ISSN 1007-9327 (print)
ISSN 2219-2840 (online)

World Journal of *Gastroenterology*

Weekly Volume 32 Number 39 October 21, 2026

Published by Baishideng Publishing Group Inc

World Journal of

Gastroenterology

Editorial Board

2026-2029

Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
https://www.wjgnet.com

The *World Journal of Gastroenterology* Editorial Board Members are composed of 352 distinguished experts active in the relevant field, distributed in 46 countries/regions, including Italy (66), Japan (54), China (29), United States (29), South Korea (16), Spain (15), Australia (13), Greece (12), Brazil (11), Germany (7), India (7), Romania (7), Taiwan (7), Türkiye (7), United Kingdom (7), Russia (5), Hungary (5), Mexico (4), New Zealand (3), Poland (3), Canada (3), Austria (3), Belgium (3), Croatia (3), Egypt (3), Thailand (3), Sweden (3), Pakistan (2), Argentina (2), France (2), Israel (2), Netherlands (2), Moldova (1), Morocco (1), Jordan (1), Kazakhstan (1), Lebanon (1), Portugal (1), Norway (1), Singapore (1), Slovenia (1), Ireland (1), Albania (1), Estonia (1), United Arab Emirates (1), and Trinidad and Tobago (1).

Editor-in-Chief

Andrzej S Tarnawski, MD, PhD, Professor, (Email: atarnawski@yahoo.com) Department of Gastroenterology Research, University of California Irvine and The Veterans Administration Long Beach Healthcare System, Long Beach, CA 90822, United States

Associate Editor

Antonio Facciorusso, MD, PhD, Full Professor, Director, Gastroenterology Unit, Department of Experimental Medicine, Università del Salento, Lecce 73100, Italy

Jian-Gao Fan, MD, PhD, Professor, Department of Gastroenterology, Shanghai Key Laboratory of Children's Digestion and Nutrition, Xinhua Hospital, Shanghai Jiaotong University School of Medicine, Shanghai 200092, China

Maria Gazouli, PhD, Professor, Basice Medical Sciences, Athens Medical School, Athens 11527, Greece

Zhen-Dong Jin, MD, PhD, Director, Professor, Department of Gastroenterology, Changhai Hospital, Second Military Medical University, Shanghai 200433, China

Tatsuo Kanda, MD, PhD, Professor, Division of Gastroenterology and Hepatology, Uonuma Institute of Community Medicine, Niigata University Medical and Dental Hospital, Minamiuonuma 949-7302, Japan; Department of General Medicine, Uonuma Kikan Hospital, Minamiuonuma 949-7302, Japan

Peter Laszlo Lakatos, MD, PhD, Professor, Division of Gastroenteorlogy, McGill University Health Center, Montreal, QC H3G 1A4, Canada

Hou-Bao Liu, PhD, Chief Physician, Professor, Department of General Surgery, Biliary Tract Disease Center of Zhongshan Hospital Zhongshan Hospital, Fudan University, Shanghai 200032, China

Nahum Mendez-Sanchez, MD, PhD, Professor, Liver Research Unit, Medica Sur Clinic and Foundation, Mexico City 14050, Mexico

Takeshi Suda, MD, PhD, Professor, Department of Gastroenterology and Hepatology, Uonuma Institute of Community Medicine, Niigata University Medical and Dental Hospital, Minami Uonuma, Niigata 949-7302, Japan

Naohisa Yoshida, MD, PhD, Assistant Professor, Department of Molecular Gastroenterology and Hepatology, Kyoto Prefectural University of Medicine, Kyoto 602-8566, Japan

Xian-Jun Yu, MD, PhD, Professor, Department of Oncology, Shanghai Medical College, Fudan University, Shanghai 200032, China

Editorial Board

Zaigham Abbas, Professor, Hepatogastroenterology and Liver Transplantation, Dr. Ziauddin University Hospital, Karachi, Sindh 75600, Pakistan

Sherief Abd-Elsalam, MD, PhD, Associate Professor, Tropical Medicine and Infectious Diseases Department, Faculty of Medicine, Tanta University, Tanta 35127, Egypt

Shahab Abid, MD, PhD, Professor, Section of Gastroenterology at Department of Medicine, Aga Khan University, Karachi 74800, Pakistan

Yasushi Adachi, MD, PhD, Professor, Department of Gastroenterology, Sapporo Medical University, Sapporo 060-8543, Japan

Samir Ahboucha, PhD, Associate Professor, Faculty of Khouribga, Sultan Moulay Slimane University, Khouribga, Settat 25000, Morocco

Yoshio Aizawa, MD, PhD, Professor, Division of Gastroenterology and Hepatology, Department of Internal Medicine, The Jikei University Katsushika Medical Center, Katsushika-ku, Tokyo 1258506, Japan

Amedeo Amedei, Full Professor, Department of Clinical and Experimental Medicine, University of Florence, Florence, Tuscany 50135, Italy

Pietro Andreone, MD, Associate Professor, Professor, Dipartimento di Scienze Mediche e Chirurgiche, University of Bologna, Policlinico Sant'Orsola-Malpighi, Bologna 40138, Italy

Francesco Angelico, MD, Associate Professor, Department of Public Health and Infectious Diseases, Sapienza University of Rome, Rome 00161, Italy

Vito Annese, MD, PhD, Professor, Department of Gastroenterology, Valiant Clinici, City Walk, Dubai, United Arab Emirates

Bruno Annibale, MD, Professor, Medical-Surgical Department of Clinical Sciences and Translational Medicine, Sapienza University of Rome, Rome 00189, Italy

Minoti V Apte, PhD, Professor, Pancreatic Research Group, South Western Sydney Clinical School, University of New South Wales, Sydney, New South Wales 2050, Australia

Makoto Arai, MD, PhD, Professor, Department of Gastroenterology, Tokyo Women's Medical University Yachiyo Medical Center, Yachiyo 276-8524, Japan

Takaaki Arigami, MD, PhD, Department of Digestive Surgery, Breast and Thyroid Surgery, Kagoshima University Graduate School of Medical and Dental Sciences, Kagoshima 890-8520, Japan

Naoki Asano, MD, PhD, Professor, Division of Carcinogenesis and Senescence Biology, Tohoku University Graduate School of Medicine, 47-1 Nodayama, Natori 981-1293, Miyagi, Japan

Paolo Aurello, MD, PhD, Assistant Professor, Dipartimento di Scienze Medico-Chirurgiche e di Medicina Traslazionale, University of Rome "La Sapienza", Rome 00189, Italy

Gian Luca Baiocchi, MD, Associate Professor, Department of Clinical and Experimental Sciences, University of Brescia, Brescia 25127, Italy

Yasemin Hatice Balaban, MD, Professor, Department of Gastroenterology, Hacettepe University, Ankara 06100, Türkiye

Giorgos Bamias, MD, PhD, Associate Professor, GI Unit, 3rd Academic Department of Internal Medicine, National and Kapodistrian University of Athens, Sotiria Hospital, Athens 11526, Greece

Yung-Jue Bang, MD, PhD, Professor, Department of Internal Medicine, Seoul National University College of Medicine, Seoul 110-744, South Korea

Donatella Barisani, MD, Associate Professor, School of Medicine and Surgery, University of Milano-Bicocca, Monza 20900, Italy

Michele Barone, MD, PhD, Section of Gastroenterology, Department of Regenerative and Precision Medicine-Jonian Area, University of Bari, Bari 70124, Italy

Gabrio Bassotti, MD, PhD, Associate Professor, Department of Medicine, Gastroenterology and Hepatology Section, University of Perugia Medical School, San Sisto 06156, Italy

