs judgment, behaviour, capacity to recognise reality or ability to meet the ordinary demands of life, mental conditions associated with the abuse of alcohol and drugs, but does not include mental retardation which is a condition of arrested or incomplete development of mind of a person, specially characterised by subnormality of intelligence;

Cortical blindness

Psychogenic blindness

| | | |
|--------------------------------------|-----------------|-----|
| - Dysfunction of perception? | Yes | yes |
| - Brain dysfunction? | Yes | yes |
| - Mind dysfunction? | No | yes |
| - MHA applicable? | No | Yes |
| | | |
| - MHA applicable? | MHA applicable? | |
| - Neurological Disorder? | No | |
| - Functional Neurological Disorders? | Yes | |

(s) **“mental illness”** means a substantial disorder of thinking, mood, perception, orientation or memory that grossly impairs judgment, behaviour, capacity to recognise reality or ability to meet the ordinary demands of life, mental conditions associated with the abuse of alcohol and drugs, but does not include mental retardation which is a condition of arrested or incomplete development of mind of a person, specially characterised by subnormality of intelligence;

Cortical blindness

Psychogenic blindness

- **Dysfunction of perception?**
- **Brain dysfunction?**
- **Mind dysfunction?**
- **MHA applicable?**

Yes

yes

Yes

yes

No

yes

No

Yes

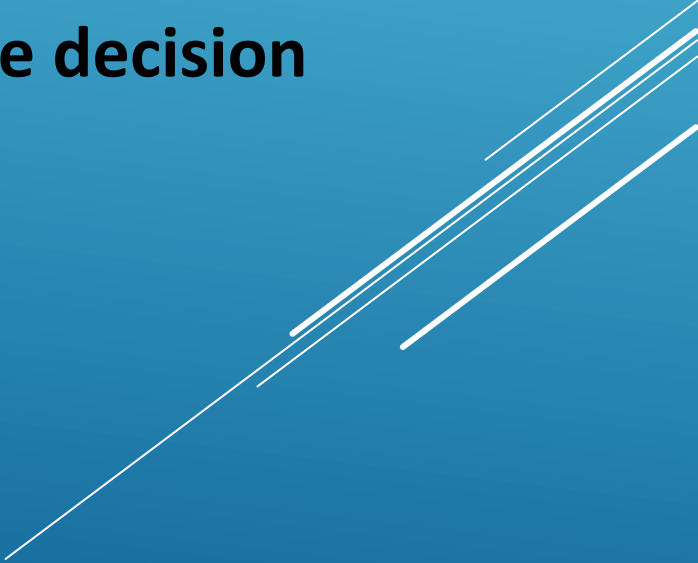
MHA applicable?

