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Additional Chief Medical Director(Health & Family Welfare)
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- **Fellow, Indian Public Health Association**
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- **Published/ presented more than 130 scientific papers in National/ International Conferences/ Journals/Books**
- **Awarded Fellowships/Scholarships by World Health Organization (WHO), National Institutes of Health(NIH), USA; Canadian Society for International Health(CSIH), International Clinical Epidemiology Network(INCLEN), and International Society for Priorities in Health Care**
- **Editor, Journal of Academy of Hospital Administration**
- **Vice President, Indian Association of Occupational Health (IAOH), Delhi State Branch and Member, Central Council, IAOH .**
- **Was the First Secretary and Registrar of the Delhi Medical Council (DMC).**
- **Member, Scientific Committee on Epidemiology in Occupational Health, Scientific Committee on Occupational Health and Development and Scientific Committee on Accident Prevention of International Commission on Occupational Health (ICOH)**
- **Accredited NABH Assessor for Hospitals under QCI**

Current Scenario & Future Requirements Of Medical Textiles

MEDICAL TEXTILES

- Textile has always been a part of healthcare.
- Combination of Textile Technology and Medical Sciences has resulted into **MEDICAL TEXTILES.**
- Medical Textiles are one of the faster growing sectors of the global Technical Textile industry.

MEDICAL TEXTILES

- Recently only, application of textiles has started going beyond the usual wound care, incontinence pads, plasters etc.,
- Latest innovation ie., wide variety of woven, non woven, knitted forms of textile increasingly finding their way into a variety of surgical procedures.
- As healthcare industry is growing enormously in India, the demand for the Medical Textile is also on the rise.

Medical Textiles - Current Scenario

Reusable / Durable to Disposable :

- Concept of **reusing linen** of yester year is slowly getting eliminated and shift to **single use disposable products** is the norm of the day in many of the Hospitals.

- Great transformation in the mode of treatment offered by hospitals,encouraging usage of disposables.

- Shift from conventional cutting & preparing of gauze pieces to precut gauze pieces, since 2000.

Shift to disposables – Why ?

- Hospital acquired infection – to prevent.
- Reusable linen - a carrier and source of infection.
- Increased awareness – among medical professionals/ healthcare workers and patients.
- To reduce overall healthcare costs to the nation by using disposables in order to reduce cross infections.
- Surgerywise / procedurewise custom disposable pack /kit.
- Usage of wrappers instead of pink/green cloth covers for trays in CSSD, to retain sterilization and increase the number of days storage.

Shift to disposables – Why ?

- Resistant to liquid penetration (Blood / Water), come into contact from cuts or spattering , results in exposure to pathogens.
- Non linting (Burrs / loose particles will not come out).
- Saving of time and man power in cutting and preparing the gauze pieces.
- Resistant to flame & Infection free nature(barrier against bacteria).

Shift to disposables – Why ?

- Allows air and moisture to pass through(better breathing / better circulation, resulting in surgeon's comfort).

- Economic aspect (linen comes to 10 to 15 cycles, whereas disposable single use and throw. Cost comes to either equal or higher by 15% to 20% that of linen, in case of disposables.

- Ease of use, hygiene and cost effective, by eliminating laundering(washing of 1 ton of linen,7 ton of water – approx. required).

Players dealing in innovative/advance Medical Textile products

1. **Bandages & Wound Care:**

- Kimberly clark
- Beiersdorf
- Battelle Memorial Institute, US
- Perlei Medical, US
- Comvita, NewZeland.
- Imedex Biomateriaux, France.
- 3M
- Smith & Nephew
- Area Labs, US
- J & J, Ethicon, US
- Quick- Med Technologies, US
- Conva Tec,UK.
- Nycomed Pharma, Norway

Players dealing in innovative /advance Medical Textile products

2. Sutures

- Johnson & Johnson,Ethicon, US & UK
- Honeywell International, US
- Poly-Med,US
- Tyco Healthcare, US
- Biotronik, Switzerland

3. Vascular prostheses (grafts)

- W.L.Gore, US
- Edward Life Science, US
- Boston Scientific, US

Players dealing in innovative /advance Medical Textile products

4. Casts / Plasters

- BSN Medical, Germany
- Ossur, Iceland.
- Alcare, Japan

5. Stents

- J & J, Ethicon, US
- Scimed Life Systems, US
- Vascutek, UK

6. Cell growth technology

- Tufts University, US

7. **Cartilage and bone regeneration**

- Bioretec, Finland

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Players dealing in innovative /advance Medical Textile products

8. Nerve reconnection and regeneration

- Asrtra Tec, Sweden.
- Oxford Biomaterials, UK

9. Anti microbial fabrics

- CC Technology Investment, Hong Kong
- Foss Manufacturing Company,US
- Rhodianyl, France

10. Ortho joints

- J & J (Depuy)
- Inor

Role played by fibre - based materials has advanced dramatically in recent years….