Ian Beales, MD, Assistant Professor, Department of Gastroenterology, Norfolk and Norwich University Hospital, Norwich, Norfolk NR4 7UY, United Kingdom

Trond Berg, PhD, Professor, Department of Biosciences, University of Oslo, Oslo N316, Norway

Madhav Bhatia, PhD, Emeritus Professor, Department of Pathology and Molecular Medicine, University of Otago, Christchurch 8140, New Zealand

Josep M Bordas, MD, PhD, Department of Gastroenterology, Hospital Clinic, Barcelona 08022, Spain

Dmitry S Bordin, MD, PhD, Professor, Department of Pancreatic, Biliary and Upper GI Tract Diseases, A.S. Loginov Moscow Clinical Scientific Center, Moscow 111123, Russia

Lisardo Boscá, PhD, Senior Researcher, Department of Metabolism and Immunology, Instituto de Investigaciones Biomédicas Sols-Morreale (Spanish Research Council and Autonomous University of Madrid), Madrid 28029, Spain

Barbara Braden, PhD, Professor, Translational Gastroenterology Unit, Oxford University Hospitals NHS Foundation Trust, Oxford OX3 9DU, United Kingdom

Luis Bujanda, MD, PhD, Professor, Department of Gastroenterology, Biodonostia Health Research Institute, San Sebastian 33490, Spain

Octavio Caba, PhD, Professor, Department of Human Anatomy and Embriology, University of Granada, Granada 18016, Spain

Giuseppe Maurizio Campo, PhD, Professor, Department of Clinical and Experimental Medicine, University of Messina, Messina 98125, Italy

Guray Can, MD, Associate Professor, Department of Gastroenterology, Bolu Abant İzzet Baysal University, Bolu TR-14280, Türkiye

Claudia Cardoso, PhD, Associate Professor, Professor, Department of Internal Medicine, Federal University of Rio de Janeiro - Universidade Federal do Rio de Janeiro, Rio de Janeiro 22750240, Brazil

Andres F Carrion, MD, Assistant Professor, Postdoctoral Fellow, Division of Gastroenterology and Hepatology, University of Miami Miller School of Medicine, Miami, FL 33136, United States

Lucia Carulli, MD, PhD, Associate Professor, Department of Medicine, Endocrinology, Metabolism and Geriatrics, Univerity of Modena and Reggio Emilia, Modena 41124, Italy

Roberto J Carvalho-Filho, MD, PhD, Division of Gastroenterology, Hepatology Section, Federal University of Sao Paulo, Sao Paulo 04023-060, Brazil

Fernando J Castro, MD, Digestive Disease Center, Cleveland Clinic Florida, Weston, FL 33331, United States

Herwig Cerwenka, MD, Professor, Department of Surgery, Medical University of Graz, Graz A-8036, Austria

Soo-Cheon Chae, PhD, Professor, Department of Pathology, School of Medicine, Wonkwang University, Iksan, Chonbuk 570-749, South Korea

Antonios Chatzigeorgiou, MD, PhD, Assistant Professor, Department of Experimental Physiology, Medical School, National and Kapodistrian University of Athens, Athens 11527, Greece

Júlio Maria Fonseca Chebli, MD, PhD, Associate Professor, Professor, Department of Medicine, Universidade Federal de Juiz de Fora, Juiz de Fora, Minas Gerais 36036-247, Brazil

Adam S Cheifetz, MD, Associate Professor, Assistant Professor, Department of Medicine, Beth Israel Deaconess Medical Center, Boston, MA 02215, United States

Isabelle Andrée Chemin, Professor, Department of Hepatocarcinogenesis and Viral Infection, Centre de Recherche en Cancérologie de Lyon Inserm U1052, Lyon 69003, France

Xiaoxin Chen, MD, PhD, Professor, Cancer Research Program, Julius L Chambers Biomedical Biotechnology Research Institute, North Carolina Central University, Durham, NC 27707, United States

Giuseppe Chiarioni, MD, Division of Gastroenterology, University of Verona, Verona 37122, Italy

Hideyuki Chiba, MD, PhD, Department of Gastroenterology, Omori Red Cross Hospital, Tokyo 143-8527, Japan

King-Wah Chiu, MD, Professor, Division of Hepato-Gastroenterology, Department of Internal Medicine, Chang Gung Memorial Hospital-Kaohsiung Medical Center, Chang Gung University College of Medicine, Kaohsiung 83305, Taiwan

Byung-Ho Choe, MD, PhD, Professor, Department of Pediatrics, School of Medicine, Kyungpook National University, Daegu 41404, South Korea

Kenneth Siu-Ho Chok, MD, Associate Professor, Department of Surgery, Queen Mary Hospital, The University of Hong Kong, Hong Kong 999077, China

Grigorios Christodoulidis, MD, PhD, Department of General Surgery, University Hospital of Larissa, Larissa 41110, Greece

Wan-Long Chuang, MD, PhD, Professor, Hepatobiliary Division, Department of Internal Medicine, Kaohsiung Medical University Hospital, Kaohsiung Medical University, Kaohsiung 807, Taiwan

Halina Cichoż-Lach, MD, Professor, Department of Gastroenterology with Endoscopy Unit, Medical Univeristy of Lublin, Lublin 20-954, Poland

Pilar Codoñer-Franch, PhD, Professor, Department of Pediatrics, Dr. Peset University Hospital, Valencia 46017, Spain

Helen G Coleman, PhD, Professor, Centre for Public Health, Queen's University Belfast, Belfast BT12 6BJ, United Kingdom

Sandro Contini, MD, Associate Professor, Department of Surgical Sciences, Faculty of Medicine, University of Parma, Parma 43126, Italy

Elena Corradini, MD, Associate Professor, Department of Medical and Surgical Sciences for Children and Adults, University of Modena and Reggio Emilia, Modena 41124, Italy

Fernando J Corrales, PhD, Professor, Functional Proteomics Laboratory, National Biotechnology Center (CNB-CSIC), Madrid 28049, Spain

Gaetano Corso, MD, PhD, Professor, Dipartimento di Medicina Clinica e Sperimentale, Università di Foggia, Foggia I-71122, Italy

José Cotter, MD, PhD, Professor, Department of Gastroenterology, Hospital da Senhora da Oliveira, Guimarães 4835-044, Portugal

Bo-Ta Cui, MD, Associate Professor, Department of Microbiota Medicine and Medical Center for Digestive Diseases, The Second Affiliated Hospital of Nanjing Medical University, No. 121 Jiangjiayuan, Nanjing 210011, Jiangsu Province, China

Zhi-Jun Dai, MD, PhD, Professor, Department of Breast Cancer, The First Affiliated Hospital, College of Medicine, Zhejiang University, Hangzhou 310003, Zhejiang Province, China

Andrew S Day, MD, Professor, Department of Paediatrics and Child Health, University of Otago Christchurch, Christchurch 8041, New Zealand

Ângelo Zambam de Mattos, MD, PhD, Graduate Program in Medicine: Hepatology, Federal University of Health Sciences of Porto Alegre, Porto Alegre, Rio Grande do Sul 90020-090, Brazil

Paola De Nardi, MD, Associate Professor, Colorectal Surgical Oncology, Department of Abdominal Oncology, Fondazione Giovanni Pascale IRCCS, Naples 34105, Italy

Cláudia P de Oliveira, MD, PhD, Professor, Department of Gastroenterology, Faculdade de Medicina da Universidade de São Paulo, São Paulo 04126000, Brazil

Giovanni Domenico De Palma, MD, Department of Clinical Medicine and Surgery, "Federico II" University of Naples, Naples 80131, Italy

Emilio De Raffele, MD, PhD, Assistant Professor, Dipartimento dell'Apparato Digerente, Policlinico S.Orsola-Malpighi, University of Bologna, Bologna 40138, Italy