- **Neurological Disorder?**
- **Functional Neurological Disorders?**

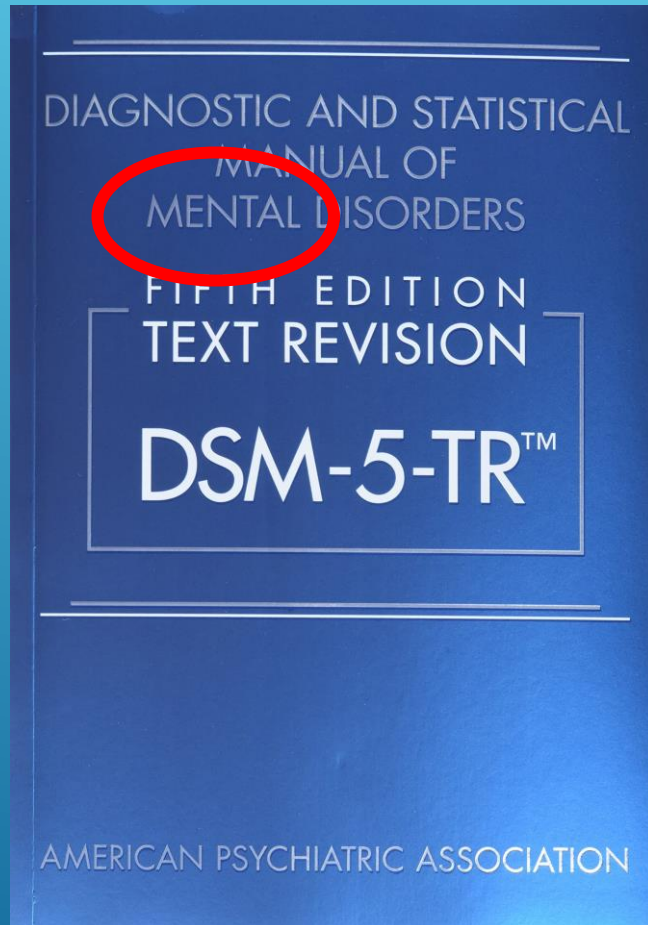
No

Yes

Nosological considerations:

- **What criteria guide the decision to include a disorder in Chapter 6 or 8 of ICD-11?**
 - **What inclusion and exclusion criteria guide the decision to exclude or include a disorder in DSM?**
- 
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The DSM-5-TR is a comprehensive compendium of Mental Disorders




Every Mental Disorder is included in DSM-5.

No non-mental disorder is included in it.

Unfortunately, DSM-5 does not describe any inclusion or exclusion criteria


But we can attempt to understand why a disorder is included and why another is excluded:

- 1. Conversion Disorder with paralysis**
 - 2. Hemiplegia due to vascular event (e.g. cerebral infarct)**
 - 3. Vascular Neurocognitive Disorder**
- 
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| | Conversion Disorder with paralysis | Hemiplegia due to vascular event | Vascular Neurocognitive Disorder |
|---------------------------|------------------------------------|----------------------------------|----------------------------------|
| Included in DSM-5 | Yes | No | Yes |
| Presenting feature | Paralysis | Paralysis | |
| Vascular aetiology | | Yes | Yes |
| Mental dysfunction | Yes | No | Yes |

| | Conversion Disorder with paralysis | Hemiplegia due to vascular event | Vascular Neurocognitive Disorder |
|--------------------|------------------------------------|----------------------------------|----------------------------------|
| Included in DSM-5 | <u>Yes</u> | No | <u>Yes</u> |
| Presenting feature | Paralysis | Paralysis | |
| Vascular aetiology | | Yes | Yes |
| Mental dysfunction | <u>Yes</u> | No | <u>Yes</u> |

The term 'Mental' is vital in Psychiatry:

- Mental Status Examination
 - Diagnostic and Statistical Manual of Mental Disorders
 - National Institute of Mental Health
- 
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If Mental Disorders are disorders of the brain