- Bioglass fibres used in ***tissue engineering*** to create new bone structures.
- Textile ***scaffolds*** to promote cell growth and build the cell structures
- Textile based ***stents*** (Biocompatible / Biodegradable).
- ***Bandages*** - advanced dressings for wounds and burns, delivering antibiotic and other drugs directly to the parts of the body.
- ***Casts*** – moisture curing resins and glass fibres offering light weight and more comfortable alternative to plaster of Paris.
- Textile fibres and conduits are developed to guide ***nerve reconnection and regeneration.***

Some Innovative products in Medical Textiles

- **Bio functional materials -** active substances are incorporated into fibre by chemical modification or applied onto fibre during spinning process

- These additives get transferred to skin by body moisture or by body heat.

- eg.,anti-allergen finishing agents used to relieve patients from asthma.

Photonic Textiles

- Philips demonstrates **photonic textiles** that turn fabric into intelligent displays.
- eg., a baby jaundice sleeping bag, embedded with blue LEDs to break bilirubin is developed.

Mesh sack

- Manufactured from warp knitted polyester to prevent heart enlargement for patients with degenerative heart failure.

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Medical Textiles production in India yet to gear up, because

- High investment involvement.
- High import duty on machinery.
- Yet to have adequate technology for high value medical - textiles manufacturing.
- More awareness of hygiene required(maintaining high hygiene standards from raw materials to finished products).
- Lack of customized production.
- Absence of converters in India to transform the roll goods into a consumer products.
- Indigenous developments of products to take place in order to bring down the treatment cost.
- R & D to be undertaken on a large scale to make shift from low value to high value products.

Government to finance CENTER OF EXCELLENCE for Medical Textiles

- Union Ministry of Textiles identified **SITRA**, Coimbatore as center of excellence for Medical Textile productions.
- Govt. is granting Rs.100 million over 3 years to center for setting up necessary facilities.
- Lab with international recognition, IT supported information base, training programmes and video conferencing.

Improvement needed in Medical Textile products

A. Scientific study is required with regard to appropriate application of various Medical Textile products.

B. Purpose should be solved.

C. What strength and what construction needed to be standardized, depending upon place of use, i.e., operation room and beds at wards.

D. Total stain free material needed to avoid blood/ Fluid coming in contact with human body.

E. Durability, good-looking and aesthetic, lightweight, adequate strength needed in medical apparels.

Future Requirements of Medical Textiles

- Future Requirements of Medical Textile directly related to growth of Indian Healthcare Sector i.e., increasing in number of Hospitals.
- In India healthcare sector is about **US$ 17 billion** industry, with annual growth rate at **13%** to **17%.**
- By **2012 US$ 36 billion** is Indian healthcare sector's growth estimated.
- Rise in number of **65+** year olds, the segment of population that uses most healthcare products and spends the greatest number of days in the hospitals, leading to Medical Textiles consumptions.

Non Woven Textiles – Market size

- Disposable non woven textiles will dominate Medical Textiles market.Demand for hygiene products will go huge.
- In next **10** years,1 million ton of non woven textiles is the production level expected.
- Current Indian non woven textiles is 70 thousand tons
  (which was the same level in china 15 years ago).
- China producing today 1 million ton of non woven textiles.

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Conclusion

- We have thus so far seen what is the current scenario and what are the future requirements of Medical Textiles.
- Medical Textiles are one of the dynamically expanding sectors and development of same is to convert pain full days of patients into comfortable days.
- As medical procedures continue and transform, the demand for textile materials is bound to grow and grow.

You see things as they are and ask why
But I dream of things that never
were and ask why not….

G. B. Shaw wrote

Kennedy quoted this often

Health is the greatest possession.
Contentment is the greatest treasure.
Confidence is the greatest friend.

Non-being is the greatest joy.

- Lao Tzu

THANKS TO ALL….