

Foreword

It is with great pleasure I write this forward to the Path-finders Journal, the official journal of the Department of Pathology in its first issue. This is a landmark event in our Department. This will ensure all the presentations done in monthly CE/CPD program and in the Journal club are included in Path-finders journal as abstracts. The CE/CPD program is Faculty Board approved program to provide opportunities to learn for those who seek, especially laboratory staff, especially on quality management, accreditation and novel tests. This effort on dissemination of knowledge will be a starting point for many followers. I take this opportunity to appreciate all the academic and non-academic staff members contributing to all these activities and indeed the three demonstrators; Yasara, Vihanga and Dinushi for initiating editorial and designing tasks. Big achievements need a small step to start. Wish long life and long journey to journal ;Path-finders!

Prof. K.A.C. Wickramaratne. Head. Department of Pathology 12/10/2023

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“In the realm of medicine, ethos guides our credibility, pathos connects us emotionally, and logos sharpens our reasoning. Pathology unfolds the narrative of afflictions, where credibility, empathy, and logical analysis converge for healing”

In the intricate discipline of medicine, especially in the area of pathology, the three components of ethos, pathos, and logos serve as the cornerstone of our methodology. Credibility, or ethos, ensures the reliability of our medical knowledge. Pathos, or the emotional connection, ties our comprehension to the individual histories of the patients. In the meantime, the domain of logic, or logos, refined our analytical skills to understand the intricacies of illnesses. This synergy is most evident in pathology, where each component is essential to solving the puzzles surrounding ailments. The combination of empathy, credibility, and sound reasoning becomes a potent force that propels us toward the ultimate aim of healing as we traverse the complex web of medical disorders.

