TNPCIAPM Newsletter

TN and Pondicherry Chapter of Indian Association of Pathologist and microbiologist

Issue: 2 Sep-Dec 2022

REPORT ON PAST EVENTS ORGANIZED UNDER TNPCIAPM

The WHO Classification of Tumours and its Future Direction

The Department of Pathology, **Sri Ramachandra Medical College** and under the aegis of Tamil Nadu and Pondicherry – IAPM conducted a webinar "***The WHO Classification of Tumours and its Future Direction***" through the online platform on June 9th 2022, from 1:30pm – 2:30 pm. ***Guest speaker was Dr. Ian A Cree, Head, WHO Classification of Tumours Group; Head, Section of Evidence Synthesis and Classification, International agency for Research and Cancer (IARC), World Health Organization, Lyon, France.*** It was such a delight to have an honorable head of WHO participate as a guest speaker. Dr Ian Spoke about what is new in the recent WHO books and the future WHO books. Around 150 delegates from various countries had attended and it was an enlightening experience.

Best Practices in Transfusion Medicine" in commemoration of World Blood Donor Day

The department of Pathology & Transfusion medicine, **Mahatma Gandhi Medical College and Research Institute,** in association with **Faculty of Allied Health Sciences**, **SBV** University, conducted an International CME on "***Best Practices in Transfusion Medicine***" in commemoration of **"*W'orld Blood Donor Day***" on 10th June 2022 between 9.00 am to 4.00 pm. The speakers were eminent and stalwarts in the field of Transfusion medicine from ***Turkey, United Kingdom*** and ***India***. Nearly 389 delegates, which including MBBS, BSc MLT- AHS students, consultant pathologists and post graduates participated. Online quiz was conducted via Quizizz online platform for B.Sc (MLT) students. E-posters were presented by MLT students, which were judged and three were selected for podium presentation. Winners were awarded cash prizes and certificates. A total of 96 students took part from various institutes in the quiz and e poster competition.

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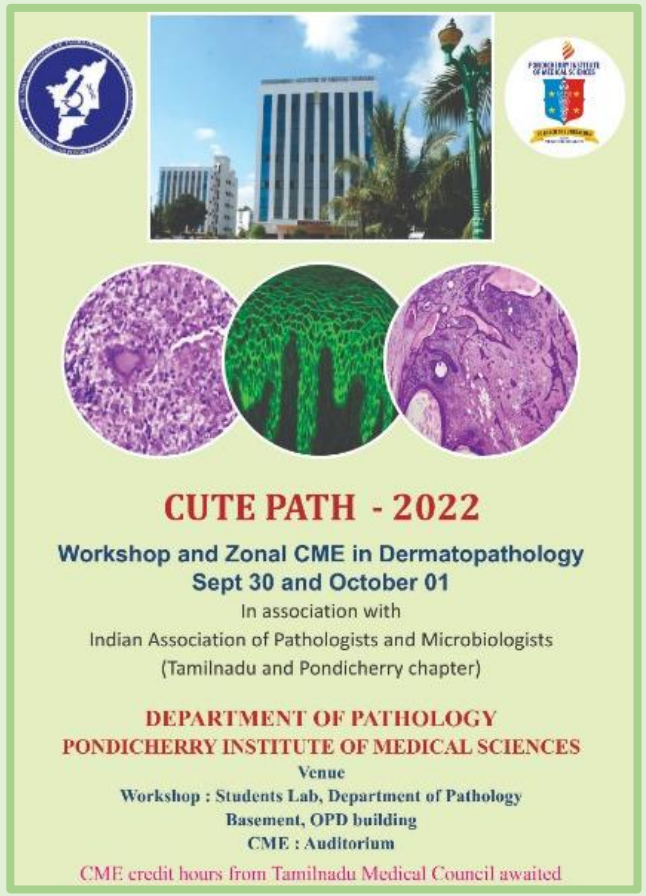
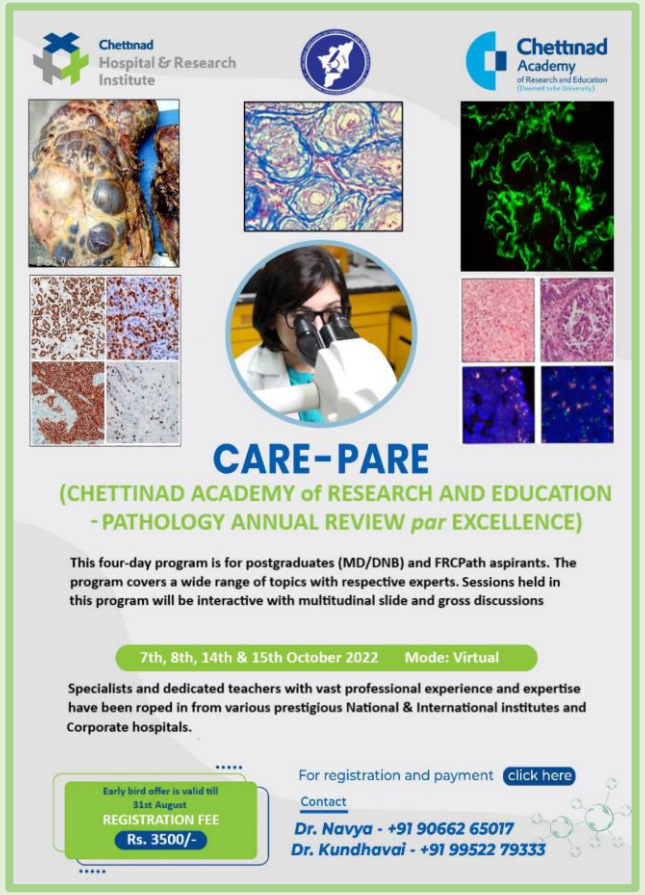
UPCOMING EVENTS TO BE ORGANIZED UNDER TNPCIAPM Sep-Dec 2022





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ANNOUNCEMENT Sep-Dec 2022

TAPCON – THE NEXT ANNUAL CONFERENCE OF TNPCIAM – 2023

WILL BE HOSTED BY CHRISTIAN MEDICAL COLLEGE, VELLORE.