Heitor Siffert Pereira de Souza, MD, PhD, Department of Clinical Medicine, School of Medicine, Federal University of Rio de Janeiro, Rio de Janeiro 21941-913, Brazil

Benedicte Yvonne De Winter, MD, PhD, Professor, Faculty of Medicine and Health Sciences, Laboratory of Experimental Medicine and Pediatrics, University of Antwerp, Antwerp 2610, Belgium

Gian Luigi de'Angelis, MD, PhD, Gastroenterology and Endoscopy Unit, University of Parma, University Hospital of Parma, Parma 43126, Italy

Giuliana Decorti, MD, Associate Professor, Department of Medical, Surgical and Health Sciences, University of Trieste, Institute for Maternal and Child Health - IRCCS "Burlo Garofolo", Trieste 34127, Italy

Francesco Di Mario, MD, Department of Medicine and Surgery, University of Parma, Parma 43126, Italy

Zhi Du, PhD, Professor, Department of Hepatobiliary Surgery, Third Central Hospital of Tianjin, Tianjin 300170, China

Dan Lucian Dumitrascu, MD, PhD, Professor, 2nd Medical Department Cluj County Emergency Clinical Hospital Romania, University of Medicine and Pharmacy Iuliu Hatieganu Cluj-Napoca, Cluj-Napoca, Cluj RO 400006, Romania

Nageshwar Reddy Duvvuru, MD, Department of Medical Gastroenterology, Asian Institute of Gastroenterology, Hyderabad, Telangana 500082, India

Cumali Efe, MD, Associate Professor, Department of Gastroenterology, Harran University, Şanlıurfa 06100, Türkiye

Eli D Ehrenpreis, MD, Professor, Department of Medicine, Rosalind Franklin University Medical School, Chicago, IL 60064, United States

Nikolas Eleftheriadis, MD, Euromedica Kyanous Stauros, Thessaloniki 50200, Greece

Gulsum Ozlem Elpek, MD, Professor, Department of Pathology, Akdeniz University Medical School, Dumlupinar Bulvari, Antalya 07070, Türkiye

Mortada H F El-Shabrawi, MD, Professor, Department of Paediatrics, Kasr Alainy School of Medicine, Cairo University, Cairo 11562, Egypt

Hirayuki Enomoto, MD, PhD, Professor, Division of Hepatobiliary and Pancreatic Diseases, Department of Gastroenterology, Hyogo Medical University, Nishinomiya, Hyogo 663-8501, Japan

Atilla Ertan, MD, Professor, Department of Internal Medicine, Division of Gastroenterology, Hepatology and Nutrition Ertan Digestive Disease Center of Excellence, University of Texas Health McGovern Medical School, Houston, TX 77030, United States

Guy D Eslick, PhD, Professor, Centre for Digestive Health, The University of Newcastle, Newcastle, NSW 2300, Australia

Serag M Esmat, MD, Professor, Department of Internal Medicine, Faculty of Medicine, Cairo University, Cairo 11562, Egypt

Massimiliano Fabozzi, MD, PhD, FACS, Department of Oncological Surgery, Arcispedale Santa Maria Nuova - IRCCS, Oncological Centre of Reggio Emilia, Reggio Emilia, Emilia Romagna 42123, Italy

Daniel T Farkas, MD, Associate Professor, Department of Surgery, BronxCare Health System, Bronx, NY 10457, United States

Matteo Fassan, MD, PhD, Department of Medicine, Surgical Pathology Unit, University of Padua, Padua 35121, Italy

Peter Ferenci, MD, Professor, Internal Medicine III, Gastroenterology and Hepatology, Medical University of Vienna, Wien A-1090, Austria

Conrado M Fernandez-Rodriguez, MD, PhD, Associate Professor, Department of Gastroenterology and Hepatology, Hospital Universitario Fundacion Alcorcon, Service of Gastroenterology, Alcorcon, Madrid 28922, Spain

Giovanna Ferraioli, MD, Department of Clinical, Surgical, Diagnostic and Pediatric Sciences, Medical School University of Pavia, Pavia 27100, Italy

Mirella Fraquelli, MD, PhD, Internal Medicine, Fondazione IRCCS Ca' Granda – Ospedale Maggiore Policlinico, Milano 20122, Italy

De-Liang Fu, MD, PhD, Professor, Department of Pancreatic Surgery, Pancreatic Disease Institute, Huashan Hospital, Shanghai 200040, China

Pietro Fusaroli, MD, Associate Professor, Department of Medical and Surgical Sciences, University of Bologna/Hospital of Imola, Bologna 40121, Italy

Alfred Gangl, MD, Professor, Department of Medicine 3, Division of Gastroenterology and Hepatology, Medical University of Vienna, Allgemeines Krankenhaus, Vienna A-1090, Austria

Diego García-Compeán, MD, Professor, Gastroenterology Service and Department of Internal Medicine, Faculty of Medicine, University Hospital "Dr. José E. González", Universidad Autónoma de Nuevo León, Monterrey, Nuevo León 64700, Mexico

Matteo Garcovich, MD, PhD, Internal Medicine, Gastroenterology and Hepatology, Fondazione IRCSS Agostino Gemelli Hospital, Università Cattolica del Sacro Cuore, Rome 00168, Italy

Pankaj Garg, MD, Department of Colorectal Surgery, Garg Fistula Research Institute, Panchkula, Haryana 134113, India

Nikolaus Gassler, MD, Professor, Institute of Pathology, RWTH Aachen University, Braunschweig 38114, Germany

Tom Johannes Gerardus Gevers, MD, Division of Gastroenterology and Hepatology, Department of Internal Medicine, Maastricht University Medical Center, Maastricht, Limburg 6202 AZ, Netherlands

Paola Ghiorzo, PhD, Assistant Professor, Department of Internal Medicine and Medical Specialties, University of Genoa, Genoa 16132, Italy

Luca Vittorio Gianotti, MD, PhD, Professor, School of Medicine and Surgery, University of Milano-Bicocca, Department of Surgery, San Gerardo Hospital, Monza 20900, Italy

Wataru Gonoi, MD, PhD, Assistant Professor, Department of Radiology, Graduate School of Medicine, The University of Tokyo, Tokyo 1138655, Japan

Mark Gorrell, PhD, Professor, Liver Enzymes in Metabolism and Inflammation Program, Centenary Institute and University of Sydney, Sydney, NSW 2006, Australia

Alberto Grassi, MD, PhD, Department of Internal Medicine and Hepatology, Infermi Hospital, Rimini 47921, Italy

Gabriele Grassi, MD, PhD, Associate Professor, Department of Life Sciences, University Hospital of Cattinara, Trieste 34149, Italy

Michal Grąt, MD, PhD, Department of General, Transplant and Liver Surgery, Medical University of Warsaw, Warsaw 02-097, Poland

Antonietta Gerarda Gravina, PhD, MD, Associate Professor, Department of Precision Medicine, Gastroenterology Unit, University of Campania "Luigi Vanvitelli", Naples 80138, Italy

Antonio Grieco, MD, Associate Professor, Liver Transplant Medicine, Fondazione Policlinico Universitario A. Gemelli IRCCS, Università Cattolica del Sacro Cuore, Roma, Institute of Internal Medicine, Rome 00168, Italy

Fabio Grizzi, PhD, Department of Immunology and Inflammation, Humanitas Clinical and Research Hospital, Rozzano 20089, Italy

Samir C Grover, MD, Assistant Professor, Division of Gastroenterology, St. Michael's Hospital, University of Toronto, Toronto, Ontario M5B1W8, Canada

Sushovan Guha, MD, PhD, Professor, Department of Internal Medicine, University of Texas Health Science Center, Houston, TX 77030, United States