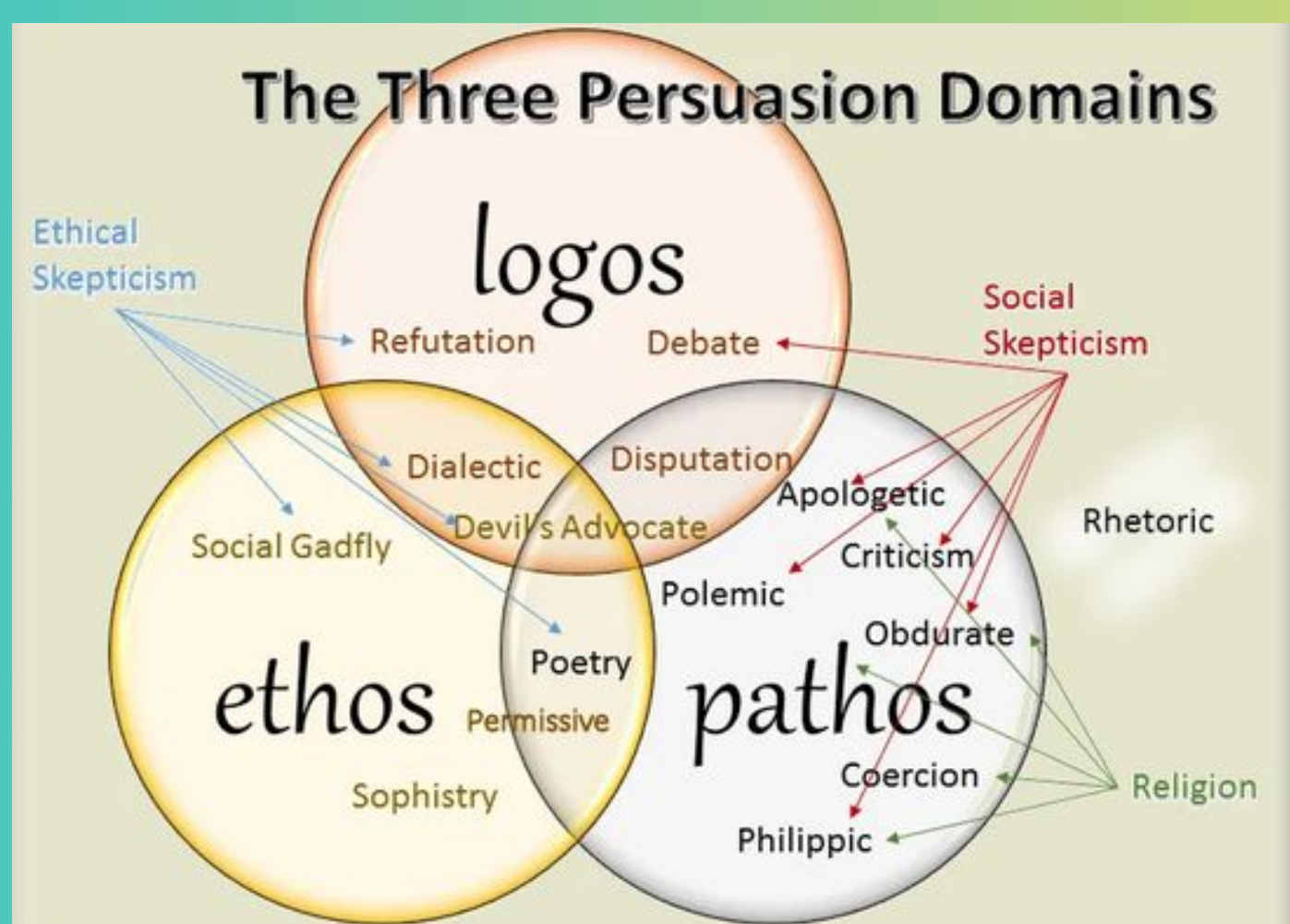


Figure 1. The Three Persuasion Domains: ethos, pathos and logos (The Ethical Skeptic, 2023)

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Novel Diagnostic and Prognostic Tests in Breast Carcinoma; My Experience

-Dr. T. W. Wijesiri-

Breast carcinomas are a heterogeneous group of malignant epithelial tumours that arise in the breast parenchyma. Breast cancer is the second most common cancer in the world and the most frequently occurring cancer among females. Breast cancer care has shown tremendous advancements in recent years in various ways. In my experience, I got exposure to IHC markers and molecular tests about BC diagnosis and prognosis. p120 is a novel immunohistochemical (IHC) marker that is used to differentiate lobular carcinoma from duct carcinoma. In cancer cells with loss of E-cadherin or dysfunctional cadherin /catenin unit, there is redistribution of p120 catenin from the juxtamembranous position to the cytoplasm. p120 shows cytoplasmic staining in lobular carcinoma and membrane staining in duct carcinoma which help to differentiate both. D-DISH is a new test for the assessment of HER2/neu gene overexpression on light microscopy. D-DISH report both the HER2/Ch 17 signal ratio and HER2 copy number. Tumours showing a ratio greater than or equal to 2.0 and/or a mean HER2 gene copy number ≥ 6 are considered to be positive. Cases with dual-probe HER2/CEP17 ratio < 2.0 with an average HER2 copy number < 6.0 signals/cell are considered as HER2 negative. OSNA is a novel molecular test used to detect metastasis in sentinel lymph nodes in the breast. It identifies the CK19 copy numbers by a PCR method and is categorized as positive or negative for metastasis. Prosigna is another novel prognostic test that evaluates around 50 prognostic molecular markers in breast carcinoma and assesses the risk for distant recurrence which helps in patient management. Breast cancer care has seen tremendous advancements in recent years through various innovations to improve early detection, diagnosis, treatment, and prognosis. Implementing those tests in our country will be challenging, but awareness and understanding of the need for those tests is important.

Key Reference:

- [Internet]. [cited 2024 Jan 3]. Available from: <https://www.breastcancer.org/screening-testing/prosigna-assay>

Risk Based Quality Improvement: Part 1

-Prof. K.A.C. Wickramaratne-

Risk is potential for harm, loss, failure, damage, or adverse effect. Risks are everywhere. How we face them, stop or control them will vary based on risk, the environment, situation and context of risk exposure understanding. How does the risk relate to quality in laboratories? The laboratories should ensure safety of patients by issuing reliable reports, within appropriate time to the correct destination. It should be the test requested by clinician, performed in the correct sample collected from correct individual. The report should carry correct information. Quality is fulfillment of set of criteria or maintaining standards. Thus report quality means fulfillment of all mentioned above. If test results are incorrect that can harm the patient. Incorrect diagnosis, delayed diagnosis, inappropriate treatment, inappropriate investigations, and interventions such as inappropriate ICU admissions have been reported. Other risks in laboratories are biohazard, chemical hazard, and physical hazards. Physical hazards are everywhere, even at home or office (fire, falls, electric, and injuries). Therefore, actions are needed to mitigate or control risks in laboratories. Risk based management is not new. The latest ISO15189:2022 standard redirects laboratories to pay full attention on risks, risk management, and risk mitigation etc. To manage risks, need to breakdown every process in to smallest manageable tasks. Then, we should identify potential ways every task can go wrong or fail, the likelihood of occurrence, and its consequences. This is described as Failure mode and effect analysis (FMEA). Immediate actions has to be taken for all the risks which are highly likely to occur and which have serious consequences. The risk analysis can be done based on data in literature, audits, customer complaints or feedback, incidence records, direct observations, employee suggestions etc. to list out risks in key processes.

