

RECENT TRENDS



Course Code: XECO2

**Prepared by
Mr.S.Arunmurugan, AP/ECE**

Transcutaneous Electrical Nerve Stimulation (TENS)

Recent Trends in TENS

Recent Trends in Biofeedback

Recent Trends in Diagnostic and Point-of-Care Platforms

Transcutaneous Electrical Nerve Stimulation (TENS)

TENS is a non-invasive therapy that uses low-voltage electrical currents to provide pain relief.

TENS unit is a small device, often battery-operated, which can sometimes even fit into a pocket.

In a major cancer center for the treatment of severe cancer-related pain and associated disability.

Image for TENS



Recent Trends in TENS

Wearable TENS Devices:

- TENS devices that **can be discreetly worn on the body**, providing pain relief and muscle stimulation
- These devices provide targeted pain relief and can be controlled via smartphone apps.

Wireless Connectivity:

- **To control and monitor their pain relief sessions via smartphone apps.**
- This enables more precise customization and tracking of treatment.

Recent Trends in TENS

Advanced Pain Management Algorithms:

- Stimulation patterns based on real-time feedback from the user

Integration with AI:

- To incorporate artificial intelligence (AI) to analyze user data and provide customized pain relief regimens, improving treatment outcomes.

Combination Therapies:

- In combination with other therapies, such as physical therapy and acupuncture, to enhance pain management and rehabilitation outcomes.

Recent Trends in Biofeedback

Wearable Biofeedback Devices:

Real-time monitoring and feedback on physiological parameters like heart rate, skin conductivity and muscle tension.

Mobile Apps for Biofeedback:

To track their progress, set goals and receive personalized recommendations for stress reduction and relaxation techniques.

Biofeedback in Healthcare:

To assist in the treatment of various conditions, including chronic pain, anxiety disorders, and post-traumatic stress disorder (PTSD).

Recent Trends in Biofeedback

Biofeedback in Mental Health:

Helping individuals learn self-regulation techniques for conditions like anxiety, depression and attention disorders.

Virtual Reality Biofeedback:

To control physiological responses and manage conditions like anxiety and pain.

Neuro feedback for Mental Health:

To regulate brain activity for improved emotional and cognitive functioning.