UPDATES ON CNS TUMORS

The definition of new entities based on molecular characteristics & the endorsement of the use of "**integrated" diagnosis that incorporate phenotypic and genotypic information in a layered format.**

Now the Gliomas are entirely modified,

Astrocytomas and oligodendrogliomas are now under the same category ("diffuse astrocytic and oligodendroglial tumors"), which are further defined by the **presence or absence of IDH mutations** fundamentally.

Glioblastomas are divided in the 2016 CNS WHO into

(1) Glioblastoma, IDH-wildtype (about 90 % of cases), which corresponds most frequently with the clinically defined primary or de novo glioblastoma and predominates in patients over 55 years of age.

(2) Glioblastoma, IDH-mutant (about 10 % of cases)

Medulloblastomas are modified with incorporation of molecularly defined entities that determine prognostic aspects.

NOS (not otherwise specified): terminology to be used when molecular information is insufficient, either because testing cannot be fully performed or the results don't fit within a defined category.

New entities are added, such as diffuse midline glioma, H3 K27M mutant, diffuse leptomeningeal glioneuronal tumor and epithelioid glioblastoma.

Some entities - deleted, such as gliomatosis cerebri (now considered a pattern instead of an entity) and "primitive neuroectodermal tumor" (PNET) terminology for embryonal tumors

Brain invasion is added as a criterion for atypical meningioma, WHO grade II

Solitary fibrous tumor and hemangiopericytoma are now considered a **combined diagnosis** (solitary fibrous tumor / hemangiopericytoma)

They are graded 1 - 3 using a soft tissue type grading system.

Nerve sheath tumors are expanded, with incorporation of hybrid nerve sheath tumor and separation of melanotic schwannoma from others.

Grading

- **Histological grading** is still used based **on morphology**, despite the very important prognostic significance of the **molecular characteristics (i.e. IDH mutant vs IDH wild type gliomas)**

In the **clinical setting**, **tumor grade** remains a **key factor** influencing **choice of therapy**.

The 2021 fifth edition introduces major changes

Advance the role of molecular diagnostics in CNS tumor classification with other established approaches to tumor diagnosis such as histology and immunohistochemistry.

Some different approaches to both CNS tumor nomenclature and grading and it emphasizes the importance of integrated diagnoses and layered reports.

New tumor types and subtypes are introduced, some based on novel diagnostic technologies such as DNA methylome profiling.

The present review summarizes the major general changes in the 2021 fifth edition classification and the specific changes in each taxonomic category.

Criteria for assigning meningiomas to CNS WHO grades 2 and 3

These criteria can be used across all meningioma subtypes, except:
CNS WHO grade 2 criteria must be met for atypical meningioma
CNS WHO grade 3 criteria must be met for anaplastic meningioma

CNS WHO grade 2	CNS WHO grade 3
4-19 mitotic figures / 10 HPF* (at least 2.5 per mm^2)	20 mitotic figures / 10 HPF* (at least 12.5 per mm^2)
Unequivocal brain invasion	Frank anaplasia
Chordoid or clear cell histology	TERT promotor mutation
At least three of the following:	CDKN2A and/or CDKN2B homozygous deletion
Increased cellularity	
Small cells with high N:C ratio	
Prominent nucleoli	
Sheeting (patternless growth)	
Spontaneous necrosis	

*One HPF is equivalent to 0.16 mm^2

Grading	Definition
Grade I	- Mitotic count of less than 4 per 10 HPF - Absence of brain invasion - 9 histological subtypes: meningothelial, fibrous, transitional, psammomatous, microcystic, angiomatous, secretory, lymphoplasmacyte-rich, metaplastic
Grade II (atypical)	- Mitotic count of 4 to 19 per 10 HPF - Or presence of brain invasion - Or 3 of 5 specific histological features: spontaneous necrosis, sheeting, prominent nucleoli, high cellularity and small cells - 3 histological subtypes: atypical, clear cells, chordoid
Grade III (anaplastic)	- Mitotic count of 20 or more per 10 HPF - Or specific histologies: rhabdoid or papillary meningioma

CNS Tumor Grading

WHO CNS has moved CNS tumor grading closer to how grading is done for non-CNS neoplasms but has retained some key aspects of traditional CNS tumor grading because of how embedded such grading has been in neuro-oncology practice. Two specific aspects of CNS tumor grading have changed for WHO CNS: Arabic numerals are employed (rather than Roman numerals) and neoplasms are graded *within* types (rather than across different tumor types). Nonetheless, because CNS tumor grading still differs from other tumor grading systems, WHO CNS endorses use of the term "CNS WHO grade" when assigning grade

CNS WHO Grades of Selected Types, Covering Entities for Which There Is a New Approach to Grading, an Updated Grade, or a Newly Recognized Tumor That Has an Accepted Grade.

CNS WHO Grades of Selected Types	
Astrocytoma, IDH-mutant	2, 3, 4
Oligodendroglioma, IDH-mutant, and 1p/19q-codeleted	2, 3
Glioblastoma, IDH-wildtype	4
Diffuse astrocytoma, MYB- or MYBL1-altered	1
Polymorphous low-grade neuroepithelial tumor of the young	1
Diffuse hemispheric glioma, H3 G34-mutant	4
Pleomorphic xanthoastrocytoma	2, 3
Multinodular and vacuolating neuronal tumor	1
Supratentorial ependymoma[a]	2, 3
Posterior fossa ependymoma[a]	2, 3
Myxopapillary ependymoma	2
Meningioma	1, 2, 3
Solitary fibrous tumor	1, 2, 3

Grade is based on natural history and for some tumor types, definite grading criteria and understanding of natural history are not yet known. Note the use of Arabic numerals.