Key References:

- ISO 15189:2022
- EP 23-A A practical guide for laboratory Quality Control Based on Risk Management
- EQUIP 7 ACHSi risk assessment and control

Planetary Health

-Dr. Sandeepa Jayawardane-

Planetary health, a concept rooted in the interconnectedness of human well-being and natural systems, recognizes the profound relationship between human health, ecosystems, and the environment. This holistic approach extends beyond traditional health perspectives, emphasizing the vital interplay between people and the planet. Understanding the intricate links between environmental degradation and human welfare underscores the importance of preventive and holistic strategies. Key challenges to planetary health encompass climate change, biodiversity loss, pollution, and unsustainable resource use. Addressing these challenges requires collaborative efforts, and acknowledging overlapping goals between planetary health and public health. It involves tracking root causes such as social, economic, and environmental determinants while engaging diverse sectors for effective action. Achieving planetary health involves aligning with Sustainable Development Goals (SDGs), promoting sustainable lifestyle choices, and advocating for policy interventions. Solutions and opportunities lie in renewable energy adoption, conservation and restoration of ecosystems, sustainable agriculture practices, and embracing a circular economy to minimize environmental impact. Global cooperation is imperative, involving international collaboration, research and innovation support, and coordinated policies for environmental protection. Looking to the future, education, awareness, and youth engagement play pivotal roles in ensuring intergenerational equity and a habitable planet for future generations. In conclusion, planetary health is a shared responsibility, urging individuals to play a role in safeguarding the health of our planet and securing a sustainable future for humanity.

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Melioidosis

-Dr. Sandeepa Jayawardane & Dr. P.W.I. Yasara -

Melioidosis is a bacterial infection caused by *Burkholderia pseudomallei*, a gram-negative bacterium found in soil and water in certain regions, including Southeast Asia, Northern Australia, South Asia, and China. The infection can be transmitted through percutaneous inoculation, inhalation, aspiration, or ingestion. Risk factors include exposure to soil and water, monsoon and wet seasons, and comorbidities like diabetes, hazardous alcohol use, chronic kidney disease, and lung diseases. The clinical features of melioidosis vary, with most cases being subclinical. The acute presentation often involves pneumonia, characterized by high fever, cough, respiratory distress, and potential shock. Chronic pneumonia can mimic tuberculosis symptoms. Skin infections, genitourinary issues, septic arthritis, osteomyelitis, and encephalomyelitis are less common manifestations. Diagnosis relies on culturing *B. pseudomallei* from any site, with characteristic gram-negative bacilli seen in purulent samples. Treatment involves an intensive phase with parenteral antibiotics like carbapenem or ceftazidime, often combined with adjunctive therapy for septic shock. The eradication phase includes oral antibiotics such as trimethoprim/sulfamethoxazole and doxycycline for at least three months. Prevention strategies focus on avoiding exposure in endemic areas, especially during the wet season, and staying indoors during severe weather to prevent aerosolization. Cystic fibrosis patients are advised against traveling to endemic regions. Post-exposure prophylaxis with trimethoprim/sulfamethoxazole or amoxicillin-clavulanate, given for 21 days, is recommended for individuals who have been exposed to the bacterium.

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Plastic Microparticles in Food and Beverages: Health Impacts and Assay

- Dr. P.W.I. Yasara -

Plastic microparticles, defined as plastic debris measuring less than 5 mm, pose a growing concern in food and beverages, raising questions about their health impacts and assessment methods. These microparticles fall into two categories: primary, intentionally manufactured in small sizes, and secondary, resulting from the breakdown of larger plastic items. They exhibit the potential to cross epithelial barriers and distribute in various organs, with absorption pathways including paracellular resorption, active transport, and interaction with microfold (M) cells of Peyer's patches. To determine microparticles in food and beverages, a comprehensive approach is essential. Sampling should adhere to established protocols, considering the type of food or beverage and analysis purpose. Filtration, typically using a pore size of 0.45 μm or smaller, and subsequent extraction are crucial for isolating microplastic particles. Various analysis techniques come into play, including visual identification through optical or electron microscopy, spectroscopy such as Fourier-transform infrared spectroscopy (FTIR) or Raman spectroscopy, and quantification methods like image analysis software or specialized equipment like flow cytometry. A study by ÖBmann (2020) on microplastics in mineral water highlighted that many particles and pigment particles were present in cleaned glass bottles, contaminating the filled mineral water. The bottle cleaning process emerged as a potential contamination pathway. The research emphasized the importance of analyzing the smallest microplastics, achieved through innovative methods employing aluminum-coated PC membrane filters and micro-Raman spectroscopy, enabling analysis down to 1 μm . Addressing the urgent need to mitigate microplastic environmental contamination, strategies include improving waste management practices, reducing single-use plastics, promoting recycling, fostering the development of alternative materials, and raising public awareness regarding health and environmental hazards. This multifaceted approach is crucial for safeguarding both human health and the environment from the pervasive threat of plastic microparticles. In conclusion, understanding, detecting, and mitigating the presence of plastic microparticles in food and beverages require a comprehensive and interdisciplinary approach. Ongoing research and the implementation of preventive measures are imperative to safeguard human health and environmental integrity in the face of this emerging global challenge.

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Figure 2. Microplastics and associated contaminants in food and beverages (Methmika *et al.*,2023)