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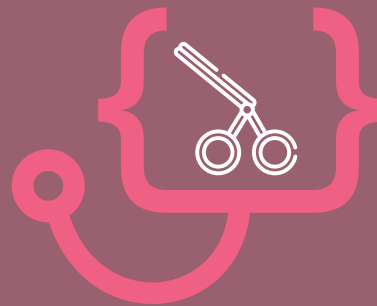
Department of Health Research

Ministry of Health and Family Welfare, Government of India



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2019 Edition, Vol. I

STANDARD TREATMENT WORKFLOWS *of India*

PARTNERS

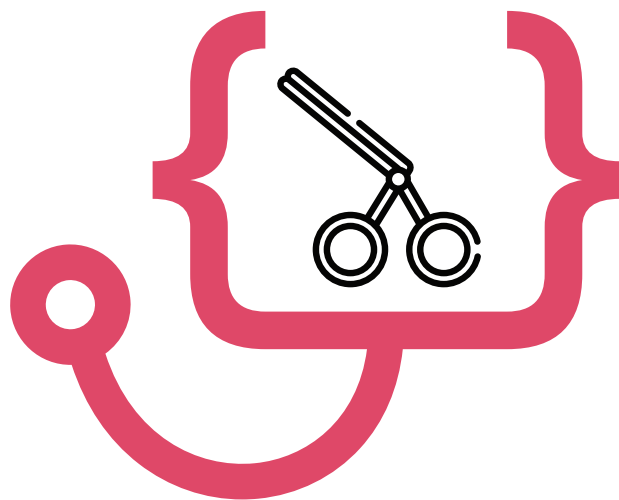


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STANDARD
TREATMENT
WORKFLOWS
of India



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Department of Health Research
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These STWs have been prepared by national experts of India with feasibility considerations for various levels of healthcare system in the country. These broad guidelines are advisory, and are based on expert opinions and available scientific evidence. There may be variations in the management of an individual patient based on his/her specific condition, as decided by the treating physician. There will be no indemnity for direct or indirect consequences. Kindly visit our web portal (stw.icmr.org.in) for more information. © Indian Council of Medical Research and Department of Health Research, Ministry of Health & Family Welfare, Government of India.

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- NEUROINFECTIONS
- STROKE



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INTRODUCTION

GOAL

To empower the primary, secondary and tertiary care physicians/surgeons towards achieving the overall goal of Universal Health Coverage with disease management protocols and pre-defined referral mechanisms by decoding complex guidelines

OBJECTIVES

Primary Objective:

To formulate clinical decision making protocols for common and serious medical/surgical conditions for both OPD and IPD management at primary, secondary and tertiary levels of healthcare system for equitable access and delivery of health services which are locally contextual

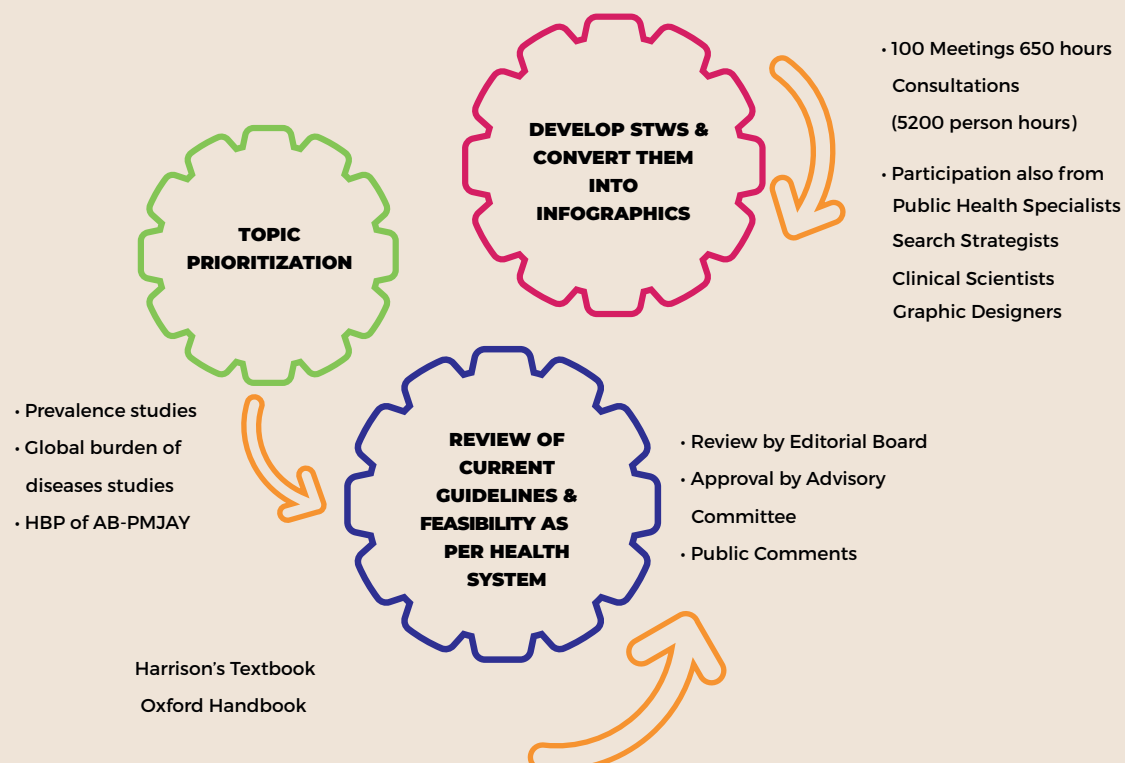
Secondary Objective:

To facilitate PMJAY arm of Ayushman Bharat with secondary and tertiary level management of all surgical and medical conditions covered under the scheme.