Chisato Hamashima, MD, PhD, Professor, Faculty of Medical Tecnology, Teikyo University, Tokyo 1738605, Japan

Ken Haruma, MD, PhD, Professor, Department of Internal Medicine 2, Kawasaki Medical School Kawasaki Hospital, Okayama 701-0192, Japan

Naoki Hashimoto, MD, PhD, Professor, Department of Surgery, Kindai University, Osaka 577-8502, Japan

Goran Hauser, MD, PhD, Associate Professor, Department of Internal Medicine, Division of Gastroenterology, Clinical Hospital Centre, Medical Faculty, Faculty of Health Studies, University of Rijeka, Rijeka 51000, Croatia

Koichi Hayano, MD, PhD, Associate Professor, Department of Frontier Surgery, Chiba University Graduate School of Medicine, Chiba-shi 260-8677, Japan

Paul Henderson, PhD, Child Life and Health, University of Edinburgh, Edinburgh EH16 4TJ, United Kingdom

Harald Peter Hoensch, MD, Professor, Marien Hospital Medical Department, Private Practice in Internal Medicine and Gastroenterology, Darmstadt D-64285, Germany

Gordon Stanley Howarth, PhD, Professor, School of Animal and Veterinary Sciences, University of Adelaide, Roseworthy, South Australia 5371, Australia

Ping-I Hsu, MD, Professor, Division of Gastroenterology and Hepatology, Department of Internal Medicine, Kaohsiung Veterans General Hospital, Kaohsiung 813, Taiwan

Jun-Te Hsu, MD, Professor, Department of Surgery, Chang Gung Memorial Hospital, Taoyuan County and Chang Gung Medicine Colledge, Taoyuan 333, Taiwan

Bing-Sheng Huang, PhD, Associate Professor, Medical AI Lab, School of Biomedical Engineering, Health Science Centre, Shenzhen University, Shenzhen 518000, Guangdong Province, China

Chang-Ming Huang, MD, PhD, Professor, Department of Gastric Surgery, Fujian Medical University Union Hospital, Fuzhou 350001, Fujian Province, China

Jia-Ling Huang, MD, PhD, Assistant Professor, Department of Pathology, Geisinger Medical Center, Geisinger Commonwealth School of Medicine, 100 N Academy Ave, Danville, PA 17822, United States

Calogero Iacono, MD, Associate Professor, Department of Surgical Sciences, Dentistry, Gynecology and Pediatrics, Division of General and Hepatobiliary Surgery, University of Verona, Verona 37134, Italy

Mostafa Ibrahim, MD, Assistant Professor, Department of Gastroenterology, Hepatopancreatology and Digestive Oncology, Erasme Hospital, Brussels B-1070, Belgium

Enzo Ierardi, MD, Associate Professor, Section of Gastroenterology, Department of Emergency and Organ Transplantation, University of Bari, Bari, BA 70124, Italy

Masahiro Iizuka, MD, PhD, Akita Health Care Center, Akita Red Cross Hospital, Akita City, Akita 010-0001, Japan

Yoshihiro Ikura, MD, Professor, Department of Pathology, Takatsuki General Hospital, Takatsuki, Osaka Prefecture 569-1192, Japan

Hiroyuki Imaeda, MD, Professor, Department of Gastroenterology, Saitama Medical University, Iruma-gun, Saitama 350-0495, Japan

Kazuaki Inoue, MD, PhD, Associate Professor, Department of Internal Medicine, Division of Gastroenterology, Showa University Fujigaoka Hospital, Yokohama 227-8501, Japan

Raffaele Iorio, MD, Associate Professor, Department of Translational Medical Science, Section of Pediatrics, University Federico II, Naples 80131, Italy

Paola Iovino, MD, Associate Professor, Department of Medicine, Surgery and Dentistry, Scuola Medica Salernitana, University of Salerno, Baronissi, Salerno 84081, Italy

Shuji Isaji, MD, PhD, Professor, Department of Hepatobiliary Pancreatic and Transplant Surgery, Mie University Graduate School of Medicine, Tsu, Mie 514-8507, Japan

Vasily Isakov, MD, PhD, Professor, Department of Gastroenterology and Hepatology, Federal Research Center of Nutrition, Biotechnology and Food Safety, Moscow 115446, Russia

Toru Ishikawa, MD, Department of Gastroenterology and Hepatology, Saiseikai Niigata Hospital, Niigata 950-1104, Japan

Masaya Iwamuro, MD, PhD, Assistant Professor, Department of Gastroenterology and Hepatology, Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences, Okayama 700-8558, Japan

Yoshiaki Iwasaki, MD, PhD, Professor, Health Service Center, Okayama University, Okayama 700-8530, Japan

Khaled Ali Jadallah, MD, Associate Professor, Department of Internal Medicine, King Abdullah University Hospital, Faculty of Medicine, Jordan University of Science and Technology, Irbid 22110, Jordan

Jeong Won Jang, MD, PhD, Associate Professor, Department of Internal Medicine, The Catholic University of Korea, Seoul 06591, South Korea

Kalpesh Jani, MD, Department of Gastrointestinal and Minimal Access Surgery, Vadodara Institute of Gastrointestinal and Obesity Surgery, Vadodara, Gujarat 390011, India

Harindra Jayasekara, MD, PhD, Melbourne School of Population and Global Health, The University of Melbourne, Melbourne, Victoria 3010, Australia

Robert Thomas Jensen, MD, Digestive Diseases Branch, National Institutes of Health, Bethesda, CA 20892, United States

Guang Ji, MD, PhD, Professor, Institute of Digestive Diseases, Longhua Hospital, Shanghai University of Traditional Chinese Medicine, Shanghai 200032, China

Wei Jiang, MD, PhD, Professor, Department of Gastroenterology, Zhongshan Hospital, Fudan University, Shanghai 200032, China

Miguel Jiménez Pérez, MD, PhD, Assistant Professor, UGC de Aparato Digestivo, Unidad de Hepatología-Trasplante Hepático, Hospital Regional Universitario de Málaga, Málaga 29010, Spain

Young Do Jung, MD, PhD, Professor, Department of Biochemistry, Chonnam National Universtiy Medical School, Jeonnam 58138, South Korea

Satoru Kakizaki, MD, PhD, Assistant Professor, Associate Professor, Department of Internal Medicine, Division of Gastroenterology and Hepatology, Gunma University Graduate School of Medicine, Maebashi 3718511, Japan

Yoshihiro Kamada, MD, PhD, Professor, Department of Advanced Metabolic Hepatology, Graduate School of Medicine, The University of Osaka, Suita 565-0871, Osaka, Japan

Hiroteru Kamimura, MD, PhD, Assistant Professor, Division of Gastroenterology and Hepatology, Niigata University Graduate School of Medical and Dental Sciences, Chuo-ku, Niigata 951-8510, Japan

Georgios Karamanolis, MD, PhD, Associate Professor, Department of Gastroenterology, Medical School, National and Kapodistrian University of Athens, Athens 11527, Greece

Rashmi Kaul, PhD, Professor, Department of Biochemistry and Microbiology, Oklahoma State University-Center for Health Sciences, Tulsa, OK 74107, United States

Kazumichi Kawakubo, MD, PhD, Assistant Professor, Department of Gastroenterology and Hepatology, Faculty of Medicine and Graduate School of Medicine, Hokkaido University, Sapporo 0608638, Japan

Sahil Khanna, MD, Assistant Professor, Division of Gastroenterology and Hepatology, Mayo Clinic, Rochester, MN 55905, United States

In Hee Kim, MD, PhD, Professor, Department of Internal Medicine, Chonbuk National University Hospital, Jeonju, Jeonbuk 561-712, South Korea

