Telehealth Newsletter

Official Newsletter of Telemedicine Society of India

What is New?

As summer unfolds, the sweltering heat nudges folks indoors or towards cooler terrains like the hills, a trend accentuated by the closure of schools and colleges. Please ensure to take care of yourself as temperatures soar, poised to break new records.

This newsletter reflects a more inclusive portrayal of our community, thanks in large part to the efforts of the TSI central office, particularly Neeraj and Dr. Umasankar. Beginning with this edition, we're organizing our newsletter content into four main sections: Education, TSI activities nationwide, Announcements, and News. Your contributions are invaluable in documenting our collective endeavors, preserving them for posterity.

Stay updated on the latest developments within TSI as significant initiatives take shape. Let's stay connected and informed about all that's unfolding within our community.

Happy Holidays!

Thank You
Dr. Sunil Shroff
Chief Editor
Vice President, TSI

::Education Section::

SNOMED CT - A Medical Code for Clinical Practice

Prof. Dr. SB Bhattacharyya
MBBS, MBA, FCGP (Hony)

SNOMED CT stands for **Systematized Medical Nomenclature for Medicine–Clinical Terminology** and is a clinical terminology system that provides a standardized and scientifically validated way of representing clinical information captured by clinicians.

SNOMED CT is a special type of medical coding system called terminology system **where the meaning of a term is coded instead of the term itself**. It is a controlled medical vocabulary containing standard terms and that codes the concept definition (meaning) of a term. This definition is a formal logical representation of the information that is always necessarily true about its meaning.

This information representing the meaning is modelled as a set of interrelated triples, which encodes it in a structured format thereby making it machine-interpretable. Being always necessarily true under all circumstances, the meaning is interpreted exactly the same way everywhere each and every time.

The information model is made up of the three entities: **subject, predicate and object (hence called semantic triples)** that are represent the concept's relationships.

The SNOMED concept model mandates that at least one of the triples must have the concept as the subject, the relationship "is a" as the predicate, and another concept as the object which represents a broader definition.

This makes the subject concept a finer representation or subtype of the object concept. There can be any number of additional triples that are either subtype relationships or attribute relationships, which have different relationship types as predicates.

Example: Appendicitis is coded by its concept definition. Note the three distinct components of each line - together they form the "triple".

1. "Appendicitis" "Is a" "Disorder of appendix"
2. "Appendicitis" "Is a" "Inflammation of large intestine"
3. "Appendicitis" "Finding site" "Appendix"
4. "Appendicitis" "Associated morphology" "Inflammatory morphology"

This makes the concept of "Appendicitis" to be a finer version of the "Disorder of appendix" concept (there can be other subtype finer concepts of this like "Appendicular abscess", "Intussusception of appendix", "Appendicular neoplasm", etc.) and of "Inflammation of large intestine" concept (whose other subtype finer concepts would be "Colitis", "Crohn's disease", "Proctitis", etc.). Incidentally, "Appendicitis" concept has several subtype finer concepts such as "Acute appendicitis", "Chronic appendicitis", "Atypical appendicitis", and more.

As is clearly evident from above, all of the four assertions are always necessarily true of the meaning of "Appendicitis" irrespective of any other consideration.

Combining the above, as per SNOMED CT Expression Constraint Language (ECL), the unique language used to express the concept definition is as follows:

=== 18526009 |Disorder of appendix (disorder)| + 302168000 |Inflammation of large intestine (disorder)| : { 363698007 |Finding site (attribute)| = 66754008 |Appendix structure (body structure)|, 116676008 |Associated morphology (attribute)| = 409774005 |Inflammatory morphology (morphologic abnormality)| }

From the above it is evident that the individual components of the triples are in codes making the entire definition machine-interpretable.

Every concept definition is assigned a unique machine-processable identifier.

Example: Code for Appendicitis is 74400008.

Every concept is assigned a unique human-readable official name that explains the concept in a non-vague manner, which is called Fully Specified Name, or FSN, that has the concept's domain enclosed in parentheses as a suffix to help disambiguate it.

Example: FSN for Appendicitis is Appendicitis (disorder).

All terms synonymous with a concept's definition is assigned the same concept code.