METHODOLOGY

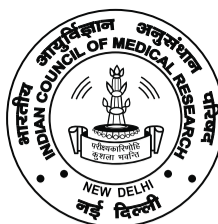


PROCESS OVERVIEW





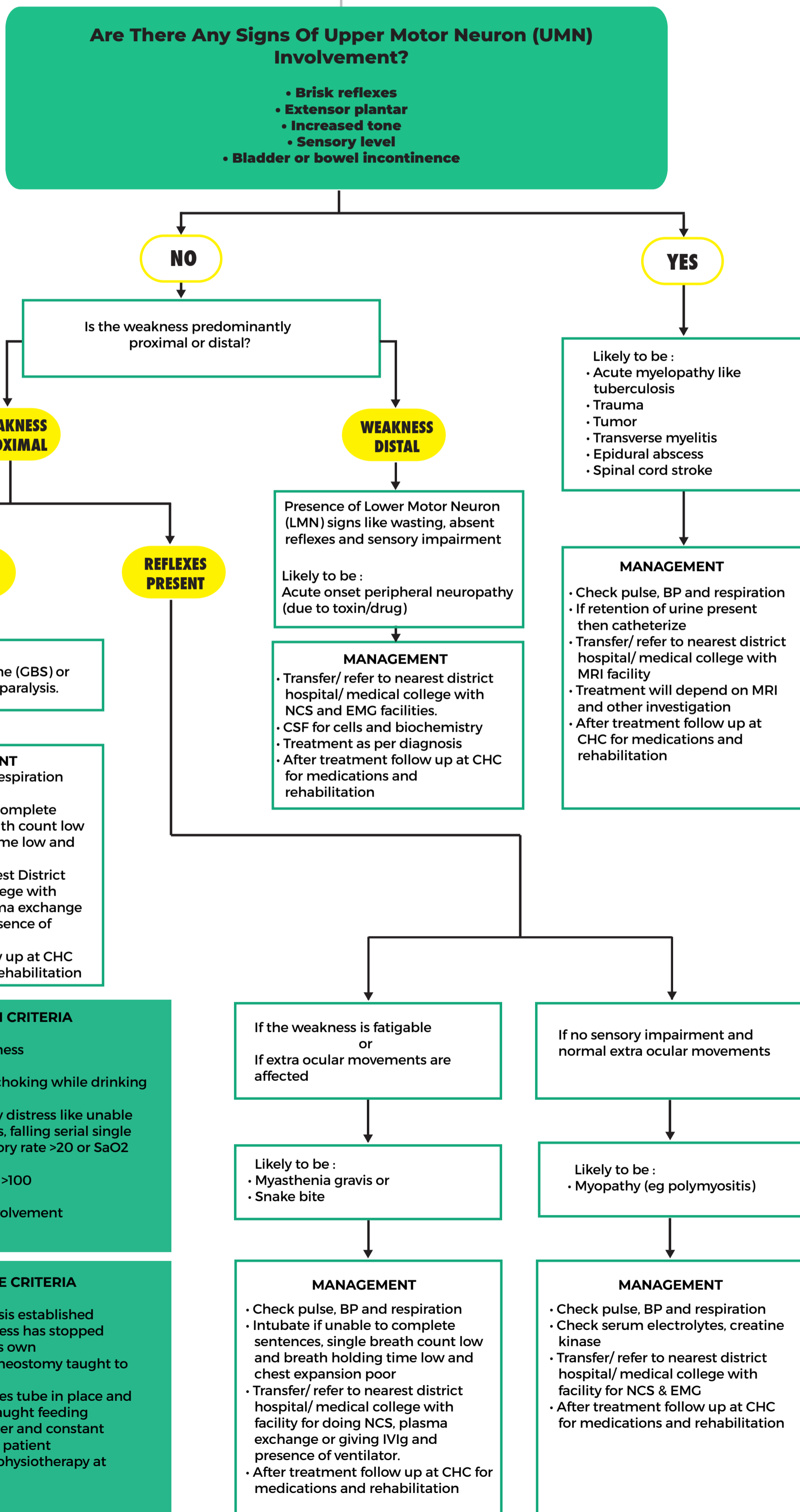
NEUROLOGY



Standard Treatment Workflow (STW) for the APPROACH TO ACUTE PARALYSIS

ICD 10 G82, G83

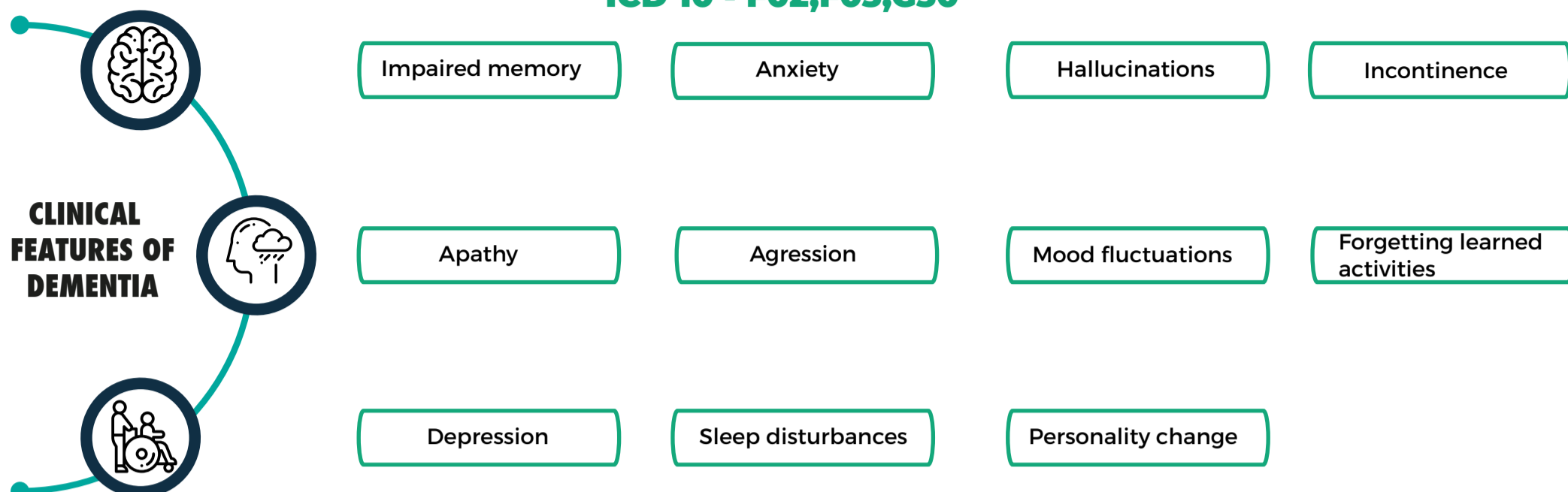
PRESENTATION WITH ACUTE ONSET (WITHIN HOURS TO DAYS) PARAPLEGIA OR QUADRIPLEGIA



👉 **KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES**



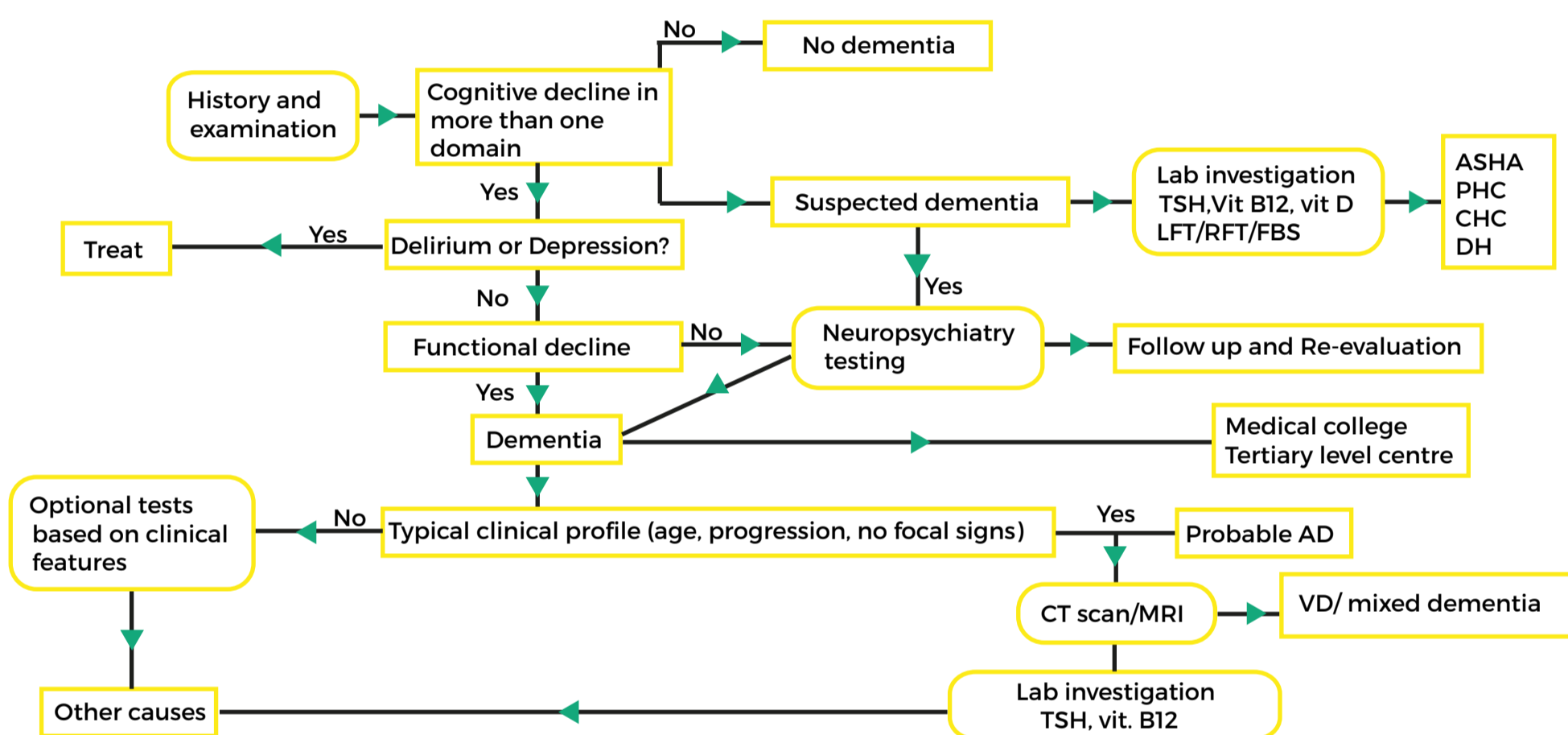
Standard Treatment Workflow (STW) for the Management of **DEMENTIA** ICD 10 - F02,F03,G30



IMPORTANT POINTS TO CONSIDER

- Dementia is a complex and variable condition
- No single test will definitively diagnose dementia
- The clinical features if present, should be a change from baseline normal functioning in a middle aged to old person
- Assessment should aim at gathering information about changed behaviours, functional capacity, psychosocial support and medical comorbidities
- History should be taken from a close caregiver, staying with the patient for a longer duration than the appearance of symptoms

EVALUATION OF DEMENTIA



FOLLOW UP OF DIAGNOSED & TREATED PATIENTS INTERVENTION MATRIX FOR DEMENTIA ACROSS PLATFORMS OF CARE

PRIMARY HEALTH CENTRE (MEDICAL OFFICER)

- Diagnose dementia after detailed history
- Screening for:
 - Treatable causes of dementia - thyroid disorders, B-12 deficiency, subdural hemorrhage.
 - Depression.
 - Vascular risk factors
- Lab investigations- CBC, biochemistry, liver function tests, hemogram, lipid profile, TFT, VDRL, vit B12 level, vit D level
- Referrals for MRI/CT