can we replace

Brain

* ~~Mental~~ Status Examination

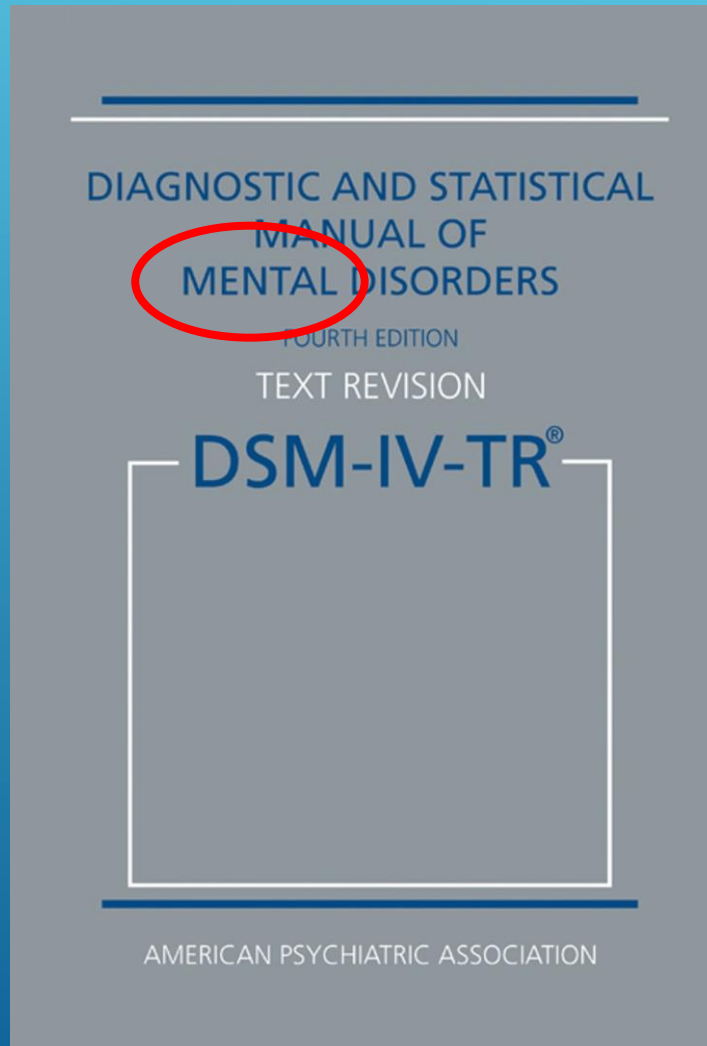
Neurological

* National Institute of ~~Mental~~ Health ??

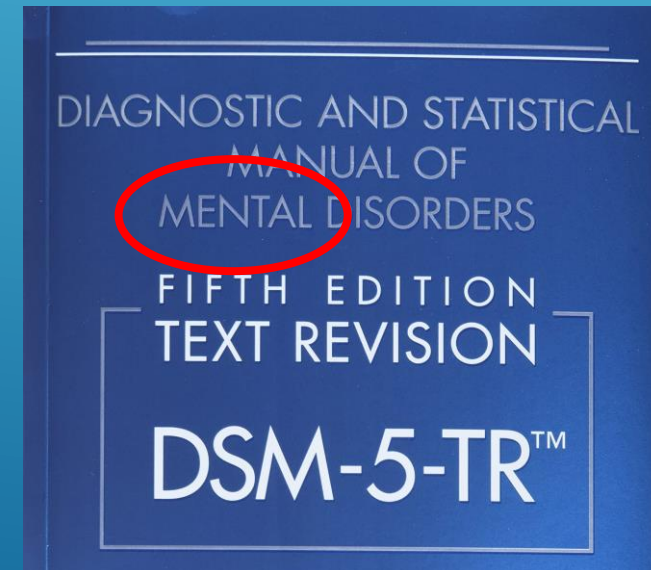
Brain

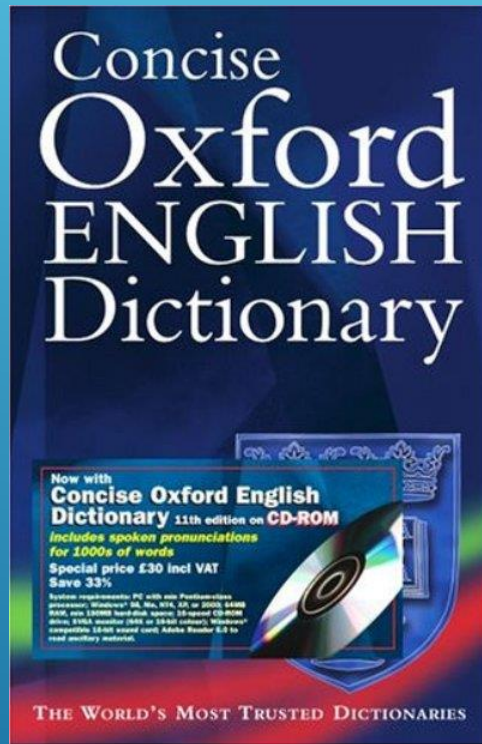
* DSM of ~~Mental~~ Disorders

In fact, DSM- IV-TR said the following about this issue:



“...unfortunately the term (mental) persists in the title of DSM-IV-TR because we have not found an appropriate substitute.” (p.xxx)





‘mental’:

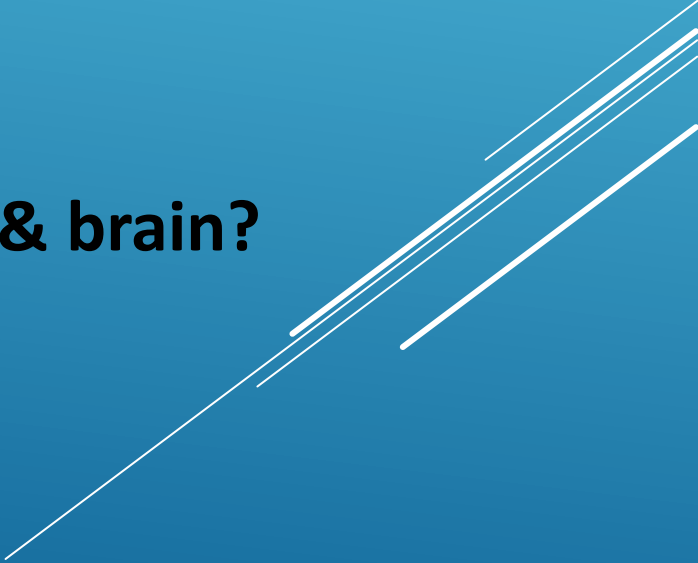
1. Relating to the mind.
2. Relating to disorders or illnesses of the mind.

Can we say that

Mental disorders = disorders of mind

Neurological disorders = disorders of brain

The moment we say 'mind', 4 question arise:

- What is 'mind'?
 - What are the parts of the mind?
 - How does it work?
 - What is the exact relationship between mind & brain?
- 
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Survey of Psychiatrists' perceptions about 'mind' and its position in Psychiatry.


- Bakhle, Shrirang, Indian Journal of Mental Health, 2015; 2(1): 70-73

Conclusions:


- 88.8 % believed in an entity called 'mind'**
- 66.6 % opined that there is no universally accepted theory or model of mind**
- To the question, 'What is mind?', 33 out of 36 gave different answers (3 did not answer) indicating lack of consensus**

Presenting a very brief introduction:

The 4-Levels, 5-Parts Framework of the mind – brain (4L5PF)

- **An umbrella framework that incorporates all aspects normal mind and all aspects of mental disorders**
 - **Describes the nature of mind and how it arises in the brain**
 - **Equally compatible with current understanding of neuroscience & psychotherapies**
 - **Can be used clinically while evaluating patients**
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What is mind?

- **Mind is a specific subset of the functions of the brain**
 - **Mind is an active Functional Organization – capable of processing inputs to produce outputs**
 - **Mind is the aggregate of everything that we are aware of**
 - **Mind is the topmost User Interface level of the 4 levels of software of the mind-brain**
- 
- A series of white diagonal lines of varying lengths and thicknesses, located in the bottom right corner of the slide, creating a sense of motion or a stylized graphic element.

Mind is a specific subset of the functions of the brain

Brain performs many functions. Producing mind is one of them.

Mind is produced in the brain – but mind is not the same as brain.

E.g., Department of Psychiatry (DoP) is nested in the Medical College.
but its not the same as Medical College.

If we point to DoP, we can say: “This is DoP” or “This is Med College”
Both are right.

But saying “This is DoP” is precise.

We can say:

- **“Mental disorders are disorders of the human body”
(since brain is a part of body)**
- **“Mental disorders are disorders of the brain”**
- **“Mental disorders are disorders of the mind”**

Which statement is most precise?



