7. Short news

1. Temporo – Mandibular Joint (TMJ) Implant

Recently, four patients successfully received indigenous customized Temporo-Mandibular Joint (TMJ) implants at the Maulana Azad Institute of Dental Sciences (MAIDS), New Delhi,

About Temporo-Mandibular Joint (TMJ) -

The TMJ is the joint connecting the lower jaw (mandible) to the skull, allowing essential movements such as chewing, speaking, and facial expressions. Disorders in this joint can cause severe pain, restricted jaw movement, and difficulty in daily functions, often requiring surgical replacement in advanced cases.

About the TMJ Implant -

The indigenously developed TMJ implant is a custom-designed prosthetic created through advanced biomedical engineering at the ICMR-DHR-MedTech Product Development Acceleration Gateway of India (mPRAGATI), coordinated by MDMS at IIT Delhi. It provides improved jaw mobility, enhanced muscle attachment for better function and aesthetics, and faster post-surgical recovery. The implant is five to ten times cheaper than imported versions, developed under the Make in India initiative, ensuring wider patient access and cost-effective treatment.

2. World Para-Athletics Championships 2025

The World Para-Athletics Championships 2025 was hosted for the first time in New Delhi, India.

About World Para-Athletics Championships 2025

It is the flagship global event for differently-abled athletes, organized under the International Paralympic Committee (IPC) to promote inclusivity and excellence in sports. The 2025 edition - The 12th edition of World Para-Athletics Championships held in New Delhi from 26 Sept, 2025 – 5 Oct, 2025. It witnessed participation from nearly 100 nations, making it one of the largest para-sport events ever hosted by India. It provides a platform for para-athletes to qualify for the upcoming Paralympic Games, Brazil finished top of the medal tally with 44 medals, including 15 gold medals, 20 silver medals, and 9 bronze medals.

India's Performance - India finished at 10th with its best-ever medal tally at the championships, winning a total of 22 medals, including 6 Gold, 9 Silver, and 7 Bronze.

3. UNESCO Director-General

Egypt's Khaled el-Anani has been nominated as the next Director-General of UNESCO, potentially becoming the first Arab to hold the position.

About UNESCO (United Nations Educational, Scientific and Cultural Organization)

UNESCO is a specialized agency of the United Nations. Established in 1945 and headquartered in Paris, France. Dedicated to fostering international collaboration, it promotes peace and security through educational, scientific, and cultural reforms. In addition to choosing and protecting World Heritage sites and traditions,it also works to ensure education for girls, promotes Holocaust awareness and funds scientific research in developing countries, among other activities. It has 194 member states and 12 associate members, with India being a founding member.

UNESCO Administration - The General Conference, comprising all member states, sets policies and approves the budget. The Executive Board oversees program implementation and administration. The Secretariat, led by the Director-General, executes day-to-day operations, manages programs, and coordinates activities across its global offices and field missions.

Sources of Funding -

Assessed Contributions - Mandatory payments from member states, providing stable and predictable income.

Voluntary Contributions - Additional funds from member states, international organizations, civil society, and the private sector, crucial for strategic programs and urgent needs.

Other Sources - Income from publications and funds-in-trust donated for specific purposes.

Financial Challenge - UNESCO faces likely budget shortfalls after the US withdrawal, which accounts

for 8% of overall funding.

4. World Cerebral Palsy Day

World Cerebral Palsy Day was observed on 6 October 2025 to raise awareness and advocate for the rights of people living with cerebral palsy globally.

About Cerebral Palsy

Introduction - Cerebral Palsy (CP) is a group of disorders affecting movement, posture, and muscle control due to abnormal brain development or damage to the developing brain. It is the most common motor disability in childhood.

Causes - CP can result from prenatal, perinatal, or early postnatal brain injury. Risk factors include infections, hypoxia, premature birth, and Rh incompatibility.

Prevention - Prevention involves maternal vaccinations, avoiding infections, managing health conditions, and abstaining from alcohol and smoking during pregnancy.

Treatment - Early interventions, therapy, assistive devices, and rehabilitation support help manage symptoms.

Global Burden - Approximately 1.8 crore people live with CP worldwide. In India, the incidence is about 3 per 1,000 live births.

About World Cerebral Palsy Day

Introduction - Established by the Cerebral Palsy Alliance in 2012, the day unites people with CP, families, and organizations to promote equal rights, inclusion, and awareness.

2025 Theme - "Unique and United".

India's Initiative - The Department of Empowerment of Persons with Disabilities (DEPwD) and National Institutes/Composite Regional Centres organized awareness programs, competitions, and cultural events to celebrate children with CP.

5. Pasni Port, Pakistan

Pakistan has reportedly offered the Pasni port on the Arabian Sea to the USA as a terminal for shipping critical minerals, aiming to strengthen bilateral economic engagement.