- Initiation of treatment/drugs; treatment for co-morbid conditions (including depression, vision, hearing deficits and gait problems), thyroid, arthritis.
- Initiate therapy for vascular risk factors
- Encourage healthy lifestyle
- Assess for palliative care
- Learn and share facts about dementia to provide immediate need to the person with severe dementia
- Follow up and monitor for side effects of drugs/ red flags in patient/ signs of danger
- Follow-up of difficult patients under the guidance of higher centre.

DISTRICT HOSPITAL (SPECIALIST- PHYSICIAN/ GERIATRIC SPECIALIST/ NEUROLOGIST/ PSYCHIATRIST)

- Careful evaluation of all the referral patients of dementia
- Screening for treatable causes for dementia including normal pressure hydrocephalus, B12 deficiency, hypothyroidism, chronic meningitis
- Neuroimaging CT/MRI- to rule out subdural hematoma/ tumors/ NPH(surgically remediable causes of rapid cognitive decline)
- Lab investigations- CBC, liver function tests, biochemistry, hemogram, lipid profile, vit D levels, TFT, VDRL, retrovirus after counselling (whenever feasible and high index of suspicion)
- All the points mentioned in PHC to be followed if patient presents to a DH
- Upward referral linkages with tertiary care and downward referral with PHC.
- Encouraging patient and caregiver participation in an ongoing support program for them.
- Avoid antipsychotics until necessary
- Interaction with, training of MOs at PHC/UPHC and ongoing clinical support and supervision

REASONS FOR REFERRAL

- Not responding to adequate dose and duration of prescribed medications
- Presence of red flags

RED FLAGS

- Fever
- Rapid progression
- Seizures
- Recent head injury
- Alcoholism and falls