Mind is an active Functional Organization
– capable of processing inputs to produce outputs

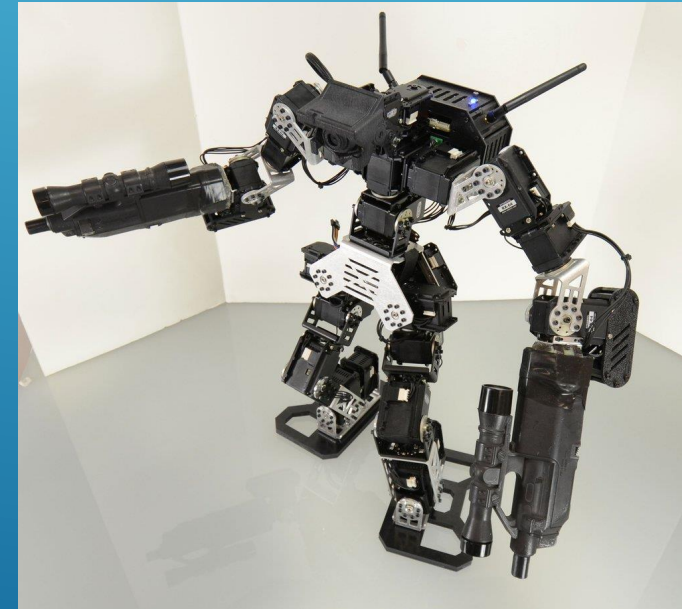
Mind is not just a list of functions.
(such as in MHA – thinking, mood, perception, orientation, memory)