[a]For morphologically defined ependymomas

Layered Report Structure

Integrated diagnosis (combined tissue-based histological and molecular diagnosis)
Histological diagnosis
CNS WHO grade
Molecular information

Layered Report – For Example :

(1) Use of Site in the Diagnosis ;

(2) Use of a Histological Diagnosis That Does Not Designate "Anaplasia" But the Report Still Assigns a Grade;

(3) Use of the NOS Designation (the Case Could Not Be Worked up Adequately at a Molecular Level)

Cerebrum	
Integrated diagnosis	Supratentorial ependymoma, NOS
Histopathological classification	Ependymoma
CNS WHO grade	3
Molecular information	Derivatives extracted from FFPE tissue were of insufficient quality for sequencing and insufficient tissue remained for FISH studies

Note: FFPE – Formalin -fixed paraffin – embedded, FISH – Fluorescence in situ hybridization. NOS – not otherwise specified.

Another Example - Layered Report

(1) A Tumor Type With a Subtype;

(2) Lack of a Definite Grade; and

(3) That the Integrated Diagnosis Does Not Necessarily Have the Histological Designation Included

Cerebrum	
Integrated diagnosis	Diffuse low-grade glioma, MAPK pathway-altered Subtype: Diffuse low-grade glioma, FGFR1 TKD-duplicated
Histopathological classification	Oligodendroglioma
CNS WHO grade	Not assigned
Molecular information	Duplication of the FGFR1 tyrosine kinase domain (next-generation sequencing)

Arabic vs Roman numerals.

Dr.R.Thamilselvi
Professor and Head
VMKVMC, SALEM

Grossing of Renal cell carcinoma specimen

Specimen received

1.Renal core biopsy(needle/wedge)
2.Simple nephrectomy
3.Partial nephrectomy: Robotic, laparoscopic, open
4.Radical nephrectomy: Upfront, Cytoreductive and Post chemotherapy
5.Transplant nephrectomy
6.Nephroureterectomy

Relevant clinical history

1.Clinical details: Upfront or cytoreductive,family history, associated paraneoplastic syndromes
2.Radiological details: Site, size and extent
3.Prior diagnosis: Avoid unnecessary IHC 4.Prior treatment: Post chemotherapy

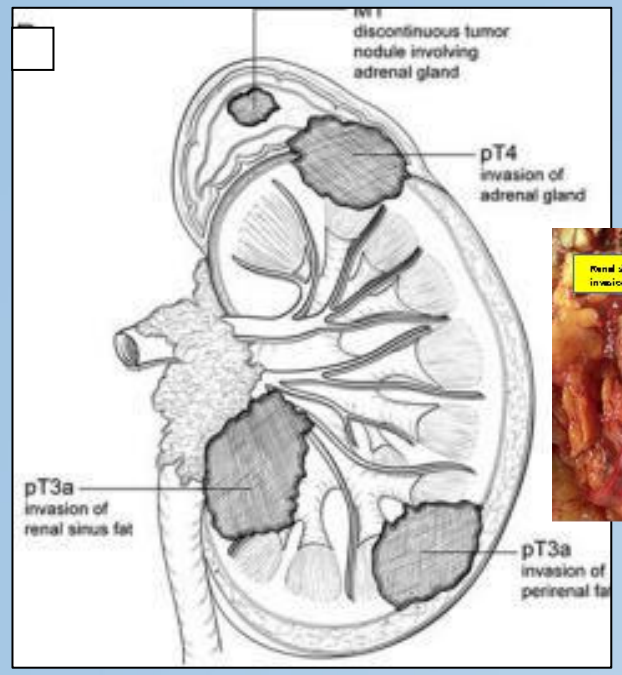
Handling of the kidney specimen

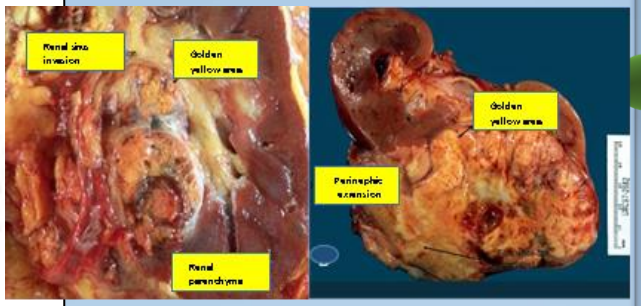
- Weigh the specimen and measure in 3 dimensions
- Identify and measure the length and diameter of the renal vein, renal artery and ureter
- Assess the renal vein and margin for presence of tumour
- Palpate the specimen to locate the tumour and examine the outer surface for evidence of involvement of Gerota fascia
- Ink the outer surface
- Make a longitudinal cut with a long knife along the long axis of the kidney to bivalve the specimen (i.e. open like a book) either from medial to lateral or vice versa
- Serially section the entire specimen at 1 cm intervals, identify the pole (upper, mid, lower) in which the tumour is located and measure the distance of the nearest tumour to the nearest inkedouter surface
- Describe the tumour (colour, consistency) and note the percentage of necrosis
- For multiple discrete tumours that do not connect to each other and have a similar grossappearance, measure and state the location of at least the largest 3 tumours
- If additional similar tumours are present, provide a range of sizes of these tumours and statewhich poles of the kidney are involved
- Assess for areas where the tumour appears to be invading **perinephric fat, renal sinus fat or the pelvicalyceal system**, as this impacts pT classification, and document this in the gross description
- Assess the nonneoplastic renal parenchyma
- Search the superior perirenal fat for an adrenal gland and serially section if identified
- Examine the adipose tissue for lymph nodes, particularly the perihilar area
- Digital photograph of the specimen