Example: Inflamación aguda del apéndice [Spanish], Appendicite [French], blindedarmontsteking [Dutch], Appendicit [Swedish] - all have the same code 74400008.

SNOMED CT also permits the coding of terms without matching concept definitions in a standardised manner,

post-facto, for machine-processability and machine-interpretability of user specific or local terms.

The concepts can be constrained, extended, or mapped to other code systems as required. All of the resultant codes will be standards-compliant, making the code system very flexible and customisable.

Example:
1. Myalgia relieved by analgesic === 706955002 |Pain relieved by analgesic (finding)| : 363698007 |Finding site (attribute)| = 127954009 |Skeletal muscle structure (body structure)|
2. operable tumour === 128303001 |Surgical removal (procedure)| : 363700003 |Direct morphology| = 108369006 |Neoplasm (morphologic abnormality)|
3. GC fair === 162669003 |Patient's condition satisfactory (finding)|

The relationships of the concept definition can be used for in-depth query and its machine-interpretability makes all SNOMED coded information Artificial Intelligence (AI) and Machine Learning (ML) ready - imparts "intelligence".

Example: Appendicitis has many "is a subtypes" of its own and it itself "is a subtype" of others. These relationships as well as its attribute relationships (assertions # 3 & 4 in the above example) can be used to do semantic search or to generate custom cohorts on-demand or trigger automated follow on action using preset rules like "for all concepts having inflammatory morphology as associated morphology prescribe antibiotics". Since the code is sufficient for this, on user entry, the required action can be performed by the machine without any further action by the user.

In conclusion, SNOMED CT can be said to be a dictionary of healthcare for machines to "understand" human understandable terms.

Decoding AI: Understanding the Language of the Future - Part 2

Dr. Sunil Shroff
Vice President, Telemedicine Society of India | Consultant Urologist & Transplant Surgeon

In the last newsletter we had covered 10 terms related to AI. These were - Artificial Intelligence (AI), Machine Learning (ML), Deep Learning, Neural Network, Natural Language Processing (NLP), Algorithm, Data Mining, Supervised Learning, Unsupervised Learning and Token.

Here are ten more terms that you should know if you have an interest in this rapidly growing area.

11. Reinforcement Learning: This is another type of machine learning where an AI agent learns to make decisions by interacting with an environment. It receives feedback in the form of rewards or penalties, allowing it to learn the best course of action through trial and error.

12. Computer Vision: Computer vision enables machines to interpret and understand the visual world, much like humans do. It involves tasks such as image recognition, object detection, and image classification.

13. Convolutional Neural Network (CNN): A type of neural network specifically designed for processing structured grid-like data, such as images. CNNs are widely used in computer vision tasks due to their ability to automatically learn and extract features from images.

14. Recurrent Neural Network (RNN): Unlike feedforward neural networks, RNNs have connections that form cycles, allowing them to exhibit temporal dynamic behavior. They are commonly used in tasks involving sequential data, such as natural language processing and time series prediction.

15. Transfer Learning: Transfer learning involves leveraging knowledge gained from solving one problem and applying it to a different, but related, problem. It allows AI models to be trained more efficiently, especially when labeled data is scarce for the target task.

16. Generative Adversarial Network (GAN): GANs consist of two neural networks, a generator and a discriminator, which are trained together in a competitive manner. The generator generates synthetic data samples, while the discriminator tries to distinguish between real and fake samples. GANs are often used for generating realistic images, videos, and other types of data.

17. Edge Computing: Edge computing refers to the practice of processing data near the source of data generation, rather than relying solely on centralized cloud servers. It's particularly important for AI applications that require low latency and real-time processing, such as autonomous vehicles and IoT devices.

18. Explainable AI (XAI): Explainable AI focuses on developing AI systems that can explain their decisions and actions in a human-understandable manner. This is crucial for ensuring transparency, accountability, and trustworthiness in AI applications, especially in high-stakes domains like healthcare and finance.

19. Unsupervised Learning: Unlike supervised learning, unsupervised learning involves training a machine using information that is neither classified nor labeled. The machine tries to identify patterns and relationships in the data on its own, like learning without a teacher to guide you.