MEDICATIONS RECOMMENDED FOR USE FOR ALZHEIMERS DEMENTIA

FOR COGNITION

- **Donepezil:** 5 mg once after breakfast x 1 month, then 10 mg after breakfast to continue
If any side effect/ not tolerating: **Rivastigmine** to be used start dose 1.5 mg BD / 1 month then 3 mg BD x 1 month, then 4.5 mg BD x 1 month, then 6 mg twice after meals only x 1 month.
- **Memantine:** in moderate to severe dementia 5 mg BD x 1 month, then 10 mg BD to continue.
- **Galantamine:** 8 mg BD if not tolerating 1

FOR DEPRESSION

- Escitalopram 10 mg

FOR AGITATION

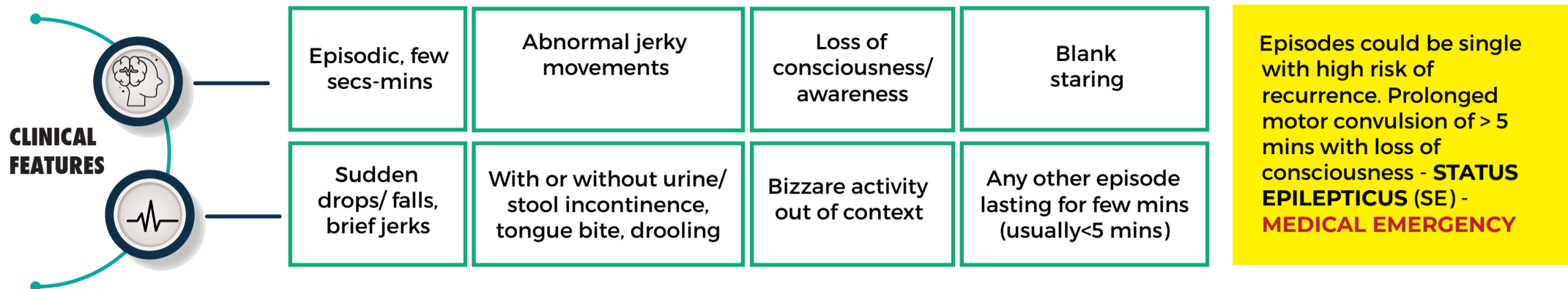
- Identification of triggers
- Non pharmacological interventions

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES



Standard Treatment Workflow (STW) for the Management of EPILEPSY

ICD 10 - G40



PRIMARY HEALTH CENTRE (MEDICAL OFFICER)

- Clinical diagnosis of epilepsy: detailed history from an eyewitness
- Differentiate between provoked seizures and epilepsy (provoked due to fever, acute CNS insult, antibiotics, and metabolic causes)
- Laboratory investigations:** CBC, liver function tests, routine biochemistry, hemogram, lipid profile, vit D levels, TFT (whichever feasible)
- Initiation of treatment:**
 - Treat the patient if patient has epilepsy (2 or more episodes of unprovoked seizures)
 - Treat a single seizure if risk of recurrence is high as in patients with focal seizures, mentally retarded, neurological deficits having family history of seizures abnormal EEG, neuroimaging
 - Anti Epileptic Drug (AED broad spectrum, low dose, start low go slow, except status epilepticus)
 - Emergency medical care of status epilepticus
- Treatment counselling:** side effects/toxicities of drugs, red flags, importance of adherence, maintaining treatment diary
- Advice on prevention of seizures:** regular medication, sleep 7-8 hrs, avoid excess TV/mobile/ photic stimulation, regular diet, lifestyle choices (avoid alcohol)
- Evaluate any possibility of superimposed non-epileptic seizure
- Training of MLP/ANM/ASHA on epilepsy
- For excessive alcohol use, refer to ANM/MLP where psychosocial interventions are carried out for substance use disorders
- Follow up visits for treatment monitoring & difficult patients under neurologist at STC centre
- Basic management of co-morbidities (behaviour, cognition, reproductive health, bone health)
- Alert to signs of abuse and neglect
- Maintain upward referrals with paediatrician/physician at DH

REASONS FOR REFERRAL

(centres with specialists like paediatrician, neurologist)

- Redflag Signs
- Progressive problems, rapid appearance of new symptoms
- Recent injury
- Symptoms appearing after alcohol binge
- Status epilepticus after stabilization
- Non response to adequate dose and duration of medication
- Serious side effects
- Neuroimaging

RED FLAG SIGNS

- Fever
- Headache
- Vomiting
- Altered Sensorium
- Severe Giddiness
- Loss of function of body

DISTRICT HOSPITALS

- Careful evaluation of all referral patients, provide specialized management for patients and refer back to PHC for follow up of management
- Maintain communication, ongoing clinical support and supervision of MOs at PHC
- Laboratory investigation**
 - CBC, liver function tests, antiepileptic drug levels, routine biochemistry, hemogram, lipid profile, vit D levels, TFT, CT brain (when necessary)
- Monitor side effects of AED
- Clinical Psychologist: counselling health services for persons with epilepsy or upon referral from PHC/UPHC

AED- BROAD SPECTRUM (GENERALIZED SEIZURES)

Sodium Valproate (avoid in women of child bearing age unless non responsive to other drugs)

DOSE (MAINTENANCE: MG/D)

Starting dose :200mg TDS
Maintenance Dose: 600-2400

ADVERSE EFFECTS

Anorexia, wt gain, nausea, vomiting, tremors, hair loss, PCOS, thrombocytopenia

Lamotrigine

Starting dose: 25mg HS (Lower dose with VPA)
Maintenance Dose: 100-300

Sedation, ataxia, dizziness, skin rash, SJS (lower risk with slow titration)

Levetiracetam

Starting dose: 250mg BD
Maintenance Dose: 1000-3000

Somnolence, dizziness, cognitive slowing, psychosis

Topiramate

Starting dose: 25mg OD
Maintenance Dose: 100-400

Sedation, somnolence, cognitive problems, weight loss, word finding difficulty, renal stones, seizure worsening

AED (focal seizures)

Carbamazepine

Starting dose: 100mg BD
Maintenance dose: 400-1200

Sedation, dizziness, ataxia, skin rash, SJS, hyponatremia, seizure worsening in some situations

Oxcarbazepine

Starting dose: 150mg BD
Maintenance dose: 600 to 1800

Sedation, dizziness, ataxia, headache, hyponatremia, skin rash

Phenobarbitone

Can be used for generalized also

Starting dose: 30mg HS
Maintenance dose: 60-180

Sedation, ataxia, depression, memory problems, hyperactivity in children, skin rash