Seung Up Kim, MD, PhD, Associate Professor, Department of Internal Medicine, Yonsei University College of Medicine, Seoul 03722, South Korea

Byung Joo Kim, PhD, Professor, School of Korean Medicine, Pusan National University, Yangsan 50612, South Korea

Dong Joon Kim, MD, PhD, Professor, Department of Internal Medicine, Hallym University College of Medicine Institute for Liver and Digestive Diseases, Hallym University, Hallym University Chuncheon Sacred Heart Hospital, Gangwon-do 24253, South Korea

Donghee Kim, MD, PhD, Associate Professor, Division of Gastroenterology and Hepatology, Stanford University School of Medicine, Stanford, CA 94304, United States

Gwang Ha Kim, MD, PhD, Professor, Division of Gastroenterology, Department of Internal Medicine and Biomedical Research Institute, Pusan National University Hospital, Busan 49241, South Korea

Hideaki Kinugasa, MD, PhD, Assistant Professor, Department of Gastroenterology and Hepatology, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, Okayama 700-8558, Japan

Yasuhiro Koga, MD, PhD, Professor, Department of Gastroenterology, Tokai University School of Medicine, Isehara, Kanagawa 259-1193, Japan

Bledar Kraja, MD, PhD, Professor, Department of Biomedical Sciences, Physiology Section, Faculty of Medicine, University Hospital Center Mother Teresa, University Clinic of Gastrohepatology, Tirana 1001, Albania

Wolfgang Kreisel, MD, Department of Medicine II, Gastroenterology, Hepatology, Endocrinology, and Infectious Diseases, Faculty of Medicine, Medical Center - University of Freiburg, Freiburg 79106, Germany

Somashekar G Krishna, MD, Professor, FACG, FASGE, AGAF, Division of Gastroenterology, Hepatology, and Nutrition, The Ohio State University Wexner Medical Center, Columbus, OH 43210, United States

Veerapol Kukongviriyapan, PhD, Associate Professor, Department of Pharmacology, Faculty of Medicine, Khon Kaen University, Muang, Khon Kaen 40002, Thailand

Vincenzo La Mura, MD, PhD, Associate Professor, Department of Pathophysiology and Transplantation, University of Milan, Fondazione IRCCS Ca' Granda, Ospedale Maggiore Policlinico-University of Milan, Milan 20122, Italy

Quirino Lai, MD, PhD, Transplant Unit, Sapienza University of Rome, Rome 00161, Italy

Daniela Cornelia Lazăr, PhD, Associate Professor, Department of Internal Medicine I, The University of Medicine and Pharmacy "Victor Babes" Timisoara, Timisoara 300041, Romania

Vijittra Leardkamolkarn, PhD, Professor, Associate Professor, Department of Anatomy, Mahidol University, Bangkok 10400, Thailand

Kyu Taek Lee, MD, PhD, Professor, Department of Gastroenterology, Samsung Medical Center, Sungkyunkwan University School of Medicine, 50 Ilwon-Dong, Seoul 135710, South Korea

Soo-Youn Lee, MD, PhD, Professor, Department of Laboratory Medicine and Genetics, Samsung Medical Center, Sungkyunkwan University School of Medicine, 50 Ilwon-Dong, Gangnam-gu, Seoul 135-710, South Korea

Sung-Chul Lim, PhD, MD, Professor, Department of Pathology, Chosun University Hospital, Gwangju 501-717, South Korea

Alexander Link, MD, PhD, Associate Professor, Professor, Department of Gastroenterology, Hepatology and Infectious Diseases, Otto-von-Guericke University Hospital Magdeburg, Magdeburg 39120, Germany

Zheng-Wen Liu, MD, PhD, Professor, Department of Infectious Diseases, First Affiliated Hospital of Xi'an Jiaotong University, Xi'an 710061, Shaanxi Province, China

Hui-Kang Liu, PhD, Division of Basic Chinese Medicine, National Research Institute of Chinese Medicine, Taipei 112, Taiwan

Ana Lleo, MD, PhD, Associate Professor, Department of Biomedical Science, Humanitas University, Pieve Emanuele, Milan 20090, Italy

Johannes-Matthias Löhr, MD, Professor, Department of Clinical Science, Intervention, and Technology, Karolinska University Hospital, Stockholm 14186, Sweden

Amedeo Lonardo, MD, Professor, Department of Internal Medicine, Azienda Ospedaliero-Universitaria di Modena, Modena 41126, Italy

Xi-Dai Long, MD, PhD, Professor, Department of Pathology, The Affiliated Hospital of Youjiang Medical University for Nationalities, Baise 533000, Guangxi Zhuang Autonomous Region, China

Misha D P Luyer, MD, PhD, Department of Surgery, Catharina Hospital, Eindhoven 5623 EJ, Netherlands

Ming-Zhe Ma, MD, Assistant Professor, Department of Gastric Surgery, Fudan University Shanghai Cancer Center, Shanghai 200032, China

Tomasz Hubert Mach, MD, PhD, Professor, Department of Gastroenterology and Hepatology, Jagiellonian University Medical College, University Hospital, Cracow 31-531, Poland

Govind K Makharia, MD, Professor, Department of Gastroenterology and Human Nutrition, All India Institute of Medical Sciences, New Delhi, Delhi 110029, India

Emanuel K Manesis, MD, Professor, Department of Intenal Medicine, Athens University School of Medicine, Athens 104 34, Greece

Francesco Manguso, MD, PhD, Department of Gastroenterology, Azienda Ospedaliera Di Rilievo Nazionale Antonio Cardarelli, Napoli 80131, Italy

Lorenzo Mannelli, MD, PhD, Assistant Professor, Department of Radiology, SDN, Naples 80143, Italy

Ivana Maric, MD, PhD, Professor, Department of Anatomy, Faculty of Medicine, University of Rijeka, Rijeka 51000, Croatia

José Manuel Martin-Villa, PhD, Professor, Departamento de Inmunología, Oftalmología y ORL, Facultad de Medicina, Universidad Complutense de Madrid, Madrid 28040, Spain

Luca Mastracci, MD, Full Professor, Department of Surgical Sciences and Integrated Diagnostics, University of Genoa and Ospedale Policlinico San Martino, Genoa 16132, Italy

Yoichi Matsuo, MD, PhD, Professor, Department of Gastroenterological Surgery, Nagoya City University Graduate School of Medical Sciences, Nagoya 4678601, Japan

Mark C Mattar, MD, Associate Professor, Department of Gastroenterology, MedStar Georgetown University Hospital, Washington, DC 20007, United States

Julio Mayol, MD, PhD, Professor, Department of Surgery, Universidad Complutense de Madrid Medical School, Hospital Clinico San Carlos, Madrid 28040, Spain

Giuseppe Mazzarella, PhD, Unit of Immunobiology, Laboratory of Immunomorphology, Institute of Food Sciences, National Council Research, Avellino 83100, Italy

Neil Donald Merrett, MD, Professor, Department of Surgery, University of Western Sydney, Penrith, NSW 2571, Australia

Pal Miheller, MD, PhD, Professor, Department of Surgery, Transplantation and Gastroenterology, Semmelweis University, Budapest, Pest H-1088, Hungary

Marco Milone, MD, PhD, Associate Professor, Clinical Medicine and Surgery, "Federico II" University of Naples, Naples 80131, Italy

Eiji Miyoshi, MD, PhD, Professor, Department of Molecular Biochemistry and Clinical Investigation, Osaka University Graduate School of Medicine, Suita, Osaka 565-0871, Japan

Toru Mizuguchi, MD, PhD, Professor, Department of Nursing and Surgical Science, Sapporo Medical University Postgraduate School of Health Science, Sapporo, Hokkaido 0608556, Japan