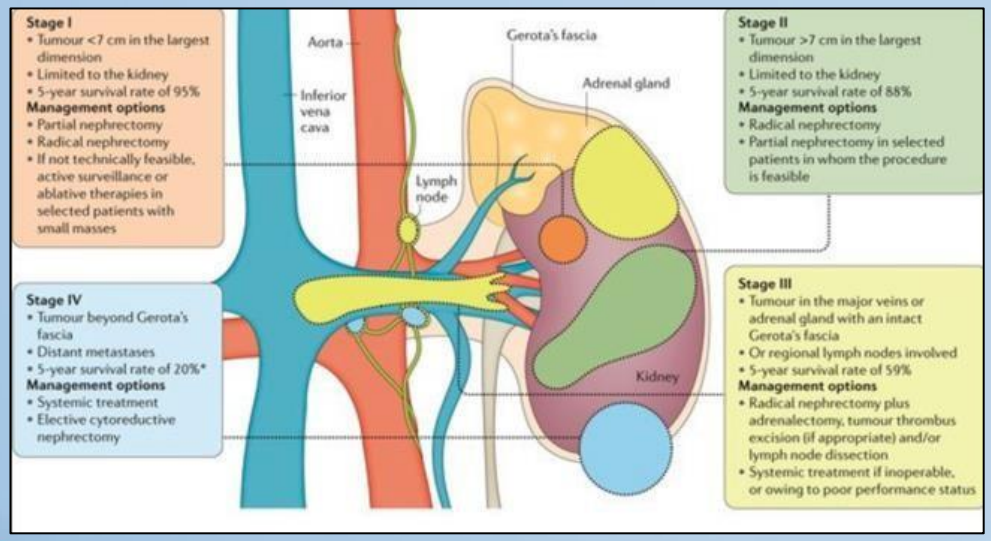
Prognostic factors coordinated by WHO

- Tumor size
- Tumor type
- Tumor grade
- Tumor necrosis
- Sarcomatoid/rhabdoid morphology
- Perivascular invasion, Renal sinus invasion, Microvascular invasion, lymphovascular invasion
- Invasion of pelvicalyceal system
- Involvement of adrenal gland and lymph node and TNM staging

8th edition staging updates and management







Publication/ effective year	AJCC TNM 7th edition 2009/2010	AJCC TNM 8th edition 2016/2018	Changes in 8th edition
pT1a	Organ confined ≤4 cm	Organ confined ≤4 cm	
pT1b	Organ confined 4–7 cm	Organ confined 4–7 cm	
pT2a	Organ confined >7–10 cm	Organ confined >7–10 cm	
pT2b	Organ confined >10 cm	Organ confined >10 cm	
pT3a	Perinephric fat invasion	Perinephric fat invasion	
	Renal sinus invasion	Renal sinus invasion	
	Tumor grossly extends into the renal vein or its segmental (muscle containing) branches	Tumor extends into the renal vein or its segmental branches	"Grossly" and "muscle-containing" removed
		Tumor invades the pelvicalyceal system	New
pT3b	Tumor extends to the vena cava below the diaphragm (without wall invasion)	Tumor extends to the vena cava below the diaphragm (without wall invasion)	
pT3c	Tumor extends to the vena cava above the diaphragm	Tumor extends to the vena cava above the diaphragm	
	Tumor invades the wall of the vena cava	Tumor invades the wall of the vena cava	
pT4	Tumor invades beyond Gerota fascia	Tumor invades beyond Gerota fascia	
	Direct invasion of adrenal gland	Direct invasion of adrenal gland	
pN0	No regional lymph node metastasis	No regional lymph node metastasis	
pN1	Metastasis in 1 or more lymph nodes	Metastasis in 1 or more lymph nodes	
pM1	Distant metastasis	Distant metastasis	
	Non-contiguous adrenal involvement	Non-contiguous adrenal involvement	

AJCC Prognostic Stage Groups

When T is...	*And N is...*	*And M is...*	*Then the stage group is...*
T1	N0	M0	I
T1	N1	M0	III
T2	N0	M0	II
T2	N1	M0	III
T3	N0	M0	III
T3	N1	M0	III
T4	Any N	M0	IV
Any T	Any N	M1	IV

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COMPETENCY BASED ASSESSMENT FOR MD PATHOLOGY – DO WE NEED IT?

Preamble

The purpose of PG education is to create specialists who would provide high quality health care and advance the cause of science through research & training.

The training programme should be designed to enable the student to acquire a capacity to learn and investigate, to synthesize and integrate a set of facts and develop a faculty to reason. The curricular programmes and scheduling of postings must provide the student with opportunities to achieve the above broad objectives. Much of the learning is to be accomplished by the student himself. Interactive discussions are to be preferred over didactic sessions. The student must blend as an integral part of the activities of an academic department that usually revolves around three equally important basic functions of teaching, research and service. As mentioned earlier, the emphasis recommended under a PG training programme is of learning while serving/working.

The following are the skills to be acquired during the course of the post graduate programme.

Surgical pathology Skills

Given the clinical and operative data, the student should be able to identify, and systematically and accurately describe the chief gross anatomic alterations in the surgically removed specimens and be able to correctly diagnose at least 80% of the lesions received on an average day from the surgical service of an average teaching hospital.

A student should be able to demonstrate ability to perform a systematic gross examination of the tissues including the taking of appropriate tissue sections and in special cases as in intestinal mucosal biopsies, muscle biopsies and nerve biopsies, demonstrate the orientation of tissues in paraffin blocks.

The student should be able to identify and systematically and accurately describe the chief histo-morphological alterations in the tissue received in the surgical pathology service. He/she should also correctly interpret and correlate with the clinical data to diagnose at least 90% of the routine surgical material received on an average day.

Be conversant with automatic tissue processing machine and the principles of its running.

Process a tissue, make a paraffin block and cut sections of good quality on a rotary microtome.

Stain paraffin sections with at least the following:

(i) Haematoxylin and eosin
(ii) Stains for collagen, elastic fibers and reticulin
(iii) Iron stain
(iv) PAS stain
(v) Acid fast stains
(vi) Any other stains needed for diagnosis.