list of functions



**E.g., cognition, Higher
Functions, Executive Functions**

active Functional Organization



Mind

Brain

Mind =
Central
processor

Inputs

Outputs



Brain

**Mind =
Central
processor**

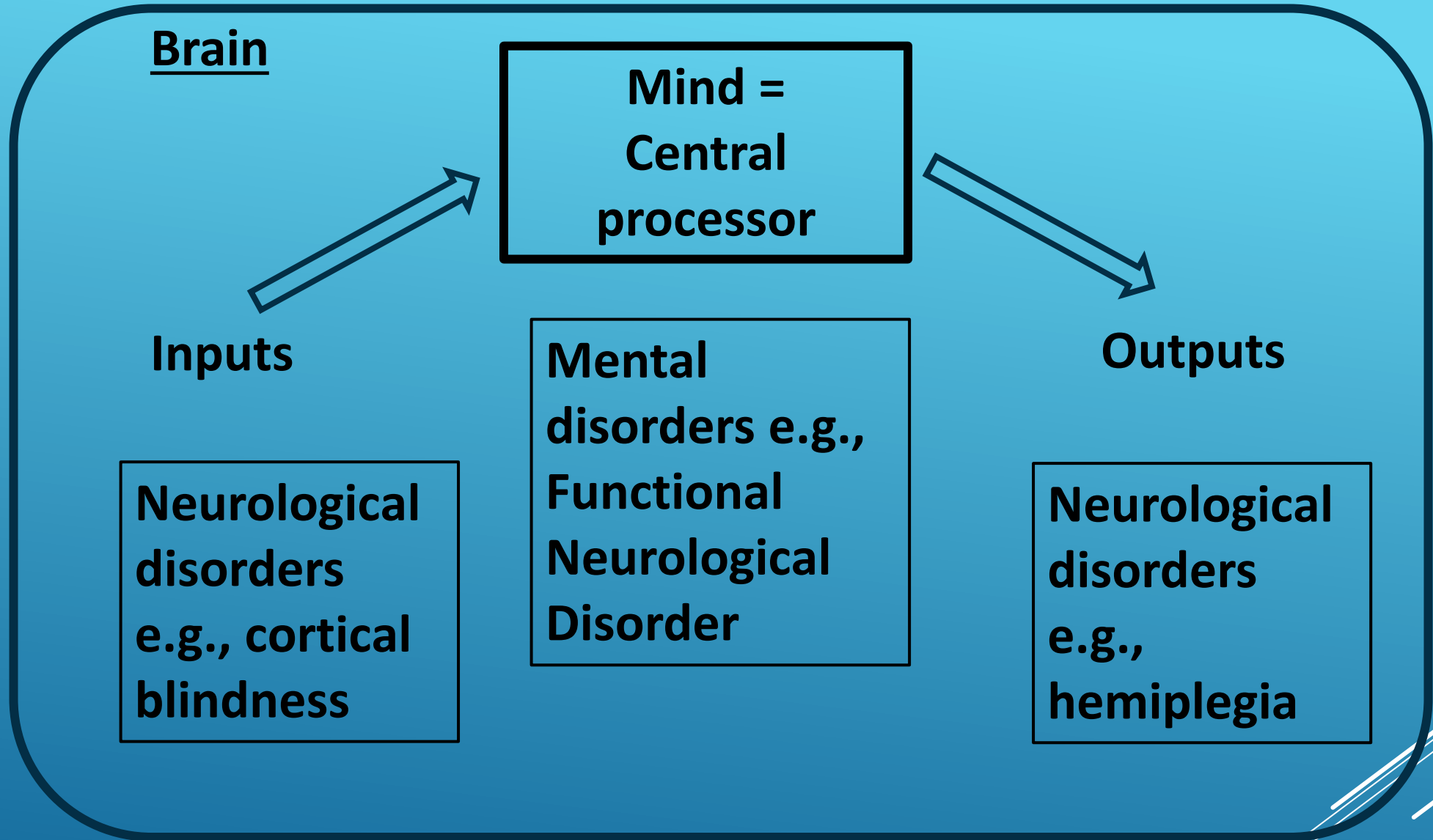
Inputs

**Neurological
disorders
e.g., cortical
blindness**


**Mental
disorders e.g.,
Functional
Neurological
Disorder**

Outputs

**Neurological
disorders
e.g.,
hemiplegia**



Mind is the aggregate of everything that we are aware of

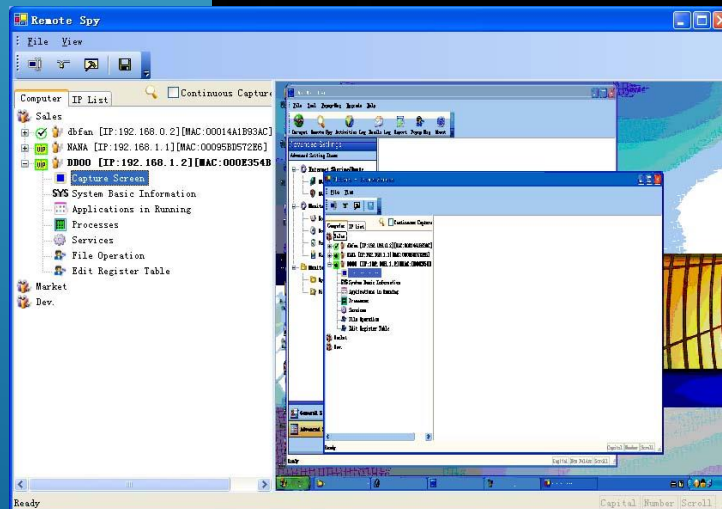
- 1. Beliefs**
 - 2. Wishes**
 - 3. Emotions**
 - 4. Attention of the mind**
 - 5. Mental Abilities**
- 
- Several white diagonal lines of varying lengths and thicknesses are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.

Mind is the topmost User Interface level of 4 levels of software of mind – brain

4 levels of software of computer

High level language

Binary code



Windows Advanced Options Menu
Please select an option:

recent settings that worked
domain controllers only)

highlight to your choice.

A problem has been detected and windows has been shut down to prevent damage
to your computer.

DRIVER_IRQL_NOT_LESS_OR_EQUAL

At the time you've seen this Stop error screen,
Windows has attempted to stop your computer from doing more damage.

To help you diagnose the problem and prevent it from happening again, Windows has
shut down your computer.