Dimitrios-Paraskevas Moris, MD, PhD, Department of Surgery, Duke University Medical Center, Durham, NC 27710, United States

Sergey Morozov, PhD, MD, Department of Gastroenterology, Hepatology and Nutrition, Federal Research Center of Nutrition and Biotechnology, 21 Kashirskoye Shosse, Moscow 115446, Russia

David L Morris, MD, FRCS (Ed), Professor, Department of Surgery, University of New South Wales, Sydney, New South Wales 2217, Australia

Naofumi Mukaida, MD, PhD, Professor, Division of Molecular Bioregulation, Cancer Research Institute, Kanazawa University, Kanazawa, Ishikawa 920-1192, Japan

Sandeep Mukherjee, Professor, Department of Internal Medicine, Creighton University Medical Center, Omaha, NE 68124, United States

Atsuhiko Murata, MD, PhD, Chief Physician, Department of Preventive Medicine and Community Health, School of Medicine, University of Occupational and Environmental Health, Fukuoka 8078555, Japan

Hikaru Nagahara, MD, PhD, Professor, Department of Gastroenterology, Saiseikai Kurihashi Hospital, Kuki-shi, Saitama-ken 349-1105, Japan

Masaki Nagaya, MD, PhD, Professor, Meiji University International Institute for Bio-Resource Research, Meiji University, Kawasaki 214-8571, Japan

Hiroshi Nakano, MD, PhD, Associate Professor, Department of Gastroenterological Surgery, St. Marianna University Hospital, Kawasaki, Kanagawa 216-8511, Japan

Shivananda Nayak, PhD, Professor, Department of Preclinical Sciences, Faculty of Medical Sciences, The University of The West Indies, Mount Hope, Trinidad and Tobago

Lucian Negreanu, MD, PhD, Associate Professor, Department of Internal Medicine II, Internal Medicine II Gastroenterology, University Hospital Bucharest, Bucharest 050098, Romania

Matthias Ocker, MD, Professor, Department of Medical, Division of Hematology, Oncology, and Cancer Immunology, Campus Charité Mitte, Charité University Medicine Berlin, Berlin 10117, Germany

Shogo Ohkoshi, MD, PhD, Professor, Department of Internal Medicine, School of Life Dentistry at Niigata, The Nippon Dental University, Niigata 951-8580, Japan

Satoshi Ono, MD, PhD, Department of Gastroenterology and Gastrointestinal Endoscopy, Tokyo Metropolitan Institute for Geriatrics and Gerontology, Tokyo 173-0015, Japan

Shozo Osera, MD, PhD, Chief Physician, Department of Gastroenterology, Saku Central Hospital Advanced Care Center, Saku, Nagano 385-0051, Japan

Motoyuki Otsuka, MD, Assistant Professor, Department of Gastroenterology, Graduate School of Medicine, University of Tokyo, 7-3-1 Hongo, Bunkyo-ku, Tokyo 113-8655, Japan

Hasan Ozen, MD, Professor, Department of Pediatrics, Division of Gastroenterology, Hepatology and Nutrition, Hacettepe University School of Medicine, Ankara 06100, Türkiye

Salvatore Paiella, MD, Assistant Professor, General and Pancreatic Surgery Unit, Pancreas Institute, University of Verona Hospital Trust, GB Rossi Hospital, Verona 37129, Italy

Arturo Panduro, MD, PhD, Department of Molecular Biology in Medicine, Civil Hospital of Guadalajara Fray Antonio Alcalde/University of Guadalajara, Guadalajara, Jalisco 44280, Mexico

Won Sang Park, MD, PhD, Professor, Department of Pathology, College of Medicine, The Catholic University of Korea, Seoul 137-701, South Korea

Kwan-Kyu Park, MD, PhD, Professor, Department of Pathology, Catholic University of Daegu, Daegu 42472, South Korea

Rinaldo Pellicano, MD, Professor, Gastroenterology Unit, AOU Città della Salute e della Scienza, Turin 10100, Italy

Gianluca Pellino, MD, PhD, Associate Professor, Colorectal Unit, Department of General and Digestive Surgery, Vall d'Hebron University Hospital; General, Digestive, Thoracic Surgery and Liver Transplantation (CIRCATH) Group, Vall d'Hebron Research Institute (VHIR); Universitat Autonoma de Barcelona (UAB), Barcelona 08035, Spain

Angela Peltec, MD, PhD, Associate Professor, Department of Internal Medicine, Discipline of Gastroenterology, State University of Medicine and Pharmacy "Nicolae Testemitanu", Chishinev 2019, Moldova

Enrique Perez-Cuadrado-Robles, MD, PhD, Department of Gastroenterology, Cliniques Universitaires Saint-Luc., Bruxelles 1200, Belgium

Marcos V Perini, MD, PhD, Associate Professor, Department of Surgery, The University of Melbourne, Melbourne, Victoria 3084, Australia

Martina Perse, PhD, Institute of Pathology, Medical Experimental Centre, University of Ljubljana, Faculty of Medicine, Ljubljana 1000, Slovenia

Antonio Picardi, MD, PhD, Associate Professor, Professor, Unit of Internal Medicine and Hepatology, Department of Medicine, University Campus Bio-Medico, Rome 00128, Italy

Federico Piñero, MD, Hepatology and Liver Transplant Unit, Hospital Universitario Austral, Buenos Aires B1629HJ, Argentina

Dimitri Poddighe, MD, PhD, Associate Professor, Department of Medicine, Nazarbayev University School of Medicine, Astana 010000, Kazakhstan

Piero Portincasa, MD, PhD, Department of Biomedical Sciences and Human Oncology, University of Bari Medical School, Bari 70124, Italy

Bogdan Procopet, MD, PhD, Assistant Professor, 3rd Medical Department, "Iuliu Haţieganu" University of Medicine and Pharmacy, Institute for Gastroenterology and Hepatology "Prof. Dr. O. Fodor", Cluj-Napoca 400126, Romania

Chun-Feng Qu, MD, PhD, Professor, Department of Immunology, National Cancer Center/Cancer Hospital, Chinese Academy of Medical Sciences and Peking Union Medical College, Beijing 100021, China

Zoltán Rakonczay Jr, MD, PhD, Professor, Department of Pathophysiology, University of Szeged, Szeged 6701, Hungary

José M Ramia, MD, PhD, Associate Professor, Department of Surgery, University General Hospital of Alicante, Alicante 03010, Spain

Timo Rath, MD, PhD, Department of Internal Medicine 1, Division of Gastroenterology, Ludwig Demling Endoscopy Center of Excellence, Friedrich-Alexander-University, Erlangen Nuernberg, Erlangen 91054, Germany

Pradip Raychaudhuri, PhD, Professor, Department of Biochemistry and Molecular Genetics (M/C 669), University of Illinois, College of Medicine, 900S. Ashland Ave., Chicago, IL 60607, United States; Jesse Brown VA Medical Center, 820S. Damen Ave., Chicago, IL 60612, United States

Zhi-Gang Ren, MD, PhD, Associate Chief Physician, Chief Physician, Postdoctoral Fellow, Department of Infectious Diseases, State Key Laboratory of Antiviral Drugs, Pingyuan Laboratory, The First Affiliated Hospital of Zhengzhou University, Jianshe East Road, Zhengzhou 450052, Henan Province, China

Vasiliy Ivanovich Reshetnyak, MD, Full Professor, Department of Propaedeutics of Internal Diseases and Gastroenterology, Russian University of Medicine, Moscow 127473, Russian

J Marc Rhoads, MD, Professor, Department of Pediatrics, Division of Gastroenterology, Hepatology, and Nutrition, McGovern Medical School, The University of Texas Health Science Center at Houston, Houston, TX 77030, United States