Phenytoin

Starting dose: 200mg HS
Maintenance dose: 200-400

Ataxia, sedation, gum hyperplasia, coarsening of facial features, hirsutism, memory problems, osteomalacia & bone loss, skin rash

Folic Acid 5 mg/day to be added along with AEDs in all women of child bearing age. Polytherapy and valproate to be avoided in women with epilepsy

IMPENDING SE

5 MIN

FIRST ABCS TO BE DONE FROM WHEN YOU SEE PATIENT SIMULTANEOUSLY WITH MEDICATION

ESTABLISHED SE

30 MIN

REFRACTORY SE

60 MIN 2 IV drugs fail (Benzo + IV AED)

Out of Hospital/home : **Buccal/Intranasal IMDZ** with acute repetitive seizures/status (0.3-0.5 mg/kg)

ICU
IV Midazolam loading 0.2 mg/kg
OR CIV 0.05-0.5 mg/kg/hr
(can go up to 2 mg/kg/hr)
Taper gradually after seizure stops
(preferably as evidenced by EEG)

EMERGENCY ROOM

IV Lorazepam up to 0.1 mg/kg @ 2mg/min
OR
IV Midazolam 0.1-0.2 mg/kg bolus or 0.05-0.5 mg/kg/hr in CIV
OR
IV Diazepam upto 0.25-0.4 mg/kg over 2-3 min

Thiopental 5-7 mg/kg IV bolus
further 50 mg until seizures controlled
3-5 mg/kg/hr for only 48 hours

- Phenytoin @50 mg/min 20 mg/kg repeat plus 10 mg/kg if seizures do not stop in 15-20 min
- If seizures not controlled or contra indication (CI) to PHT
- Intravenous Valproate 25-40 mg/kg @3-6 mg/kg/min
- If CI to above two; Phenobarbitone 20 mg/kg IV @ less than 5-60 mg/min but be prepared to Intubate and ventilate

OR Propofol IV loading 2-5 mg/kg
CIV 1-15 MG/KG/HR
OR Pentobarbital IV upto 10 mg/kg @ <0.2-0.4 mg/kg/min CIV 0.5-2 mg/kg/h
OR Ketamine bolus 1.5 mg/kg
CIV 0.01-0.05 mg/kg/h max 10mg/kg/hr * to be EEG Monitoring

Levetiracetam 20-30 mg/kg IV at 5 mg/kg/min (max 3g) or
Levetiracetam 1500-3000 mg via NGT or
Lacosamide 200-400 mg IV at 40-80 mg/min
Topiramate 150-800 mg bid via NGT

Super refractory > 24hr no control

Airway, blood pressure, temperature, intravenous access, electrocardiography, CBC, glucose, electrolytes, AED levels, ABG, oximetry, tox screen, central line
If alcoholic- thiamine & glucose, if diabetic GLUCOTEST/blood sugar & glucose IV. MUST INFORM CONSULTANT ON CALL

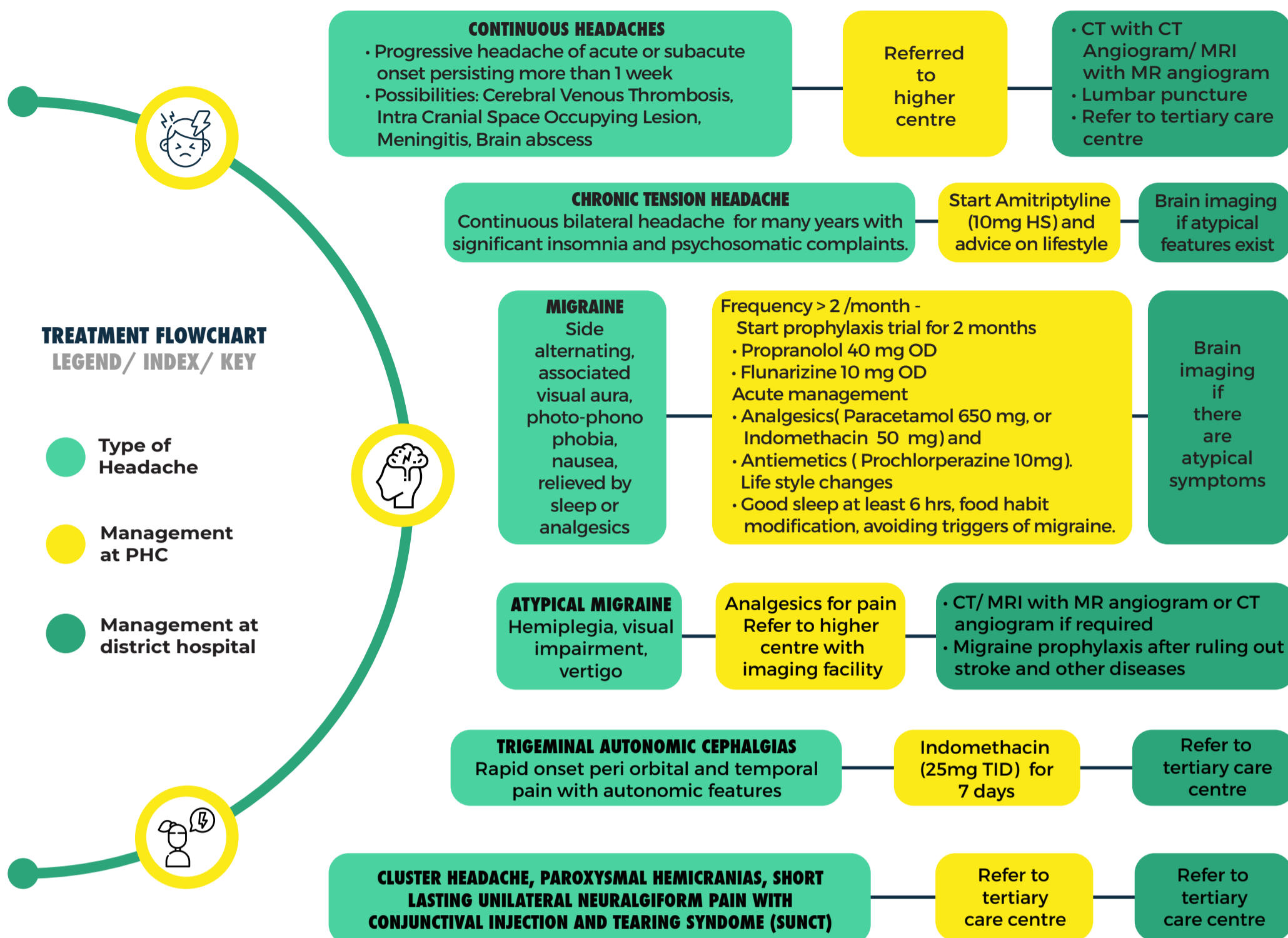
KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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Standard Treatment Workflow (STW) for the Management of HEADACHE