Demonstrate understanding of the principles of:

(i) Fixation of tissues
(ii) Processing of tissues for section cutting
(iii) Section cutting and maintenance of related equipment
(iv) Differential (special) stains and their utility

Cut a frozen section using cryostat, stain and interpret the slide in correlation with the clinical data provided. Demonstrate the understanding of the utility of various immunohistochemical stains especially in the diagnosis of tumour subtypes.

Cytopathology Skills

Independently prepare and stain good quality smears for cytopathologic examination.

Be conversant with the techniques for concentration of specimens: i.e. various filters, centrifuge and cytocentrifuge.

Independently be able to perform fine needle aspiration of all lumps in patients; make good quality smears, and be able to decide on the types of staining in a given case.

Given the relevant clinical data, he/she should be able to independently and correctly:

Diagnose at least 75% of the cases received in a routine laboratory and categorize them into negative, inconclusive and positive.

Haematology Skills

Correctly and independently perform the following special tests, in addition to doing the routine blood counts:

(i) Haemogram including reticulocyte and platelet counts.
(ii) Bone marrow staining including stain for iron
(iii) Blood smear staining
(iv) Cytochemical characterization of leukemia with special stains like Peroxidase, Leukocyte Alkaline Phosphatase (LAP), PAS, Sudan Black, etc.
(v) Hemolytic anemia profile including HPLC, Hb electrophoresis etc.
(vi) Coagulation profile including PT, APTT, FDP.
(vii) BM aspiration and BM biopsy

Demonstrate familiarity with the principle and interpretation of results and the utility in diagnosis of the following:

(i) Platelet function tests including platelet aggregation and adhesion and PF3 release
(ii) Thrombophilia profile: Lupus anticoagulant (LAC), Anticardiolipin Antibody (ACA), Activated Protein C Resistance (APCR), Protein C (Pr C), Protein S (Pr S) and Antithrombin III (AT III)
(iii) Immunophenotyping of leukaemia
(iv) Cytogenetics
(v) Molecular diagnostics.

Laboratory Medicine Skills

Demonstrate familiarity with and successfully perform:

i) routine urinalysis including physical, chemical and microscopic, examination of the sediment.
ii) macroscopic and microscopic examination of faeces and identify the ova and cysts of common parasites.
iii) a complete examination: physical, chemical and cell content of Cerebrospinal Fluid (C.S.F), pleural and peritoneal fluid.
iv) semen analysis.
v) examination of peripheral blood for commonly occurring parasites.

Independently and correctly perform at least the following quantitative **e**stimations by manual techniques and/or automated techniques.

(i) Blood urea
(ii) Blood sugar
(iii) Serum proteins (total and fractional)
(iv) Serum biIirubin (total and fractional)

Demonstrate familiarity with the following quantitative estimations of blood/ serum by Automated Techniques:

Serum cholesterol, Uric acid, Serum Transaminases (ALT and AST/SGOT and SGPT), etc.

• Prepare standard solutions and reagents relevant to the above tests, including the preparation of normal solution, molar solution and buffers.

• Explain the principles of Instrumentation, use and application of the instruments commonly used in the labs eg. Photoelectric colorimeter, Spectrophotometer, pH meter, Centrifuge, Electrophoresis apparatus, ELISA Reader, flow cytometer, PCR, chemiluminiscence.

Transfusion Medicine Skills

The student should be able to correctly and independently perform the following:

Selection and bleeding of donors

Preparation of blood components i.e. Cryoprecipitates, Platelet concentrate, Fresh Frozen Plasma, Single Donor Plasma, Red Blood Cell concentrates.

ABO and Rh grouping.

Demonstrate familiarity with Antenatal and Neonatal work up.

(i) Direct antiglobulin test
(ii) Antibody screening and titre
(iii) Selection of blood for exchange transfusion

Demonstrate familiarity with principle and procedures involved in:

(i) Resolving ABO grouping problems.
(ii) Identification of RBC antibody.
(iii) Investigation of transfusion reaction.

(iv) Testing of blood for presence of:
(a) HBV (Hepatitis B Virus Markers).
(b) HCV (Hepatitis C Virus Markers)
(c) HIV (Human Immunodeficiency Virus Testing)
(d) VDRL
(e) Malaria

Immunohistochemistry Skills (desirable)

Be able to perform immuno-histochemical staining using paraffin section with at least one of the commonly used antibodies (Cytokeratin or LCA) using PAP method.

TEACHING LERNING ACTIVITIES :

The following is a rough guideline to various teaching/learning activities that may be employed.

- Collection of specimens including Fine Needle Aspiration of lumps.
- Grossing of specimens.
- Performing autopsies.
- Discussion during routine activities such as during signing out of cases.
- Presentation and work-up of cases including the identification of special stains and ancillary procedures needed.
- Clinico-pathological conferences.
- Intradepartmental and interdepartmental conferences related to case discussions.
- Conferences, Seminars, Continuing Medical Education (CME) Programmes.
- Journal Club.
- Research Presentation and review of research work.
- Participation in workshops, conferences and presentation of papers etc.
- Laboratory work.
- Use and maintenance of equipment.

ASSESSMENT

FORMATIVE ASSESSMENT

General Principles

Internal Assessment should be frequent, cover all domains of learning and used to provide feedback to improve learning; it should also cover professionalism and communication skills.

The Internal Assessment should be conducted in theory and practical/clinical examination.
Quarterly assessment during the MD training should be based on:

1. Journal based / recent advances learning
2. Patient based /Laboratory or Skill based learning
3. Self directed learning and teaching
4. Departmental and interdepartmental learning activity
5. External and Outreach Activities / CMEs

Work Place Based Assessment (WPBA) – FOR POSTGRADUATES IN PATHOLOGY

The current assessment pattern in usually based on the knowledge and reasoning skill of the resident and it focuses minimally on the exact skill component. The resident is awarded marks for the correct value of the tests, interpretation of the positive tests and the correctness of the diagnosis in the slide evaluation. Minimal steps are taken for the evaluation of the skill behind a lot of tests which they do in the exams.