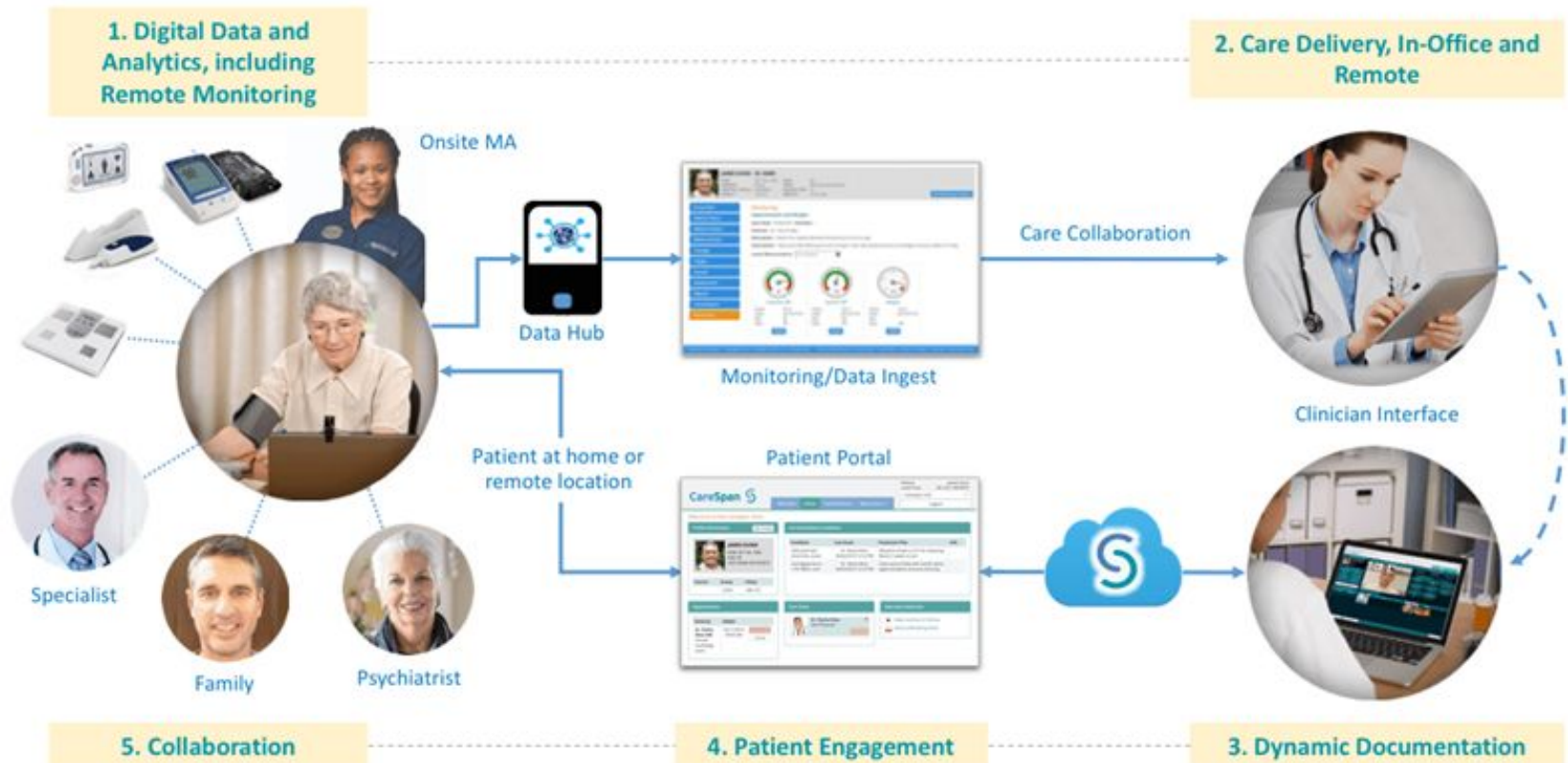
Personalized Health Apps:

Recent Trends in Diagnostic and Point-of-Care Platforms

In the healthcare technologies TENS, biofeedback and diagnostic platforms, with a focus on personalization, accessibility and connectivity to improve patient outcomes and well-being.







Recent Trends in Diagnostic and Point-of-Care Platforms

Point-of-Care Testing (POCT):

- To conduct rapid and accurate diagnostic tests at or near the patient's location, speeding up treatment decisions.

Lab-on-a-Chip Technologies:

- Enabling rapid analysis of biomarkers, viruses and other biological substances with high sensitivity and specificity.

Remote Monitoring and Telehealth Integration:

- Diagnostic and monitoring tools into telemedicine platforms allows patients to receive real-time healthcare assessments and consultations from the comfort of their homes.

Recent Trends in Diagnostic and Point-of-Care Platforms

Artificial Intelligence (AI) and Machine Learning:

- To analyze lab results, medical images, such as X-rays and MRI scans for faster and more accurate disease detection.
- Machine learning models are trained on vast datasets to recognize patterns and trends in medical data.

Personalized Medicine:

- To optimize therapeutic outcomes and reduce adverse effects.

Recent Trends in Diagnostic and Point-of-Care Platforms

Biometric Authentication for Health Records:

(fingerprint and facial recognition)

- To ensure secure access to electronic health records, maintaining patient privacy.

Portable Ultrasound Devices:

- To perform point-of-care ultrasound exams outside traditional clinical settings.

Home Testing Kits:

Diabetes, Blood pressure, Body temperature etc

Biofeedback:

<https://www.verywellmind.com/what-is-biofeedback-2794875>

<https://www.mayoclinic.org/tests-procedures/biofeedback/about/pac-20384664>

Point of care:

<https://www.sciencedirect.com/science/article/abs/pii/S0165993620303897>

TENS

<https://my.clevelandclinic.org/health/treatments/15840-transcutaneous-electrical-nerve-stimulation-tens>