ICD-10-G43-44



- RED FLAG SIGNS**
- First or worst headache of the patient's life
 - Focal neurologic signs (not typical aura)
 - Severe headache awakening from sleep

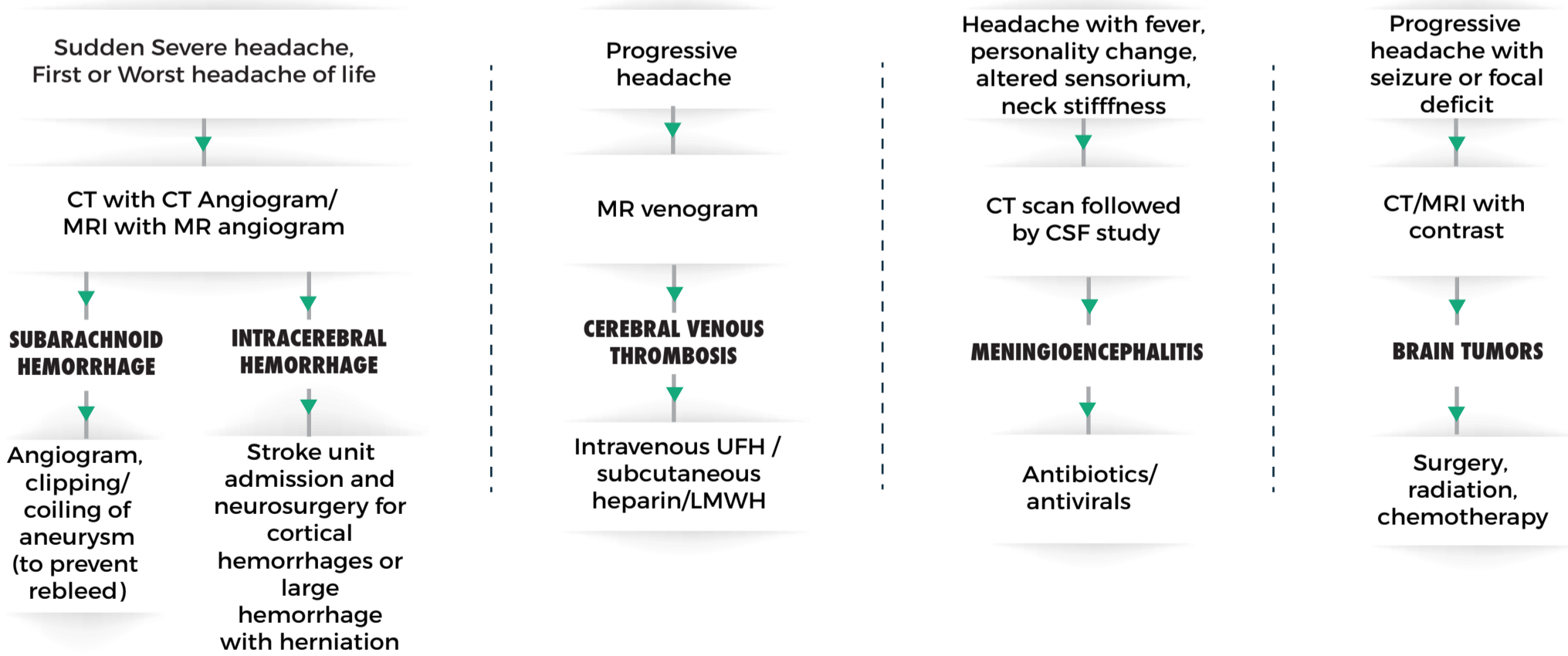
- Headache with fever, change in personality, mental status, level of consciousness
- Fever, neck stiffness or meningism
- New onset of severe headache in pregnancy or postpartum or while on hormone treatment

- Rapid onset with strenuous exercise
- Sudden onset (maximal intensity occurs within seconds to minutes, thunderclap headache)
- New headache type in a patient with malignancy or immunosuppression

REASONS FOR REFERRAL

- Non responding headaches
- Headaches with danger signs should be immediately referred and investigated for potentially dangerous conditions

TREATMENT OF MAJOR CATASTROPHIC HEADACHES AT TERTIARY CENTRE



INDICATIONS FOR ADMISSION

- Patient with unrelenting headache
- Immunosuppressed patients with continuous headache,
- First ever headache with worsening intensity,
- Progressive headache with other systemic disease
- Severe symptomatic primary headache disorders

CRITERIA FOR DISCHARGE

- Primary headache disorders- symptomatically improved severe episode of headache due to primary headache disorder can be discharged
- Secondary headache disorders- secondary headache disorders with essential work up, diagnosis and treatment as per individual case can be discharged

FOLLOW UP OF HEADACHE PATIENTS

CAUSES OF HEADACHE	TREATMENT OF HEADACHE
Intra cerebral hemorrhage	Good control of blood pressure
Seizures	Antiepileptic medications
Cerebral venous sinus thrombosis	Follow up of anticoagulation
Migraine	Give prophylaxis for adequate duration of time and taper after remission

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

REFERENCES

- Hainer BL, Matheson EM. Approach to acute headache in adults. American family physician. 2013 May 15;87(10).
- <https://www.uptodate.com/contents/evaluation-of-headache-in-adults>

