Contents

Human Factors in the Healthcare Environment

Increasing Patient Safety Through Resilient Design: Using Human Factors Engineering and Environmental Support Mechanisms to Reduce Potentials of Hospital Acquired Infection .......................... 3
Lisa Sundahl Platt and Michael Greene

An Ergonomic Evaluation of Preoperative and Postoperative Workspaces in Ambulatory Surgery Centers ................................. 11
Deborah Wingler, Anjali Joseph, and Rutali Joshi

Characteristics of United States Military Personnel and Veterans Who Complete Mindfulness Training ...................................... 22
Baoxia Liu and Valerie J. Rice

Evidence of a Symptom Cluster: The Impact of Mindfulness Meditation on Self-Reported Stress, Fatigue, Pain and Sleep Among U.S. Military Service Members and Veterans ............. 33
Valerie J. Rice and Paul J. Schroeder

Evaluation of Effect on Cognition Response to Time Pressure by Using EEG ................................................................. 45
Shyh-Yueh Cheng

A Pilot Study Evaluating the Utility, Acceptability, and Feasibility of an Abbreviated Mindfulness Meditation Program Before and During Army Warfighting Training ....................... 53
Valerie J. Rice, Gary L. Boykin, Cory R. Overby, Angela Jeter, and Jessica Villarreal
Human Factors in Patient Care Tools

Learning Effects of Perturbation to Postural Control in Diabetics with Neuropathy ................................................. 67
Byungjoon B.J. Kim and Tracey Kim

Considering Ergonomics in the Accident and Emergency Department: Possible or Not .............................................. 73
Ahmad Rasdan Ismail, Shaik Farid Abdull Wahab, and Rohayu Othman

Superficial Electromyography, Motion Analysis and Triggered-Stereo Cameras Technologies Applied to Ultrasound System User Interface Evaluation ................................................................. 80
Federica Vannetti, Tiziana Atzori, Laura Fabbri, Guido Pasquini, Leonardo Forzoni, and Claudio Macchi

Case Study of Integrated Ergonomic Assessment of a Cart-Based High-End Ultrasound System .................................... 90

Development of a Support System for the Presumptive Diagnosis of Glaucoma Through the Processing of Biomedical Images of the Human Eye Fundus in Ecuador .................................................. 100
Eduardo Pinos-Vélez, Susana Encalada, Edwin Gamboa, Vladimir Robles-Bykbaev, William Ipanque, and Carlos Luis Chacón

A RGB-D Sensor Based Tool for Assessment and Rating of Movement Disorders ......................................................... 110
Vitoantonio Bevilacqua, Gianpaolo Francesco Trotta, Claudio Loconsole, Antonio Brunetti, Nicholas Caporusso, Giuseppe Maria Bellantuono, Irio De Feudis, Donato Patruno, Domenico De Marco, Andrea Venneri, Maria Grazia Di Vietro, Giacomo Losavio, and Sabina Ilaria Tatò

A Comprehensive Approach for Physical Rehabilitation Assessment in Multiple Sclerosis Patients Based on Gait Analysis ......... 119
Vitoantonio Bevilacqua, Gianpaolo Francesco Trotta, Antonio Brunetti, Nicholas Caporusso, Claudio Loconsole, Giacomo Donato Cascarano, Francesco Catino, Pantaleo Cozzoli, Giancarlo Delfine, Adriano Mastronardi, Andrea Di Candia, Giuseppina Lelli, and Pietro Fiore

HomeAssist: An Assisted Living Platform for Aging in Place Based on an Interdisciplinary Approach .............................. 129
Charles Consel, Lucile Dupuy, and Hélène Sauzéon

Healthcare Application for Foreigners Living in China .................. 141
Syed Attiqr Rehman, Zhe Chen, and Muhammad Haris
Contents