Luciana Rigoli, MD, Professor, Department of Human Pathology in Adult and Developmental Age "G. Barresi", University of Messina, Messina 98125, Italy

Seungil Ro, PhD, Associate Professor, Department of Physiology and Cell Biology, Reno School of Medicine, University of Nevada, Reno, NV 89557, United States

Ricardo Robles, PhD, MD, Professor, Department of Surgery and Organ Transplantation, Virgen de la Arrixaca University Hospital, Murcia 30120, Spain

Raquel Rocha, PhD, Professor, Department of Sciences of Nutrition, School of Nutrition, Federal University of Bahia, Rua Basílio da Gama, 200-Canela, Salvador, BA 40110-040, Brazil

Francisco Rodriguez-Frias, PhD, Associate Professor, Senior Researcher, Liver Pathology Unit, Biochemistry and Microbiology Departments, Hospital Universitari Vall d'Hebron, Barcelona 08035, Spain

Udo Rolle, MD, PhD, Professor, Department of Pediatric Surgery and Pediatric Urology, University Hospital, Goethe University Frankfurt/M, Frankfurt 60590, Germany

Luca Roncucci, MD, PhD, Associate Professor, Assistant Professor, Department of Diagnostic and Clinical Medicine, and Public Health, University of Modena and Reggio Emilia, Policlinico, Modena 41125, Italy

Joan Rosello-Catafau, PhD, Professor, Department of Experimental Pathology, Institute of Biomedical Research of Barcelona, Barcelona, Catalunya 08036, Spain

Kamran Rostami, MD, PhD, Department of Gastroenterology, MidCentral DHB Palmerston Hospital, Palmerston North 4472, New Zealand

Takao Sakai, MD, PhD, Professor, Department of Diagnostic Pathology, Fujita Health University, Toyoake, Aichi 4701192, Japan

Madhusudana Girija Sanal, PhD, Associate Professor, Department of Molecular and Cellular Medicine, Institute of Liver and Biliary Scieneces, New Delhi, Delhi 110070, India

Ken Sato, MD, PhD, Professor, Department of Healthcare Informatics, Takasaki University of Health and Welfare, 37-1 Nakaorui-machi, Takasaki, Gunma 370-0033, Japan

Hildegard M Schuller, PhD, Professor, Department of Biomedical and Diagnostic Sciences, College of Veterinary Medicine, University of Tennessee Knoxville, Knoxville, TN 37996, United States

Annalucia Serafino, PhD, Senior Researcher, Institute of Translational Pharmacology, National Research Council of Italy, Rome 00133 , Italy

Neal Shahidi, MD, PhD, Assistant Professor, Department of Medicine, St Paul's Hospital, Division of Gastroenterology, Vancouver, British Columbia V6Z 1Y6, Canada

Ala I Sharara, MD, Professor, Division of Gastroenterology, Department of Internal Medicine, American University of Beirut Medical Center, Beirut 1107 2020, Lebanon

Vishal Sharma, MD, Associate Professor, Department of Gastroenterology, Postgraduate Institute of Medical Education and Research, Chandigarh 160012, India

Sunil G Sheth, MD, Associate Professor, Department of Medicine, Division of Gastroenterology, Beth Israel Deaconess Medical Center, Harvard Medical School, Boston, MA 02215, United States

Rui-Hua Shi, MD, PhD, Professor, Department of Gastroenterology, Southeast University, Zhongda Hospital, Nanjing 210009, Jiangsu Province, China

Qiang Shi, PhD, Associate Professor, Endoscopy Center, Zhongshan Hospital of Fudan University, Shanghai 200032, China

Yukihiro Shimizu, MD, PhD, Gastroenterology Center, Nanto Municipal Hospital, Nanto, Toyama 932-0211, Japan

Noam Shussman, MD, Department of General Surgery, Hadassah Hebrew University Medical Center, Jerusalem 91120, Israel

Giuseppe Sica, MD, PhD, Associate Professor, Department of Surgery, Tor Vergata University Hospital, Rome 00133, Italy

Predrag Sikiric, MD, PhD, Department of Pharmacology, School of Medicine, University of Zagreb, Zagreb 10000, Croatia

Aytan Sipahi, PhD, Assistant Professor, Department of Gastroenterology and Hepatology, University of São Paulo School of Medicine - LIM 07, São Paulo, SP 01246-903, Brazil

Ferenc Sipos, MD, PhD, Department of Hematology and Internal Medicine, Semmelweis University, Budapest 1088, Hungary

Stanislav Sitkin, MD, PhD, Associate Professor, Functional Metabolomics and Human Microbiome Research Group, Almazov National Medical Research Centre, Department of Internal Diseases, Gastroenterology and Dietetics, North-Western State Medical University named after I.I. Mechnikov, St. Petersburg 190000, Russia

Sinead M Smith, PhD, Assistant Professor, Department of Clinical Medicine, Trinity College Dublin, Dublin D24, Ireland

Ross Cyril Smith, MD, Professor, Division of Surgery, Head of the Cancer Surgery Research Laboratory, Kolling Institute, University of Sydney, StLeonards, NSW 2065, Australia

Rosa Leonôra Salerno Soares, MD, PhD, Professor, Department of Internal Medicine, Faculty of Medicine, Federal Fluminense University, Niterói, Rio de Janeiro 24030210, Brazil

Myeong Jun Song, PhD, Associate Professor, Department of Internal Medicine, Daejeon St. Mary's Hospital, College of Medicine, The Catholic University of Korea, Daejeon 301-723, South Korea

Maurizio Soresi, MD, Associate Professor, Department of Health Promotion Sciences, Maternal and Infant Care, Internal Medicine and Medical Specialties (PROMISE), University of Palermo, Palermo 90127, Italy

Cosimo Sperti, MD, Associate Professor, Professor, Department of Surgery, Oncology and Gastroenterology, 1st General Surgery, University of Padua, Padua 35128, Italy

Giovanni Squadrito, MD, Professor, Clinical and Molecular Hepatology Unit, Department of Internal Medicine, University of Messina, Messina 98124, Italy

Carol Stanciu, Professor, Department of Gastroenterology, "Grigore T. Popa" University of Medicine and Pharmacy, "St. Spiridon" University Hospital, Institute of Gastroenterology and Hepatology, Iasi 700111, Romania

Adrian John Stanley, MD, Professor, Department of Gastroenterology, Glasgow Royal Infirmary, Glasgow G4 0SF, United Kingdom

Gabriele Stocco, PhD, PharmD, Associate Professor, Department of Medical, Surgical and Health Sciences, University of Trieste/Institute for Maternal and Child Health IRCCS Burlo Garofolo, Trieste 34127, Italy

Letitia Adela Maria Streba, MD, PhD, Professor, Department of Internal Medicine 1, Filantropia University Hospital, Craiova 200349, Romania

Koichi Suda, Professor, Department of Surgery, Fujita Health University, Toyoake, Aichi 470-1192, Japan

Mitsushige Sugimoto, MD, PhD, AGAF, Professor, Division of Genome-Wide Infectious Microbiology, Research Center for GLOBAL and LOCAL Infectious Disease, Oita University, 1-1 Idaigaoka, Hasama, Yufu, Oita 879-5593, Japan

Haruhiko Sugimura, MD, PhD, Professor, Department of Tumor Pathology, Hamamatsu University School of Medicine, Hamamatsu 431-3192, Japan

Keith Sultan, MD, Assistant Professor, Division of Gastroenterology, Northwell Health, North Shore University Hospital and Long Island Jewish Medical Center, Great Neck, NY 10021, United States

Si-Yu Sun, MD, PhD, Professor, Department of Gastroenterology, Shengjing Hospital of China Medical University, Shenyang 110004, Liaoning Province, China