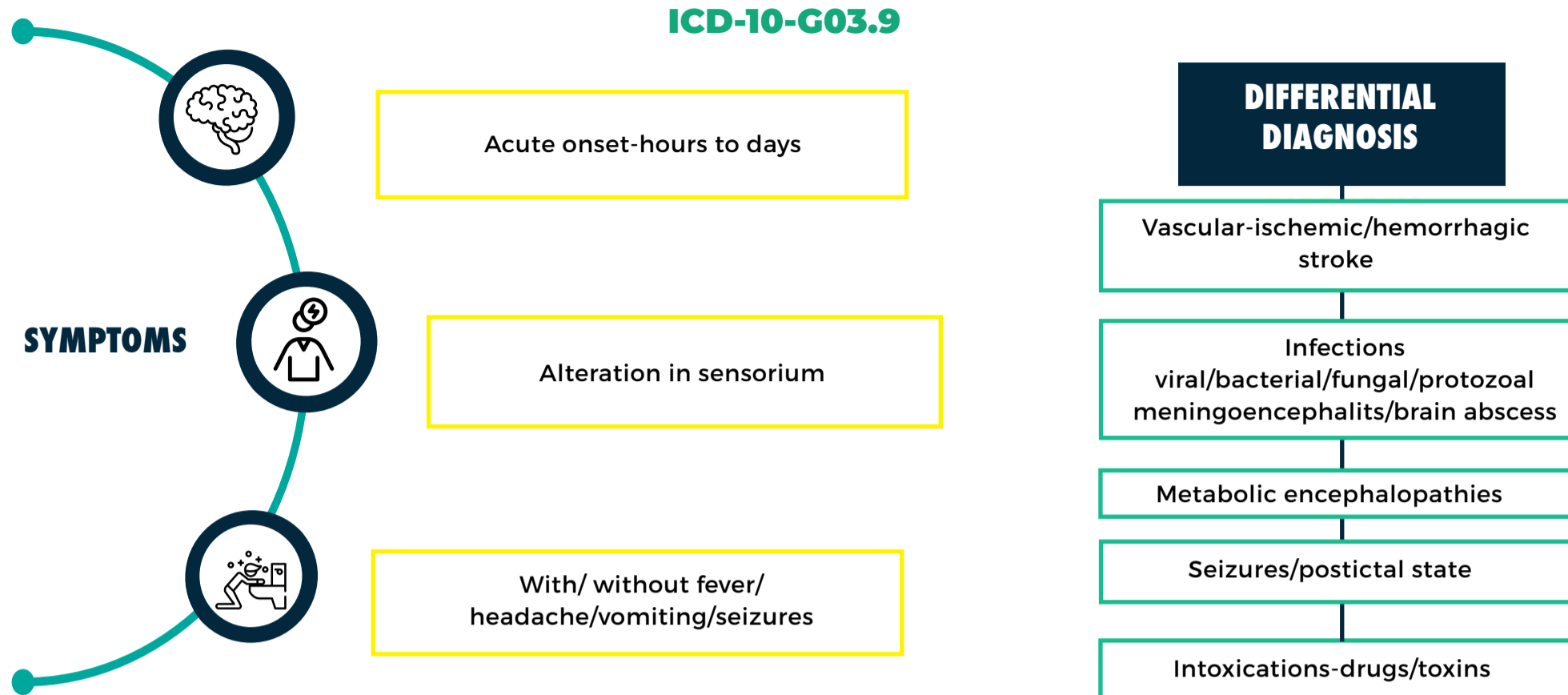
ABBREVIATIONS

CSF: Cerebrospinal Fluid, UFH: Unfractionated Heparin, LMWH: Low Molecular Weight Heparin



Standard Treatment Workflow (STW) for the Management of NEUROINFECTIONS

ICD-10-G03.9



AT PRIMARY CARE LEVEL

ESSENTIAL

Check Airway/Breathing/Circulation

Rule out circulatory shock, ongoing convulsions and hyperthermia/hyperpyrexia(core temperature > 40.5°C or hypothermia(< 36.5°C)

Establish IV access-urgent blood for hemogram/sugar/electrolytes/malaria testing-peripheral smear/rapid antigen detection

Correct hypoglycemia (blood sugar 50 mg/dl) with IV 100ml of 25% dextrose solution

If seizing- IV/IM Lorazepam 0.1 mg/kg followed by loading with Phenytoin 20 mg/kg weight at a rate of 50 mg/minute

When IV access not available-intra nasal or buccal Midazolam 0.2 mg/kg /intra rectal Diazepam 0.3-0.4 mg/kg

Urgent referral to higher centres with intensive care facilities

NOT RECOMMENDED

- Stomach wash
- Inj Mannitol
- Inj Steroids

CRITERIA FOR REFERRAL

Altered sensorium/seizures /focal deficits/hemodynamic instability -where imaging and ICU management are required.

AT SECONDARY CARE LEVEL(TALUK, DISTRICT) HEADQUARTERS HOSPITAL

ESSENTIAL

In addition to all the steps given above :

Establish and maintain airway: Intubate if GCS<8, impaired airway reflexes, abnormal respiratory pattern, signs of raised ICP, oxygen saturation <92% despite high flow oxygen, and fluid refractory shock

Inj Thiamine 100 mg IV

Stomach wash/activated charcoal administration-if history or suspicion of drug overdose/ non corrosive poison intake

Start treatment for cerebral malaria-first dose of IV Artesunate 2.4 mg/kg OR Quinine 20 mg/kg bolus

Emergency CT/referral to centre with 24 hour CT facilities

DESIRABLE

- Neuroimaging-CT with contrast -to rule out hemorrhage/infarcts/focal edema or lesions
- Blood cultures aerobic/anaerobic
- First dose of empirical treatment of pyogenic meningitis-Inj Ceftriaxone 2 g + Inj Vancomycin 500 mg.
- Add Inj Ampicillin 2 g if older than 50 years / immunocompromised along with Inj Dexamethasone 8 mg
- Fundus examination,CSF study to rule out meningoencephalitis-if imaging rules out any mass lesions/herniations.
- Urgent referral to higher centres with Intensive care facilities

CRITERIA FOR REFERRAL

- Altered sensorium/seizures/focal deficits/hemodynamic instability -where imaging and ICU management are required.
- If no definite diagnosis achieved after preliminary investigations

AT TERTIARY CARE HOSPITALS-SELECTED DISTRICT HOSPITALS/MEDICAL COLLEGES

- Neuroimaging-MRI/CT with contrast to rule out abscess/herniations.
- If abscess-emergency neurosurgical consultation for favour of aspiration -open/stereotactic
- Blood cultures-aerobic/anaerobic
- CSF analysis-biochemistry/cytology/gram staining/culture-bacterial , AFB and fungal/viral PCR/TB-PCR/fungal antigen

Empirical antibiotic (within 30 minutes of arrival)

- If suspecting pyogenic meningitis-Inj Ceftriaxone 2 g+ Inj Vancomycin 500 mg+ Inj Ampicillin 2 g if older than 50 years or immunocompromised+ Inj Dexamethasone 8 mg IV
- Continue empirical treatment till culture yields causative organism,then tailor treatment as per sensitivity reports for 10-14 days.
- Steroids to be stopped after 48 hours,unless any other compelling indications-adrenal insufficiency/TBM

Viral-Herpes simplex/Zoster

- Inj Acyclovir 500 mg IV 8 hourly for 10 days

Cerebral malaria

Inj Artesunate 2.4 mg/kg IM or IV 3 doses 12 hours apart and then OD / Inj Quinine 20 mg/kg IV stat followed by 10mg/kg TDS till patient can take orally,then oral Artesunate+Pyrimethamine /Sulphadoxine for 3 days OR oral Quinine 10 mg/kg TDS for total 7 days + Doxycycline 3 mg/kg OD for 7 days.