Train4OrthoMIS Online Course as a Manner of Improving Ergonomics in Orthopaedic Surgery ............................. 149
Joanna Bartnicka, Alicia Piedrabuena, Raquel Portilla,
Juan Luis Moyano-Cuevas, José Blas Pagador,
Francisco M. Sánchez-Margallo, Peter Augat, Dariusz Michalak,
and Jarosław Tokarczyk

Quality Care and Patient Safety: Strategies to Disclose Medical Errors .............................. 159
Jawahar (Jay) Kalra and Ashish Kopargaonkar

Human Factors and Employee Health

Effect of Walking upon Fatigue Due to Monotonous Work ............... 171
Kousuke Aramaki and Hiroshi Hagiwara

Modeling Self-determination in Emotional Labor: Stressful Patient Interactions, Emotion Regulation, and Burnout in Geriatric Nursing .... 180
Severin Hornung, Bettina Lampert, Matthias Weigl, and Jürgen Glaser

Assessment of Postural Analysis in a Dialysis Clinic ............. 193
Kira Andrea C. Chan, John A. Molina, and Denise Ann T. Tirthdas

Most Effective Exercise Load for Burning Body Fat with Aerobic Exercise in Young Japanese Women ............. 205
Tamaki Mitsuno, Miya Nagayasu, Yuko Shinohara, and Yui Ando

Gender Difference and Optimal Carrying Load Limit for Industrial Workers ........................................ 216
Rohit Sharma, Kushal Kamboj, Purshottam Kumar, and Jyoti Bhardwaj

Influence of the Traditional Use of Chumbi in Lumbar Weakness in Women of Ecuadorian Highlands ......................... 229
Thalía San Antonio, Anita Larrea, Fernando Urrutia, María Naranjo,
and María Latta

Analysis of Risk for Repetitive Work Using Thermography Sensory ...... 239
Alejandra García, Claudia Camargo, Jesús Olguín,
and J. Andrés López Barreras

Human Factors in Healthcare

Taxonomy of Communications in the Operating Room ............. 251
Carlos A. Velasquez, Rashid Mazhar, Amer Chaikhouni, Tian Zhou,
and Juan P. Wachs

A Proactive Risk Assessment Framework to Enhance Patient Safety in Operating Rooms .............................. 263
Maryam Tabibzadeh and Gelareh Jahangiri
Lessons Learned from the Implementation of a Specialized Health Care Network in the Municipality of Porto Alegre, Brazil ........... 275
Anna Luiza Bueno Coutinho and Werner Leyh

Effectiveness and User Satisfaction from a Usability Evaluation of a Veterans Benefits Letter ........................................ 287
Nancy J. Lightner, Helen J.A. Fuller, Kyle D. Maddox, Nsikak E. Inyang, and Dennis Lofton

Research on the Development of the Maternity Dress Based on the Health and Safety .................................................. 297
Shang Yuting

Movement Analysis and Ergonomic Garment Opening Design of Garment Block Patterns for Physically Disabled People with Scoliosis Using Fuzzy Logic ........................................ 303
Yan Hong, Xianyi Zeng, Pascal Bruniaux, Antonela Curteza, and Yan Chen

Modeling of Electronic and Mechanical Dimensioning of an Exoskeleton Bottom for Bipedal Gait ................................. 315
Serpa-Andrade Luis, Illescas Francisco, Cuzco William, and Pinos-Velmz Eduardo

Adhesion Distribution Between a Hygiene Mask and a Female Dummy Face via Multiple Approaches ........................... 324
Mika Morishima and Tamaki Mitsuno

Qualitative, Quantitative or Mixed: Which Is the Most Preferred for Healthcare Studies ................................................. 331
Shaik Farid Abdull Wahab, Ahmad Rasdan Ismail, and Rohayu Othman

Service Based Healthcare Monitoring System for the Elderly - Physical Activity and Exercise ................................. 337
Se Jin Park, Murali Subramaniyam, Seunghee Hong, and Damee Kim

Reorganizing Neonatal Resuscitation Equipment Improves Performance Speed Under Simulation Conditions ............... 343
Brenda Law, Po-Yin Cheung, Megan O’Reilly, Caroline Fray, and Georg Schmölzer