20. Token: In the context of AI, especially in natural language processing, a token is typically a word or piece of text that the machine uses to understand and generate language. It's like breaking down a sentence into individual pieces to better understand its meaning.

These terms cover a range of concepts and technologies within the field of artificial intelligence, offering a deeper understanding of its diverse applications and methodologies.

Test your Knowledge

A relatively basic quiz to get you started and firm up your concepts. (Source: www.medindia.net)

1. Question: Which technology played a significant role in the early development of telemedicine?
a) Internet
b) Radio
c) Television
d) Satellite

2. Question: Telemedicine has NOT evolved significantly with the integration of AI technologies.
True   False

3. Question: What is the primary goal of using AI in telemedicine?
a) Optimization
b) Diagnostics
c) Teleportation
d) Treatment

4. Question: Deep learning is commonly used in telemedicine for natural language processing.
True   False

5. Question: What is considered one of the earliest instances of telemedicine?
a) Television
b) Telephone
c) Telegraph
d) Teletype

6. Question: The primary goal of using AI in telemedicine is to enhance healthcare delivery.
True   False

7. Question: Which AI technique is commonly used in telemedicine for image analysis and interpretation?
a) Reinforcement learning
b) Supervised learning

c) Deep learning
d) Unsupervised learning

8. Question: Telemedicine primarily relies on face-to-face consultations.
True   False

9. Question: What is the main purpose of telemedicine?
a) To replace traditional medicine
b) To provide remote healthcare services
c) To reduce the need for healthcare professionals
d) To limit patient access to healthcare

10. Question: AI in telemedicine has led to advancements in real-time data analysis.
True   False

(Find Answers after News Section)

::TSI Activities from Around the Country::

Digital Health: Next Frontier of Modern Healthcare

Prof. B.N. Mohanty
Professor Emeritus Endocrine Surgery, Department of Surgery IMS & Sum Hospital, SOA Deemed to be University Bhubaneswar | Chief Coordinator, Oditelemedicon 2024 | Past President, TSI-Odisha Chapter and Past President-TSI

The 12th annual conference of The Telemedicine Society of India (TSI), Odisha Chapter (Oditelemedicon 2024) was organized by TSI, Odisha Chapter in association with IMS & Sum Hospital, Siksha 'O' Anusandhan Deemed to be University, Bhubaneswar as a hybrid event on 13th April 2024. The venue for the conference was Annex Auditorium, IMS & SUM Hospital, Bhubaneswar. The theme of the conference was **"Digital Health: the next frontier of modern healthcare"**. A total number of 101 participants from various districts of Odisha physically attended the conference.19 TSI members attended the conference over virtual platform. The coordinator of the conference was Dr. Prakash Kumar Sahoo from IMS & Sum Hospital, Bhubaneswar.

The conference was inaugurated by Dr. R Kim, President of Telemedicine Society of India. Dr. Pradipta Kumar Nanda, Vice-Chancellor of Siksha 'O' Anusandhan Deemed to be University, Bhubaneswar attended the inaugural function as guest of honor. Dr. Ramnath Mishra, president of TSI, Odisha Chapter presided over the function. Annual Report of the chapter was presented by Secretary Dr. Sabyasachi Pattanayak.

The 1st session was on **'Technology Enabled Health Care- Evolution & Current Practice'**. The speakers in this session were Dr. K Ganapathy, past-president TSI from Chennai, Dr. Samir Ranjan Nayak, Professor of Surgery & I/C smart skill lab. from Rajahmundry and Dr. R Kim, president of TSI from Madurai.

The 2nd session was on **'Health care delivery takes a new shape with technology integration'**. The speakers in this session were Dr. Sanjay Sood, project director eSanjeevani from CDAC Mohali, Dr. Sanjay Sharma, podiatric surgeon & wound care specialist from Bangalore and Dr. Niranjan Mishra, Director of Public Health, Govt. of Odisha from Bhubaneswar.

The thematic symposium was held on the theme **"Digital Health: the next frontier of modern healthcare"** at 2.00pm convened by Dr. S K Mishra, past-president of TSI from Lucknow. The speakers were Dr. S K Mishra, Mr. B K Jain, senior consultant, Population Foundation of India from Lucknow, Dr. Anjali Mishra, Sub Dean, College of Medical Technology & College of Nursing, SGPGIMS Lucknow and Dr. D K Yadav, Assistant Professor, National Institute Health & FW, New Delhi.