Before you try any new hardware or software is properly installed,
ask your hardware or software manufacturer for help.
Safe Mode to remove or disable components, restart
your computer, and then

on:
0x0000000C, 0x00000002, 0x00000000, 0xF86B5A89)

Address F86B5A89 base at F86B5000, DateStamp 3dd991eb

physical memory
up complete.
administrator or technical support group for further

Assembly language



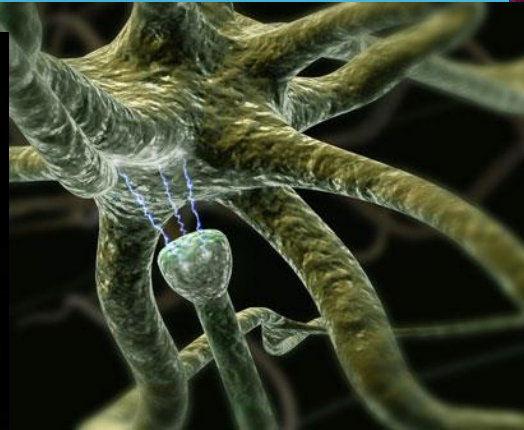
User interface – we are aware of

4 levels of the software of the mind - brain

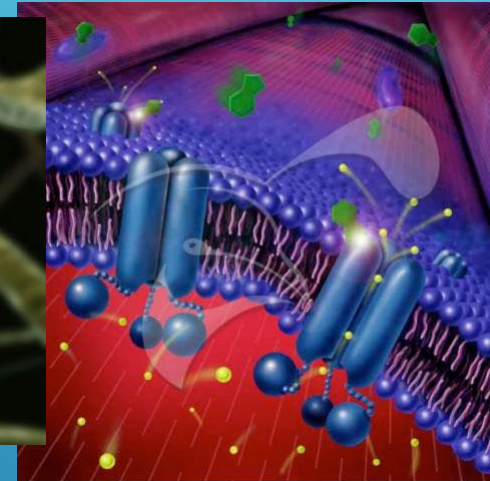
User Interface:
What we are
aware of



Temporospatial
firing of groups of
neurons

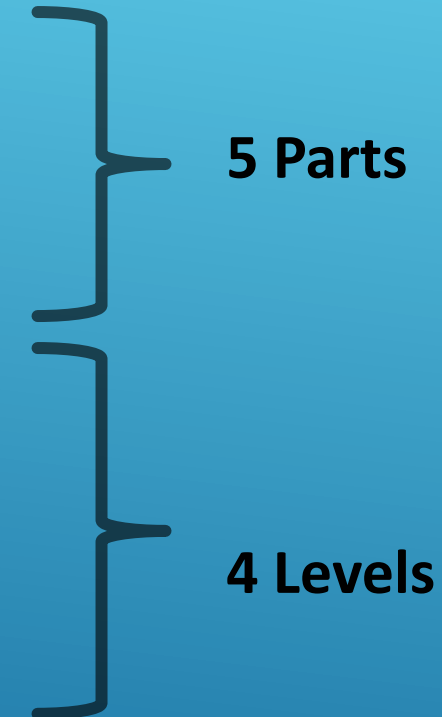


Impulses across
neurons & synapses



Influx &
efflux of ions
in channels


The 4-Levels, 5-Parts Framework of the mind-brain



Each of the 5 parts has
4-Levels

Using the 4-Levels, 5-Parts Framework, mind can be described like other organs of the body:

The Human Mind

- Anatomy**
 - Physiology**
 - Pathology**
 - Clinical Examination**
 - Investigations**
 - Diagnosis**
 - Therapies**
- 
- Several white lines of varying lengths and slopes are positioned in the bottom right corner of the slide, creating a modern, abstract graphic element.

Mind: Anatomy = parts of the mind (functional)

- 1. Beliefs
- 2. Wishes
- 3. Emotions
- 4. Attention of the mind
- 5. Mental Abilities

Mind: Physiology

= how mind performs its functions of processing inputs

Processing of a single input in 8 steps

1. Receiving the input into the mind
2. Identification (or interpretation of the meaning) of the input,
3. Importance recognition (and selection of the 'important' input)
4. Detailed Event Analysis
5. Wish Fulfilment Analysis and production of emotions,
6. Decision about action (or inaction)
7. Planning and execution of action.
8. Gratification or disappointment.