Bridging the Gap Between Human Factors and Epidemiological Models: Recommendations for Future Research ............. 352
Anna Paula Galvão Scheidegger and Amarnath Banerjee

Development of Stroke Diagnosis Algorithm Through Logistic Regression Analysis with National Health Insurance Database ....... 364
Seung Nam Min, Kyung-Sun Lee, Se Jin Park, Murali Subramaniyam, and Dong Joon Kim
Evaluation of Ergonomic Risk Factors and Presence of Musculoskeletal Symptoms in Medical Specialty in Echography........... 367
Elena Ochoa-Chaidez, Elvia L. Gonzalez-Muñoz, Enrique Herrera-Lugo, and Jean-Paul Becker

Relationship Between Ergonomic Workstations with Musculoskeletal Disorders and Job Stress Among Staff of Bank in Tehran City........... 378
Tabatabaei Yahyaabadi Shahnaz, Khani Jazani Reza, Kavousi Amir, and Bahreini Maryam

Higher Functioning Teams Improve the Triage Process in Las Cruces, NM .......................................................... 388
Lori DeLeeuw, Nancy Hallbauer, Chris Baeza, Deborah E. Welsh, Gary Sculli, and Crystal Davis-Whited

Healthcare Systems Design

Medical Tourism, Biomedical Wastes and Health Hazard ............. 397
Bela Das

DesignX in the Emergency Department: Requirements of a Digital Antibiogram ......................................................... 406
Isaac Fehr, Lars Mueller, and Eliiah Aronoff-Spencer

Operational Efficiency Analysis of Public Hospital Systems of India: Application of Data Envelopment Analysis ............. 415
Abhik Patra and Pradip Kumar Ray

Human Factors in Medical and Surgical Settings

Ergonomic Assessment and Analysis of Postural Load of Surgeons Performing Laparoscopic Surgeries in Cuenca, Ecuador ........ 427
Mónica Ordóñez-Ríos, Oswaldo Jara-Díaz, Juan C. Salamea, and Vladimir Robles-Bykbaev

Further Development and Evaluation of a Universal Foot Switch for Diverse Medical Disciplines within the Framework of an Open Integration Concept for the Operation Theatre of the Future ........ 438
Anna Vitting, Armin Janß, Benjamin Strathen, Melanie Strake, and Klaus Radermacher

Effects of Noises and Music on Nurses’ Mental Workload and Situation Awareness in the Operating Room ..................... 450
Li-Ping Tseng and Yung-Ching Liu