The chair persons for different sessions were Dr. I B Kar, past-president, TSI Odisha Chapter from Cuttack; Dr. S N Senapati, past-president, TSI Odisha Chapter from Cuttack; Dr. Srikanta Patnaik past-president, TSI Odisha Chapter from Bhubaneswar, Dr. Sibananda Mohanty past-president, TSI Odisha Chapter from Angul; Dr. R N Sahu immediate past-president, TSI Odisha Chapter from Bhubaneswar.

Faculty members and residents from IMS & Sum Hospital, Medical professionals from other hospitals and medical colleges, TSI members, health administrators working under Govt. of Odisha, Community Health Officers, Nursing Officers from IMS & Sum Hospital, and telemedicine technical personnel attended the conference in-person. Members of TSI including past-presidents, current executive committee members and life members participated in the event over virtual platform from remote locations.

Glimpses of the Oditelemedicon 2024

Dean & Medical Superintendent of IMS & Sum Hospital are being felicitated by TSI-President along with the TSI Odisha Chapter Past Presidents

Inaugural Function

Organising Committee of Oditelemedicon 2024

Telemedicine & Health Care Research

Dr. V. Thulasi Bai
Associate Professor & Head of Electronics and Communication Engineering Department, KCG College of Technology, Chennai | EC Member, TSI-Tamil Nadu Chapter

The 3rd Seminar Series on Telemedicine and Health Care Research was organised by KCG College of Technology in association with Telemedicine society of India-TN Chapter (TSI-TN) on 5th April 2024 at PTR Palanivelrajan Seminar Hall, KCG College of Technology. Dr.Thulasi Bai, Professor, Department of ECE coordinated the overall program.

The workshop was inaugurated through traditional lighting of Kuthuvillakku by the dignitaries of TSI-TN and KCG College of Technology. Dr. Kavitha Balamurugan, Head, ECE department welcomed the gathering. Dr.Ikramullah,

President-TNTSI, MD-Ikram Hospital, Vaniyambadi, President – TSI, TN Chapter gave the presidential address. In his speech, he explained the importance and insights of telemedicine and healthcare.

Dr. T. Senthil, Vice President-TNTSI, Director & CEO, Welcare Health Systems briefed about the telemedicine and its application in Ophthalmology. Mr Satheesh Kumar, Joint Secretary -TSI and Technical Head-SRIHER explain the activities of the TSI-TN and telemedicine in SRM hospital.

After the inauguration the following speakers delivered their speech to assure the participants the best experience about the Telemedicine.

	SESSION – I	10.00 – 10.40 am	Chairperson / Moderator
10.00 AM	AI in Tele-Ophthalmology	Dr R.Kim President -TSI Senior Medical Consultant Director Information Technology & System Aravind Eye Hospital, Madurai.	Dr. G. Kulanthaivel, EC Member- TNTSI Professor & Head, Department of ECE, NITTTR, Chennai
	SESSION – II	10.55-11.45 AM	Chairperson / Moderator
10.55 AM	Telemedicine in Plastic Surgery	Prof.Dr Ravi Kumar Chittoria Professor of Plastic Surgery, Head of IT Wing & Telemedicine JIPMER, Puducherry	Dr. Sheila John Joint Secretary-TNTSI Head – Teleophthalmology Sankara Nethralaya
	SESSION – III	11.45 AM- 12.35 PM	Chairperson / Moderator
11.45 AM	Live Demo Telemedicine Application	Mr Napolean P Chanthachalam& Team EC Member-TNTSI Managing Director, Chandvel Technologies, Chennai	Dr. T. Senthil Vice President- TNTSI Director & CEO, Welcare Health Systems

The Seminar series was attended by around 100 participants (Students and faculty) which Faculty of Electronics and Communication Engineering, Students of ECE, and AI&DS department. The seminar got very good feedback from the students. The workshop came to an end by 1.00 PM.

The organising team thank Management of KCG college of Technology and Principal for hosting the Seminar and TSI-TN for arranging the eminent speakers for the sessions.