Processing of multiple inputs that the mind receives



Mind: Pathology

All dysfunctions found in all mental disorders can be described using 4L5P Framework

- systematically categorized in terms of mind parts & Input Processing Function

| Functional parts and Physiology | Specific dysfunctions |
|---------------------------------|-----------------------|
| 1. Beliefs | e.g. Delusions |
| 2. Wishes | e.g. Addictions |
| 3. Emotions | e.g. Hypersadness |
| 4. Attention | e.g. Distractibility |
| 5. Mind Operating System | e.g. Thought Replay |
| Input Processing function | e.g. Thought Block |

Mind: Clinical Examination

4L5P Framework adds clarity to MSE:

Mental Status Examination

= examination done to know status of mind

E.g.,


MSE: Thought Process (non-specific term)

4L5PF: 'Processing of each input (in 8 steps)' &
'processing of multiple inputs'

Mind: Investigations

4L5P Frameworks brings clarity to understanding investigations:

E.g., 3 categories of investigations:

- 1. Investigations to know neural correlates of mind dysfunctions**
 - 2. Investigations attempting to do 'mind-reading'**
 - 3. Investigations as bio-markers**
- 
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Mind: Diagnosis

Unique perspectives on psychiatric diagnosis:

2 categories of diagnosis:

- Pattern Title Diagnoses such as DSM, ICD
- Whole Mind Diagnosis – a novel concept

Mind: Therapies

4L5P Framework explains how different therapies act on 4 different levels of the software of the mind.

Psychotherapies:

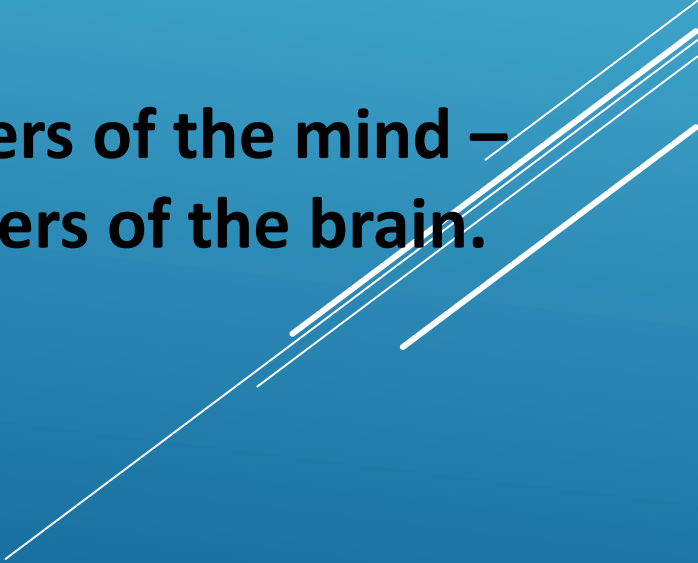
4L5PF helps to explain the actions of all types of psychotherapies on mind.

It also helps in formulation of better focussed psychotherapeutic techniques.

Pharmacotherapies:

4L5PF provides unique insights such as differences between indications, therapeutic effects & mechanism of action.

Summary:

- The 'organ of interest' for psychiatry is mind – not brain.
 - Mind is a specific subset of the functions of the brain – but it is not same as brain.
 - Mind is the aggregate of all that we are aware of.
 - Mind is an active Functional Organization.
 - The 4-Levels, 5-Parts Framework explains how mind is created in the brain.
 - It is precise to say that Mental disorders are disorders of the mind – rather than saying that Mental disorders are disorders of the brain.
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My sincere thanks to

Prof. Dr. Bharat Shah

**For invaluable help
in my research journey!**



Thank you!!