COMPLICATIONS

Raised ICP

SIADH

Vasculitis

Hydrocephalus

*If uncomplicated-back referral to Secondary care centre for completing treatment regimen/monitoring.

CRITERIA FOR DISCHARGE

Afebrile,hemodynamically stable,seizure free >48 hrs

Diagnosis and treatment plan made and initiated.

Continuation of treatment with monitoring can be ensured for the prescribed duration.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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Standard Treatment Workflow (STW) for the Management of

STROKE

ICD-10-I63, I64

WHAT IS STROKE?

An episode of neurological dysfunction caused by focal cerebral, spinal, or retinal infarction or haemorrhage

SYMPTOMS

- Numbness or weakness, especially on one side of the body
- Loss of consciousness or altered consciousness
- Decreased vision in one or both eyes
- Language difficulties, either in speaking or understanding
- Difficulty walking; loss of balance or coordination
- Confusion or loss of memory
- Swallowing difficulties
- Paralysis of any part of the body, including face
- Sudden, severe headache with no known cause
- Neck pain
- Nausea and vomiting

WARNING SIGNS (BEFAST)

- **BALANCE** : Loss of balance or coordination
- **EYES** : Sudden blurred or double vision/ sudden, persistent vision trouble
- **FACE** : Deviation at the angle of the mouth
- **ARM** : Arm Drift
- **SPEECH** : Slurred speech or the inability to speak or understand
- **TIME** : Act fast
- Sudden new onset of headache or loss of consciousness
- Sudden giddiness, vomiting and imbalance

TYPES OF STROKE

Ischemic stroke Focal cerebral, spinal, or retinal infarction	Intracerebral haemorrhage Focal collection of blood within the brain parenchyma or ventricular system that is not caused by trauma	Subarachnoid haemorrhage Bleeding into the subarachnoid space	Cerebral venous thrombosis Thrombosis of a cerebral venous structure	Transient Ischemic Attack (TIA) Transient episode of neurologic dysfunction caused by focal cerebral, spinal cord, or retinal ischemia, without acute infarction
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PRELIMINARY MANAGEMENT

- Assess and manage ABCs
- Initiate cardiac monitoring
- Maintain O₂ saturation >94%
- Establish IV access
- Determine blood glucose and treat accordingly
- Determine time of symptom onset or last known normal, and obtain family contact information, preferably a cell phone
- Triage and RAPID TRANSFER of patient to nearest district hospital with CT Scan facility or Stroke center with facility for thrombolysis
- Referral hospital to be notified to handle the referred patient with stroke

INVESTIGATIONS

ESSENTIAL

- CT Scan head
- ECG
- Blood Sugar
- Lipids
- Renal parameter

DESIRABLE

- CTA
- Echocardiogram

OPTIONAL

- MRI/MRA
- Holter monitoring

MANAGEMENT

STROKE ONSET TIME: <4.5 HOURS

ISCHEMIC: *

IV tPA (0-4.5 hrs) or endovascular treatment according to eligibility and availability

HAEMORRHAGIC:

- Dysphagia assessment,
- Blood pressure/blood sugar monitoring and IV fluids.
- Prevention of Pneumonia
- Prophylaxis for deep venous thrombosis etc, monitor and record ECG

* RECOMMENDED DIAGNOSTIC STUDIES

ALL PATIENTS

- Noncontrast brain CT or brain MRI
- Blood glucose
- Oxygen saturation
- Serum electrolytes/renal function tests
- Complete blood count, including platelet count
- Markers of cardiac ischemia
- BT, CT, Prothrombin time/INR
- Activated partial thromboplastin time
- ECG
- FLP and carotid doppler (ischemic stroke)

SELECTED PATIENTS

- TT and/or ECT if it is suspected the patient is taking direct thrombin inhibitors or direct factor Xa inhibitors
- Liver function tests
- Toxicology screen
- Blood alcohol level
- Pregnancy test
- Arterial blood gas test (if hypoxia is suspected)
- Chest radiography (if lung disease is suspected)
- Lumbar puncture (if subarachnoid hemorrhage is suspected and CT scan is negative for blood)
- Electroencephalogram (if seizures are suspected)

STROKE ONSET TIME: >4.5 HOURS

Rapid Assessment, CODE Stroke, Blood pressure and Blood Sugar monitoring, NIHSS, Intravenous lines Endovascular treatment with Mechanical thrombectomy using stent retriever (4.5 hrs to 24hrs) according to eligibility

SECONDARY PREVENTION

Aspirin (in ischemic stroke)
 Antihypertensives
 Antidiabetics
 Lipid lowering agents

REHABILITATION

Physiotherapy
 Speech Therapy
 Occupational Therapy
 Vocational training

DISCHARGE PLANNING

(checklist : drugs, diet, compliance, exercises, health education)

FOLLOW UP at 2nd week, 1st month, 3rd month and 6th month

STROKE UNIT MANAGEMENT

- Medical and Nursing staff : control of blood pressure; control of diabetes; swallow assessment; DVT prophylaxis; antiplatelet drugs
- Rehabilitation staff:
 - » Acute phase: basic bed mobility, transfer techniques, communication training, prevention of complications
 - » Subacute and chronic phase: mobility, gait and balance training, training of activities of daily living (grooming, eating, dressing etc), bowel/bladder training, perceptual and cognitive rehabilitation, provision of assistive devices.

KEEP A HIGH THRESHOLD FOR INVASIVE PROCEDURES

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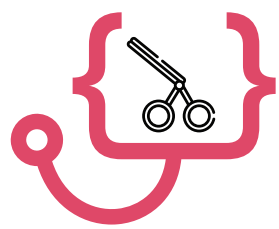
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