About Port Pasni

Introduction - The Port of Pasni is a small deep-water harbour in Balochistan's Gwadar district, equipped with a fish harbour, cargo jetty, and a Pakistan Maritime Security Agency (PMSA) base.

Location - The port is located about 113 km from China-backed Gwadar Port, 161 km from the Pakistan–Iran border, and 300 km from Iran's Chabahar Port, which is being developed by India.

Strategic Significance - Pasni could be linked to mineral-rich areas like Reko Diq through a new railway, facilitating exports to the US. Its location provides geopolitical and economic leverage in South Asia.

6. Global Research on Heatwave Deaths Caused by Climate Change

A global research study led by Australia has revealed that over half of all deaths during the 2023 heatwaves were directly linked to human-induced climate change.

Key Findings of the Study

Scale of Impact - Out of 1,78,486 heatwave-related deaths, approximately 54% (over 1 lakh deaths) were attributed to anthropogenic climate change.

Scope of Analysis - The study covered 2,000 locations across 67 countries, representing the most extensive global assessment of heat-related mortality to date.

Hottest Year on Record - The year 2023 registered a global average temperature 1.45°C above pre-industrial levels, making it the warmest year ever recorded.

Southern Europe - Recorded the highest mortality rate, followed by Eastern and Western Europe, reflecting extreme summer heat events.

Subtropical & Temperate Regions - Most deaths occurred in these zones of the Northern Hemisphere, where rising temperatures intensified cardiovascular and respiratory illnesses.

Future Threats - Australia's Climate Risk Report projects that if global warming exceeds 3°C by 2050, millions of homes could face rising sea levels, deadly heat, and coastal inundation.

Heatwave

A heatwave is a period of abnormally high temperatures, often accompanied by high humidity, lasting for several days or weeks. It occurs when high-pressure systems trap warm air, preventing heat from dissipating and leading to prolonged hot conditions. In India, the India Meteorological Department (IMD) defines a heatwave based on temperature thresholds and regional norms.

IMD Criteria for Heatwave in India

Plains - Maximum temperature ≥ 40°C.
Hilly Regions - Maximum temperature ≥ 30°C.
Based on Departure from Normal Temperature

1. Heatwave - if it is 4.5°C to 6.4°C above normal
2. Severe Heatwave - if it is ≥6.5°C above normal.

Based on Absolute Temperature

1. If maximum temperature ≥ 45°C → Heatwave.
2. If ≥ 47°C → Severe heatwave.

Causes of Heatwaves

1. Atmospheric high-pressure systems that trap heat near the surface.
2. Climate change, increasing frequency and intensity of extreme temperature events.
3. Urban Heat Island effect, where cities trap more heat due to concrete, low vegetation, and pollution.
4. Deforestation and land degradation, reducing natural cooling

7. Indian Radio Software Architecture (IRSA) Standard 1.0

The Defence Research and Development Organisation (DRDO) has launched Indian Radio Software Architecture (IRSA) Standard 1.0, a landmark initiative aimed at achieving self-reliance, standardisation, and interoperability in India's military communication systems.

About IRSA 1.0

Definition - IRSA 1.0 is a comprehensive software architecture standard for Software Defined Radios (SDRs), which are critical for modern, secure, and adaptive military communications.
Developed by - DRDO in Collaboration with the Integrated Defence Staff (IDS) and the Tri-Services.
Core Features -

1. Defines standardised interfaces, APIs, and execution environments for SDR platforms.
2. Enables waveform portability, interoperability, certification, and conformance across services.
3. Ensures compatibility between communication systems used by the Army, Navy, and Air Force.

Built to evolve with emerging operational needs, supporting next-generation secure communication technologies and indigenous SDR innovation.

Software Defined Radios (SDRs) -

It is a radio communication system where most of the functions that were traditionally implemented using hardware (like filters, amplifiers, modulators, etc.) are instead performed by software on a computer or embedded system. In a conventional radio, hardware circuits handle modulation, demodulation, and frequency filtering. In an SDR, an analog-to-digital converter (ADC) converts received radio signals into digital form. Then, software algorithms perform signal processing tasks such as -

1. Frequency tuning
2. Modulation/demodulation
3. Encryption/decryption
4. Error correction

Thus, by changing the software, an SDR can adapt to different frequencies and protocols without changing its hardware. **Applications -** Defence & Security, Telecommunications, Disaster Management and Space Research.

Development Journey of IRSA

Initiation - The IRSA project was conceptualised in 2021, following recognition of the critical role of SDRs in modern warfare.

Technical Development - In 2022, a core technical team led by DRDO began development with active participation from the IDS and Armed Services.

Approval - Version 1.0 was approved by the High-Level Advisory Committee (HLAC) in 2025 after rigorous validation.