As discussed earlier ,the NMC gives a list of skills to be acquired in many divisions of Pathology and it is impossible to assess all of them during the summative examination which is of two days duration. So it becomes vital to assess the residents on various skills he or she is acquiring as they get trained in various divisions of Pathology.

The NMC insists of conducting several formative assessment tests done before they appear for the final summative examinations. Every institute has a unique method of conducting formative examinations. But mostly they are in the form of theory tests and slide tests.

The PG residents learn a lot of skills and these are very vital for them to perform as Competent specialist. Hence, we need to have an inbuilt system of assessment in our PG programme which will assess the residents as they acquire the skill and give them a feed back. The resident will be certified as competent only when they perform the skill as per the standard.

Here we propose a Work Place Based Assessment Techniques to assess the PG residents in Pathology.

WHY Work Place Based Assessment?

- Conforms to the highest level of Miller's Pyramid
- Focus on skills including the necessary soft skills (communication, behavior, professionalism, ethics, attitude)
- Observation (in real situation) and feedback
- Context and content specificity
- Compensates for some shortcomings in the traditional assessment methods
- Alignment of learning with actual working
- Encourages reflective practice
- It mainly focuses on skills
- Highly valid
- Associated with timely, effective feedback and continuous learning
- Student centered & Participatory learning
- Collective reflection on competence or performance
- Contribute to the development of learning plans designed to close the gap between 'where one is' and 'where one ought to be'.

We can use the techniques of Work Place Based Assessment to assess on the areas in which the PG resident has to independently do the procedure like **Operating an Automated Tissue Processing Machine, Cut a frozen section using cryostat, perform fine needle aspiration of a lump in patients, Operating an Automated Hematology analyser, doing a delta check, doing tests for quality assurance, performing a bone marrow aspiration / biopsy on a patient, doing an autopsy** etc.,

The advantage of WPBA is that it is linked with an element of the feedback. The assessor observes the procedure on a check list based systematic manner and gives meaningful feedback to the resident. There are vast scopes for the remedial measures in which the resident understands the lacunae and get trained in it. By this the competency of the PG resident is ensured and it is uniform for all the PG residents in the department.

Another great advantage is that the attitudinal domain can also be assessed. We can assess the communication skill of the resident in explaining the procedure to the patient, getting consent, clear the doubts and apprehension of the patients which is not usually assessed in the summative examination.

When to do Work Place Based Assessment Techniques?

We can make a plan to include Work Place Based Assessment Techniques as **End of the Posting Assessment**. As the resident completes a rotation in a particular division, he or she can take the assessment. Get the feedback and do the remedial if needed. This can be done in addition to the regular theory based and slide based assessment methods.

The Work Place Based Assessment Technique could be incorporated in the PG log book which makes an academic record for the resident. The element of feedback can also be entered in the log book.

We can use simple tools like the **Mini Clinical Exercise [Mini CEX]** for procedures like doing FNAC, Bone marrow aspiration and doing an autopsy

Direct observation of Procedural skills [DOPS] can be used for procedure like Operating an Automated Tissue Processing Machine, cut a frozen section using cryostat, Operating an Automated Haematology analyser & doing a supravital staining procedure.

Another important tool is use of the **Portfolio** as an assessment tool. A portfolio is a collection of a student's work, which provides evidence of the achievement of knowledge, skills, appropriate attitudes and professional growth through a process of self -reflection over a period of time. The portfolio can include Critical Incident Reports and What Was Learned, Reflections on Successes and Difficulties. It can also include the academic achievements like training undergone, paper and poster presentations in various conferences, list of the Clinico pathological sessions attended etc.,. The portfolio can also be made in electronic medium as E Portfolio. It has to be evaluated by the facilitator and feedback should be given.

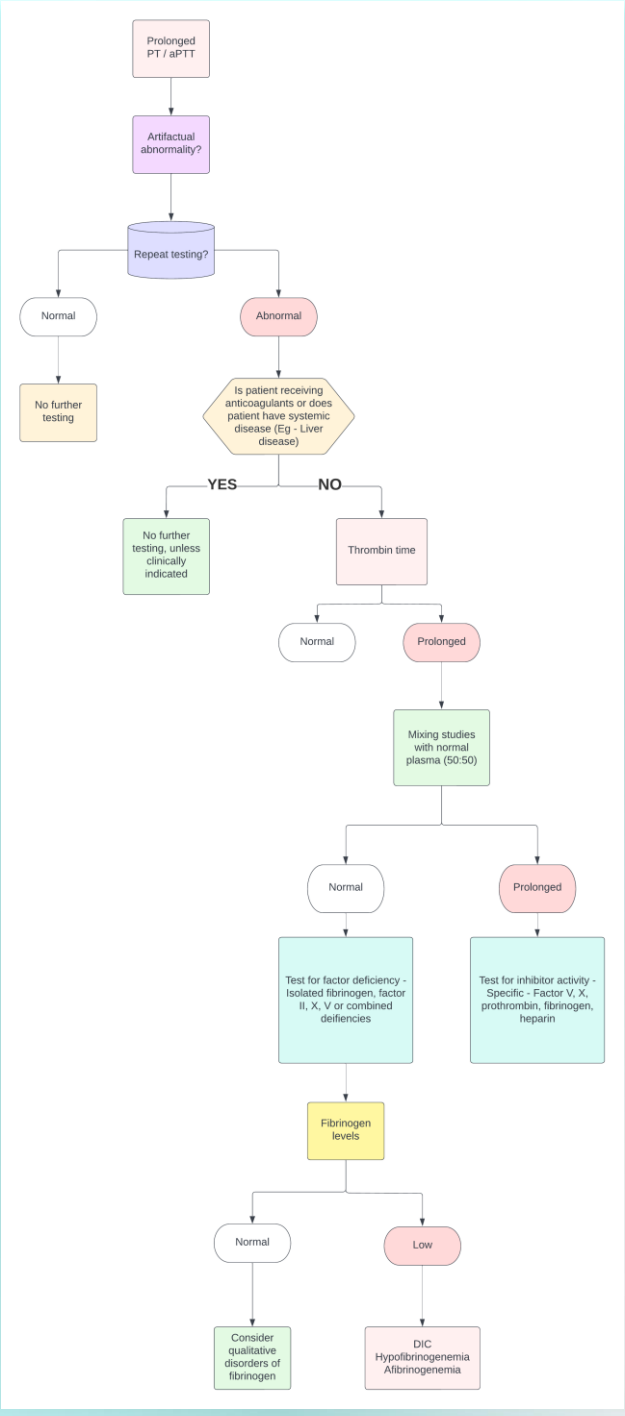
So, friends let us all unite to develop a uniform pattern of Work Place Based Assessment Techniques practiced in all the postgraduate institutions. The critical skills to be assessed have to be finalized and the appropriate assessment tool has to be designed with proper validation.

