



**Biomedical Engineering & Technology Innovation Centre**  
*Connecting doctors, researchers, entrepreneurs and investors  
 for indigenous and affordable medical device innovation*



BETIC– Biomedical Engineering & Technology Innovation Centre was established in 2014 at IIT Bombay to bring doctors, researchers, entrepreneurs and investors together for medical device innovation. The initiative is supported by RG S&T Commission, Mumbai, and DST-NSTEDB, Ministry of S&T, New Delhi. Two satellite centers were set up at COE Pune and VNIT Nagpur, followed by self-supported BETIC cells in four engineering colleges (KJSC Mumbai, MIT-ADT Pune, GHRCE Nagpur and SIU Pune) and seven medical institutes (GMC & JJH Mumbai, MGMIHS Sanpada, HITRT Mumbai, BJMC Pune, DMIMS Wardha and BKLWRH Dervan), making it the largest such network in the country.

The core team comprises about 30 faculty and project managers. More than 120 researchers and students (PhD, Masters, B. Tech) worked at the centers. Many of them incubated their start-up companies or joined healthcare industry. About 100 doctors and industry experts are associated as mentors or facilitators.

A unique model of collaborative innovation from bedside to bench to business to bedside, has been evolved for traversing the ‘valleys of death’ lying between ideation, invention, innovation and impact. It includes four stages: defining an unmet clinical need, developing a novel solution, delivering a tested device, and deploying it in clinical practice. The process is ISO 13485 certified, facilitating regulatory approvals and tech licensing.

- Glaucoma screener** (OKO Icare Solutions)
- Endotracheal block detector** (Atmen Technovention)
- Smart stethoscope** (Ayu Devices)
- Surgery planner** (Algosurg Products)
- Hybrid splint** (Medi Asha Technologies)
- Menstrual cup** (Care Form Labs)
- Diabetic foot screener** (Ayati Devices)
- Knee ankle foot orthosis** (Aumeesh Tech)
- Patient-specific bone scaffold** (DICUL AM)
- Artificial temporal bone** (Nu Ossa Mediquip)
- Centric jaw recorder** (Prosthocentric)
- Mandible surgery guides** (Precisurge)
- Flexible burr** (Aur Innovations)
- Skin spray gun** (Pacify Medical)
- Automatic Suturing** (Denovo Bioinnovations)
- Burn patient isolation** (MedGyor)

The team gathered over 450 unmet clinical needs, developed 240 different proof-of-concepts, and filed 55 patents (+11 PCT applications). Of these, 16 products have been licensed to the start-ups incubated by the researchers and 14 licensed to or developed for local industry partners. Another 30 products are in pipeline. They also developed many patient-specific devices, including 60+ anatomy models for surgery planning, 20+ jigs for resection and a few implants. These resulted in improved surgical outcomes. Over 5000 units of above medical devices sold so far benefited several thousand patients. The start-ups created 60+ high-value jobs.





## THE ESSENCE OF Medical Device Innovation



B Ravi



Among BETIC start-up companies, 15 won the prestigious BIRAC Biotechnology Ignition Grant. Team members also won 60 other awards including Gandhian Young Technological Award, DST India Innovation Growth Programme Medal (3), Google Impact Challenge Award, Emerging Startup of Year, American Bazaar Start-Up Competition, Young Entrepreneur, Indo-Swiss AIT, SICOT Research, SKB Seva Samaj, Maharashtra Startup Week, AI Innovation Challenge, NCPEDP-Mphasis Universal Design, IET IOT Challenge-Healthcare, Infosys Aarohan Social Innovation Award, DST Cawach, Millenium Alliance, NIDHI-Prayas, MeitY TIDE, BIRAC Fast Track and BIPP. The innovators were featured in major national newspapers and magazines such as Forbes India and Outlook Business. Their products were displayed in more than 40 events.

Over 450 engineering and medical students were introduced to med-tech innovation through 12 Medical Device Hackathon (MEDHA) organized at different institutes in Mumbai, Pune, Nagpur, Wardha and Kolhapur. Further, 400 professionals were trained in 6 Medical Device Innovation Camp (MEDIC). These helped in curating clinical needs, identifying potential innovators and entrepreneurs, and seeding the culture in new institutes, bringing them into the BETIC network.

The book 'Essence of Medical Device Innovation' (Crossword, Mumbai, 2017) captures the process evolved at BETIC. The smart stethoscope case study is part of Harvard Business Case Catalogue. Project faculty and researchers also shared their experience through 75 publications and 175 talks in various institutes and workshops.

BETIC process, pipeline, products and people are contributing to med-tech innovation ecosystem in the region and country, leading to affordable healthcare and high-value entrepreneurship. Recent complementary projects supported by government agencies and industry partners are sustaining and scaling up the activities. Please visit us or get in touch to know more!

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