Preliminary Study of Ontological Process Analysis of Surgical Endoscopy ................................................................. 455
Kazuhiko Shinohara
<table>
<thead>
<tr>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Room Ergonomics: A Practical Approach for Reducing Operating Room Ergonomic Hazards</td>
<td>462</td>
</tr>
<tr>
<td>Yona Vaisbuc, Justin M. Moore, Robert K. Jackler, and John Vaughan</td>
<td></td>
</tr>
<tr>
<td>Incorrect Surgery and Invasive Procedures: Internet Videos Fail to Depict the Full Story</td>
<td>469</td>
</tr>
<tr>
<td>Douglas E. Paull, Robert Kononowech, Sarah Simpson, David M. Sine, and Robin R. Hemphill</td>
<td></td>
</tr>
<tr>
<td>Human Factors in Medical Devices Design</td>
<td></td>
</tr>
<tr>
<td>Teaching Proactive Risk Assessment to Clinicians and Administrators</td>
<td>479</td>
</tr>
<tr>
<td>Tandi Bagian and Helen J.A. Fuller</td>
<td></td>
</tr>
<tr>
<td>Potential and Influence of Industrie 4.0 in Oral Implantology Products and Their Production for Patient, Dentist and Dental Laboratory</td>
<td>488</td>
</tr>
<tr>
<td>Yübo Wang, Oliver Sandig, Christian Steinmetz, Christof Ellerbrock, and Reiner Anderl</td>
<td></td>
</tr>
<tr>
<td>Development of Pneumatic Dual-Cell Stacking Implanter</td>
<td>499</td>
</tr>
<tr>
<td>Yih-Lin Cheng and Yi-Tung Lai</td>
<td></td>
</tr>
<tr>
<td>Human Factors in Prosthesis of Total Knee Arthroplasty</td>
<td>508</td>
</tr>
<tr>
<td>Rene Pimentel, Cristiano Fontes, Salvador Ávila, Jocelma Rios, Adonias Magdiel, Cristiane Fragoso, Ivone Cerqueira, and Caroline Massolino</td>
<td></td>
</tr>
<tr>
<td>Mathematical Modeling and Ergonomic Study of a Pencil Through Numerical Simulation for Support of the Graphological Presumptive Diagnosis</td>
<td>519</td>
</tr>
<tr>
<td>Precise Placement of Precordial Electrodes with +/-0.5 cm Accuracy for Recording ECG in Self-operable Diagnostic Devices</td>
<td>529</td>
</tr>
<tr>
<td>Kavita Shashank, Sakire Arslan Ay, Ankit Fulzele, R.C. Ram, Huan Hu, and Subhanshu Gupta</td>
<td></td>
</tr>
<tr>
<td>A Domotics Control Tool Based on MYO Devices and Neural Networks</td>
<td>540</td>
</tr>
<tr>
<td>Santiago Luna-Romero, Paul Delgado-Espinoza, Fredy Rivera-Calle, and Luis Serpa-Andrade</td>
<td></td>
</tr>
<tr>
<td>Biomimetical Arm Prosthesis: A New Proposal</td>
<td>549</td>
</tr>
<tr>
<td>Daniel Proaño-Guevara, Javier Procel-Feijóo, Johnny Zhingre-Balcazar, and Luis Serpa-Andrade</td>
<td></td>
</tr>
<tr>
<td>Title</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Design of an Intelligent System for Prediction and Simulation of Writing in Children with Spasticity</td>
<td>559</td>
</tr>
<tr>
<td>Privacy and Security of Cardiovascular Implantable Electronic Devices: Applying a Contextual Integrity Analysis</td>
<td>569</td>
</tr>
<tr>
<td>Beth Strickland Bloch and Masooda Bashir</td>
<td></td>
</tr>
<tr>
<td>Method of Ergonomics Assessment of Technical Systems and Its Influence on Operators Heath on Basis of Hybrid Fuzzy Models</td>
<td>581</td>
</tr>
<tr>
<td>Riad Taha Al-Kasasbeh, Nikolay Korenevskiy, Mahdi Salman Alshamasin, and Ilyash Maksim</td>
<td></td>
</tr>
<tr>
<td>Hazard and Safety Analysis of the Integra™ UltraVSTM Neonate Valve</td>
<td>593</td>
</tr>
<tr>
<td>Amber Torrez</td>
<td></td>
</tr>
<tr>
<td>Investigation of Human Factors Engineering Methods Used in Medical Device Procurement Process</td>
<td>600</td>
</tr>
<tr>
<td>Kelly C.D. Lobato, Carlos H.P. Mello, Ana P.S.S. Almeida, and Rodrigo M.A. Almeida</td>
<td></td>
</tr>
<tr>
<td>Usefulness of Skin Punch Tools for Corneal Biopsy</td>
<td>609</td>
</tr>
<tr>
<td>Lore Veelaert, Iris Boons, Anton Carmen, Julie Engelen, Nick Janssens, Clara Devriendt, Nadia Zakaria, and Guido De Bruyne</td>
<td></td>
</tr>
<tr>
<td>Medical Device Design for Improving Orthostatic Hypotension During Supine-to-Stand (STS)</td>
<td>618</td>
</tr>
<tr>
<td>Fong-Gong Wu and XIn-An Chen</td>
<td></td>
</tr>
<tr>
<td>Author Index</td>
<td>631</td>
</tr>
</tbody>
</table>