With this we can assure that all the PG residents are competent to perform the duties of the specialists who would provide high quality health care as told by the National Medical Commission.

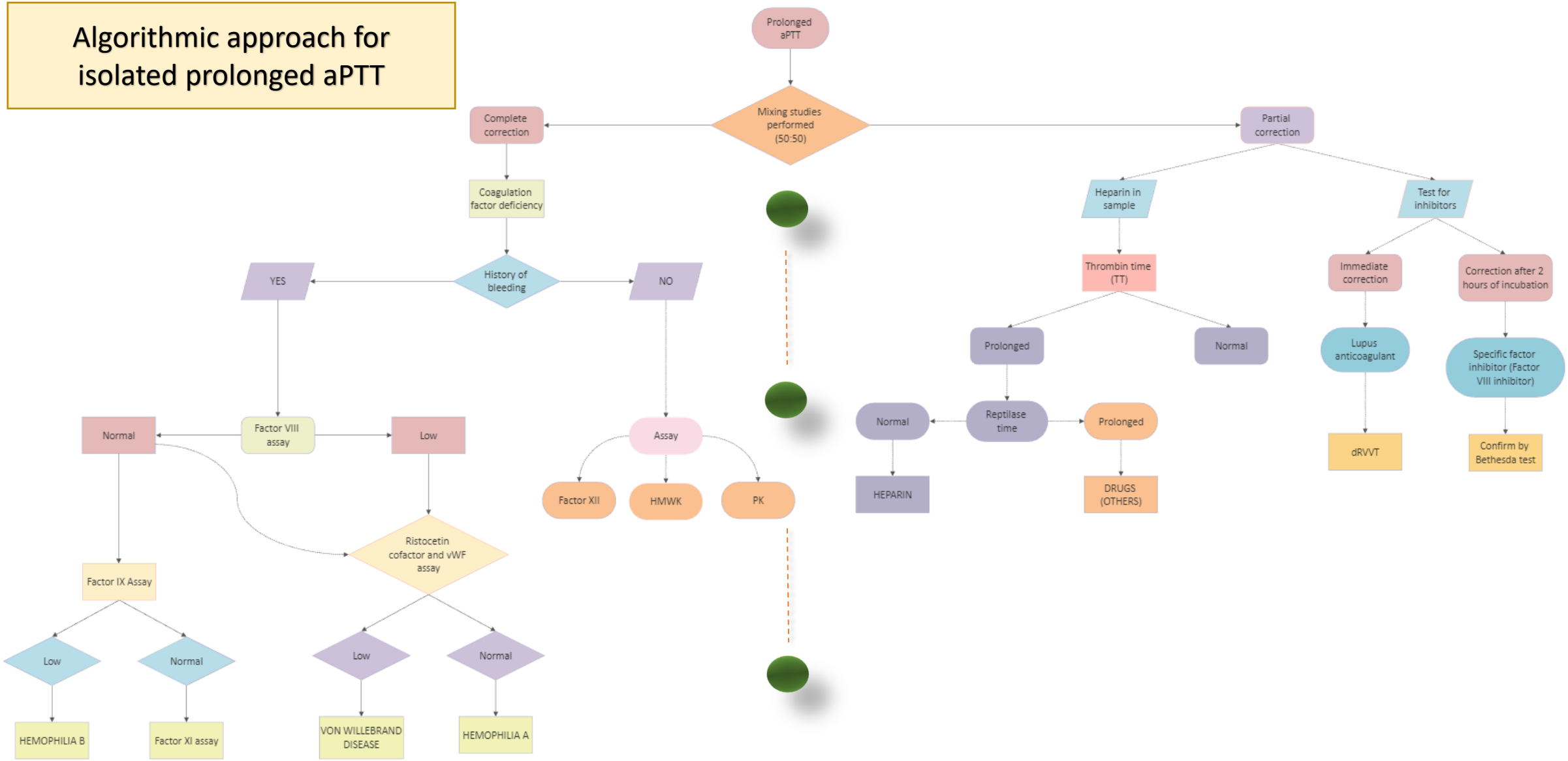
Dr. Swaminathan K, Professor and Head, Pathology, Tirunelveli Medical College

AN ALGORITHMIC APPROACH TO COAGULATION DISORDERS

Dr. D.Febe Renjitha Suman
Prof of Pathology
Sri Ramachandra Institute of Higher Education and Research.



Algorithmic approach for isolated prolonged aPTT



Path Stories

INTERVIEW WITH A TUMOUR CELL

1 This cancer cell must be dumb to prefer glycolysis over oxidative phosphorylation. Let me know, what it thinks!

Interviewer

2 Hello Mr. Tumour cell, When you are so rapidly growing and need more ATP for energy, why do you prefer the inefficient glycolytic pathway, that yields only 2 molecules of ATP per molecule of glucose?