Glimpses of the Workshop

Lighting of Kuthuvillakku

Dr. T. Senthil, Vice President- TNTSI ,Director & CEO Welcare Health Systems delivering inspiring speech

Mr. D. Satheesh Kumar,Joint Secretary -TSI and Technical Head-SRIHER (DU) during his session

The Group Photo

The organizing team and TNTSI Delegates

Telemedicine in AYUSH: Opportunities and Challenges

Dr. Surya Bali
Professor, Department of Community and Family Medicine, AIIMS Bhopal & Chairman of Telemedicine Centre, AIIMS Bhopal | Past Organising Secretary- Telemedicon 2014, AIIMS Bhopal | President, TSI- Madhya Pradesh State Chapter

**Date**: 23rd March 2024
Organizer: TSI- Madhya Pradesh State Chapter
Speaker: Dr. Danish Javed, Senior Medical Officer, AIIMS Bhopal

The event was inaugurated with floral welcome to Dr. Mamta Verma, President Elect, Mrs. Lily Poddar, Vice President, Dr. Sagar Khadanga, Hony. Secretary and all other office bearers of TSI Madhya Pradesh chapter. The event was conducted with both online and offline mode with presence from members from the TSI Head Quarter and the Madhya Pradesh state chapter.

Opening remarks from TSI Head Quarter was given by Dr. Murthy Remilla. He briefed the importance of TSI in current health care practice and particularly among AYUSH practitioners. Dr. Danish Javed, Senior Medical Officer, AIIMS Bhopal was the invited faculty for the day. He presented on the subject of **"Telemedicine in AYUSH: Opportunities and Challenges"**. He described various case scenarios from his real-life experiences, particularly from COVID pandemic. After his presentation the house was open for discussion. Dr. Nishant Nambisan another AYUSH practitioner and past office bearer of TSI MP, shared his experiences on the challenges of the legalities.

All other participants actively participated in the discussion. Mrs. Ranjana Verma appraised the audience for a possible event on **"Tele Nursing care"** which is the need of the hour. All other members consented for the proposed event and requested Dr. Mamta Verma for the lead. Treasurer, Dr. Sanjeev Kumar, opined regarding a possible membership drive for MP State chapter. The closing remark was addressed by Mr. D. Satheesh Kumar. Mr. Sathessh addressed on the apprehensions on practice of telemedicine in India and abroad. The event was closed with thanks to chair, Dr. Mamta Verma.

Glimpses of the Event
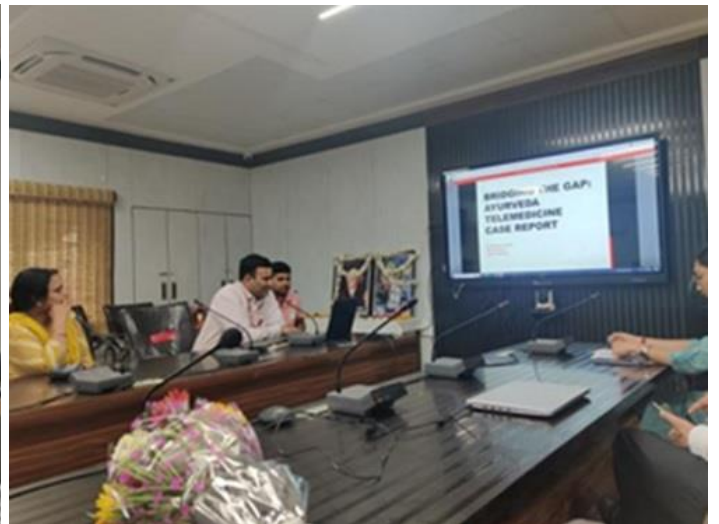
Preventive Radiology and Liver Elastography

Dr. Ankur Mittal
Associate Professor and Head, Department of Urology, All India Institute of Medical Sciences, Rishikesh, Uttarakhand | Secretary, TSI-Uttarakhand Chapter

The Telemedicine Society of India (TSI), UK Chapter in association with Department of Radiology, AIIMS Rishikesh, successfully organized a hands-on training workshop on April

19th, 2024 on Liver Elastography, bringing together medical professionals, researchers, and industry experts. The conference aimed to raise awareness about Preventive Radiology and Liver elastography, a non-invasive technique for assessing liver fibrosis. The conference highlighted the growing role of telemedicine in liver disease management. Experts discussed the use of elastography techniques like FibroScan and vibration controlled transient elastography (VCTE) in remote consultations. These technologies allow for accurate liver stiffness measurement, a crucial factor in diagnosing and staging liver fibrosis.