3 Its because, I need metabolic intermediates (carbon moieties)

Tumour cell

4 What do you do with them?

5 I need them for the synthesis of cellular components required for my rapid growth

6 Really!

7 How do you do this?

8 With mutations in proto-oncogenes and tumour suppressor genes, overexpression of **MYC** and signalling through **receptor tyrosine kinases/PI3K/AKT**

9 Do you face any problem due to this?

10 Yes. This "Glucose hunger" behaviour of mine is used to visualize us (tumour masses) by PET scan and we get caught!

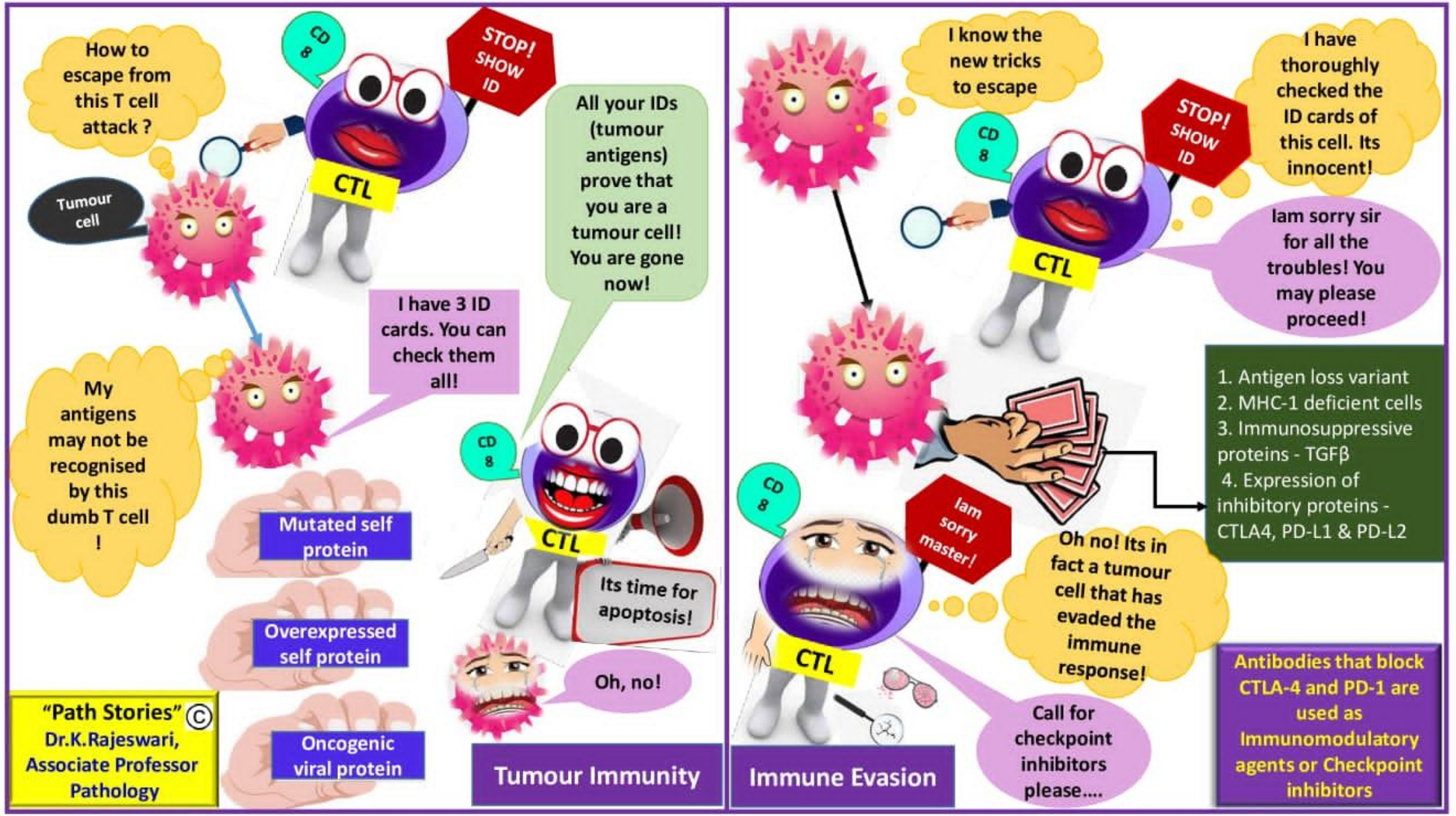
11 Interesting!

"Path Stories"© Dr.K.Rajeswari, Associate Professor Pathology

Warburg effect

Warburg metabolism is not cancer-specific, it is a general property of growing cells that is exploited by cancer cells

Path Stories



Anagrams

1.Clocut - ---------- (hidden)
2.Christamoo----------(tumour like mass)
3.Episome perils ----------(cell within cell)
4.Carri moray ---------- (a diagnostic tool)
5.Cotes inky ----------(signaling proteins)
6.Homage notes ---------- (lymphoid precursor)
7.Toe his city ---------- (cell with many names)
8.Getori ---------- (physiological enlargement)
9.Uro mist varia ---------- (germ cell tumour)
10.Besides fossa ----------(inclusion bodies in thalassemia)
11.sail means hisi ---------- (protozoal infection)
12.lies proptosis ---------- (an infection)
13.Curba alert ----------(pattern)
14.golgi maana par ----------(neuroendocrine tumour)
15.chiv row ----------(Pope of medicine)
16.citrus blouse ----------(white plague)

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Answers for the Anagram

1. Occult
2. Choristoma
3. Emperipolesis
4. Microarray
5. Cytokines
6. Hematogones
7. Histiocyte
8. Goitre
9. Struma ovarii
10. Fessas bodies
11. Leishmaniasis
12. Leptospirosis
13. Trabecular
14. Paraganglioma
15. Virchow
16. Tuberculosis

Best wishes!!

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