The event also marked the inauguration of the Uttarakhand State Chapter of Indian Society of Vascular and Interventional Radiology. This will bring interventional radiologists together to provide continuous medical education (CMEs) and provide many such hands-on workshops for better learning of upcoming radiologists.

The conference explored the integration of liver elastography into telemedicine platforms. This would allow for wider access to the technology, particularly in remote areas with limited specialist availability. Telemedicine consultations with specialists could be complemented by liver elastography performed by local healthcare providers, improving overall liver disease management in India.

Presentations emphasized the importance of early detection of liver fibrosis, a condition that can progress to cirrhosis, a life-threatening complication. Liver elastography offers a painless and safe alternative to traditional liver biopsies, making it a valuable tool for primary care physicians and gastroenterologists. Experts addressed the use of liver elastography in diagnosing a spectrum of liver diseases, including chronic hepatitis B and C, non-alcoholic fatty liver disease (NAFLD), and cirrhosis.

The conference also featured interactive sessions where participants engaged in discussions and shared their experiences with liver elastography. These sessions fostered collaboration and knowledge exchange among healthcare professionals.

Overall, the Telemedicine Society of India's collaboration with Department of Radiology, in organising this liver elastography conference served as a valuable platform for disseminating knowledge and promoting the adoption of this non-invasive technology for improved liver disease diagnosis and management.

Glimpses of the Event

Webinar on Ayushman Bharat Digital Mission (ABDM) on 30 April 2024 from 3:00 PM to 4:30 PM

Dr. Umashankar S
Honorary Secretary, Telemedicine Society India (TSI), HQ, Lucknow, Uttar Pradesh

In our constant endeavor to keep our members informed about the various initiatives in the healthcare ecosystem, we are collaborating with the National Health Authority (NHA), MoHFW, to conduct an exclusive webinar on **Ayushman Bharat Digital Mission (ABDM)** on **30 April 2024** from **3:00 PM** to **4:30 PM**.

The vision of ABDM is to create a digital health ecosystem for the nation that can support universal health coverage in an efficient, accessible, and safe manner. The mission is expected to improve the effectiveness and transparency of health services in India.

The agenda of the webinar is as under:

1. Introduction to ABDM and its key components: 15 minutes
2. Advantages of ABDM for key stakeholders: 10 minutes
3. Relevance of ABDM for telemedicine: 10 minutes
4. Demonstration of National Healthcare Providers Registry (NHPR): 10 minutes
5. Q&A: 15 minutes

A brief document covering key aspects of ABDM is attached for your reference. Requesting all the members to register for this webinar by filling this short **Google form**.

Telemedicine - News from India & Abroad

AI Helps Predict Bedsores Risk In Hospitalized Patients
A new research utilized machine-learning or artificial intelligence (AI) methods to create an advanced model..... **Read More**

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Answers to Test your Knowledge

1. b) Radio   2. False   3. b) Diagnostics   4. False   5. c) Telegraph

6. True   7. c) Deep learning   8. False   9. b) To provide remote healthcare services   10. True

TN - TSI invites all the TSI Chapters and Members to submit information on their upcoming Webinar or Events (50 words), News related to Telemedicine (200 words) or short articles (500 words) for the monthly e-newsletter.

Guidelines for submission to TN TSI Newsletter-

1. Report can be from 500 to 600 words

2. Report should be relevant to Telemedicine or Medical Informatics

3. No promotion of self or any product

4. Avoid plagiarism

5. All references should be included

6. Provide any attributions

7. Visuals are welcome including video links

8. Send full authors name, degrees, and affiliations along with a passport sized photograph of good resolution. If multiple authors, only main author photo to be sent.

Submission may be sent to - tsigrouptn@gmail.com
Editors reserve the rights for accepting and publishing any submitted material.

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