Veysel Tahan, MD, Associate Professor, Department of Internal Medicine, Division of Gastroenterology and Hepatology, University of Missouri, Columbia, Missouri 65212, United States

Akihiro Tamori, MD, PhD, Professor, Department of Hepatology, Osaka City University Graduate School of Medicine, Osaka 5458585, Japan

Kok Yang Tan, Associate Professor, Department of Surgery, Khoo Teck Puat Hospital, Singapore 768828, Singapore

Yasuhito Tanaka, MD, PhD, Professor, Department of Gastroenterology and Hepatology, Faculty of Life Sciences, Kumamoto University, Kumamoto 860-0862, Japan

Naoki Tanaka, MD, PhD, Professor, Department of Global Medical Research Promotion, Shinshu University School of Medicine, Matsumoto, Nagano 390-8621, Japan

Giovanni Tarantino, MD, Professor, Senior Researcher, Department of Clinical Medicine and Surgery, Federico II University Medical School, Naples 80131, Italy

Oscar Tatsuya Teramoto-Matsubara, MD, Department of Gastroenterology and Endoscopy, ABC Medical Center, Mexico City 11000, Mexico

Ragesh Babu Thandassery, MD, Assistant Professor, Department of Medicine, Central Arkansas Veterans Healthcare Systen, Little Rock, AR 72205, United States

Konstantinos Thomopoulos, MD, Professor, Division of Gastroenterology, Department of Internal Medicine, University Hospital of Patras, Patras 26504, Greece

Guido Alberto Massimo Tiberio, MD, Professor, Surgical Clinic, Department of Clinical and Experimental Sciences, University of Brescia, Brescia 25100, Italy

Minoru Tomizawa, MD, PhD, Department of Gastroenterology, National Hospital Organization Shimoshizu Hospital, Yotsukaido City, Chiba 284-0003, Japan

Maria Lina Tornesello, PhD, Department of Research, Istituto Nazionale Tumori IRCCS Fond Pascale, Napoli 80131, Italy

Ervin Toth, MD, PhD, Endoscopy Unit, Department of Gastroenterology, Skåne University Hospital, Malmo 20502, Sweden

David Tougeron, MD, PhD, Full Professor, Department of Gastroenterology, Poitiers University Hospital, Poitiers 86000, France

Cristiane Valle Tovo, MD, PhD, Associate Professor, Department of Gastroenterology and Hepatology, Universidade Federal de Ciências da Saúde de Porto Alegre, Porto Alegre, RS 90050-170, Brazil

Osamu Toyoshima, MD, PhD, Professor, Department of Gastroenterology, Toyoshima Endoscopy Clinic, Tokyo 157-0066, Japan

Sombat Treeprasertsuk, MD, PhD, Professor, Department of Medicine, Division of Gastroenterology, Faculty of Medicine, Chulalongkorn University, and Thai Red Cross, Bangkok 10330, Thailand

John K Triantafillidis, MD, PhD, Associate Professor, Inflammatory Bowel Disease Unit, "Metropolitan General" Hospital, Holargos "Mediterraneo First Care" Glyfada, Holargos, Attica 15562, Greece

Konstantinos Triantafyllou, MD, PhD, Professor, Hepatogastroenterology Unit, Second Department of Internal Medicine – Propaedeutic, Medical School, National and Kapodistrian University of Athens, "Attikon" University General Hospital, Athens 12462, Greece

Anca Trifan, MD, Professor, Department of Gastroenterology and Internal Medicine, "Grigore T. Popa" University of Medicine and Pharmacy, "St. Spiridon" University Hospital, Institute of Gastroenterology and Hepatology, Iasi 700111, Romania

Dhiraj Tripathi, MD, Professor, Liver Unit, Queen Elizabeth Hospital, Birmingham B15 2TH, United Kingdom

Maria Fernanda Troncoso, PhD, Assistant Professor, Department of Biological Chemistry and Institute of Biochemistry and Biophysics, School of Pharmacy and Biochemistry, University of Buenos Aires and National Research Council of Argentina, Buenos Aires C1113AAD, Argentina

Apostolos Tsolakis, MD, PhD, Department of Oncology and Pathology, Karolinska Institutet, Stockholm 171 76, Sweden

Georgios Tsoulfas, MD, PhD, Professor, Department of Transplant Surgery, Aristotle University of Thessaloniki School of Medicine, Thessaloniki 54124, Greece

Yosuke Tsuji, MD, PhD, Assistant Professor, Department of Gastroenterology, Graduate School of Medicine, The University of Tokyo, Tokyo 113-8655, Japan

Hong Tu, MD, PhD, Professor, State Key Laboratory of Oncogenes and Related Genes, Shanghai Cancer Institute, Renji Hospital, Shanghai Jiao-Tong University School of Medicine, Shanghai 200032, China

Zsolt Tulassay, MD, Molecular Medicine Research Group, Hungarian Academy of Sciences, Budapest 1088, Hungary

Gokhan Tumgor, MD, PhD, Professor, Pediatric Gastroenterology, Cukurova University Medical Faculty, Adana 01380, Türkiye

Balasubramaniyan Vairappan, PhD, Professor, Liver Diseases Research Lab, Department of Biochemistry, Jawaharlal Institute of Postgraduate Medical Education and Research, Puducherry 605006, India

Abhinav Vasudevan, PhD, Adjunct Associate Professor, Department of Gastroenterology and Hepatology, Eastern Health, Box Hill 3128, Australia

Gilberto Vaughan, PhD, Division of Viral Hepatitis, Centers for Disease Control and Prevention, Atlanta, GA 30329, United States

Umberto Vespasiani-Gentilucci, PhD, Full Professor, Department of Internal Medicine, Università Campus Bio-Medico of Rome, Head of the Unit of Autoimmune and Metabolic Liver Diseases, Fondazione Policlinico Campus Bio-Medico of Rome, Rome 00128, Italy

Silvia Vidal, PhD, Assistant Professor, Immunology, Institut Investigacions Biomediques-Institut Recerca Hospital Sant Pau, Barcelona 08025, Spain

Yirupaiahgar K S Viswanath, Professor, Department of Upper GI Surgery Endoscopy and Laparoscopic Surgery, James Cook University Hospital, Middlesbrough, Cleveland TS4 3BW, United Kingdom

Marco Vivarelli, MD, Professor, Department of Experimental and Clinical Medicine, Polytechnic University of Marche, Hepatobiliary, Pancreatic and Abdominal Transplantation Surgery, Ospedali Riuniti delle Marche, via Conca 71, Ancona 60126, Italy

Tamara Vorobjova, MD, PhD, Associate Professor, Department of Immunology, Institute of Biomedicine and Translational Medicine, University of Tartu, Tartu 51014, Estonia

Yu-Gang Wang, MD, Professor, Department of Gastroenterology, Tongren Hospital, Shanghai Jiao Tong University School of Medicine, Shanghai 200336, China

Yuan-Hung Wang, PhD, Associate Professor, Graduate Institute of Clinical Medicine, Taipei Medical University, Taipei 110, Taiwan

Nir Wasserberg, MD, Associate Professor, Professor, Department of Surgery, Rabin Medical Center, Petach Tiqwa 49100, Israel

David I Watson, MD, PhD, Professor, Flinders University Discipline of Surgery, Flinders University, Flinders Medical Centre, Adelaide, South Australia 5042, Australia

Charles Melbern Wilcox, MD, Professor, Medicine, Division of Gastroenterology and Hepatology, University of Alabama at Birmingham, Birmingham, AL 35294, United States

Tibor Wittmann, MD, PhD, Professor, First Department of Medicine, University of Szeged, Szeged H-6720, Hungary

Qi Xie, MD, PhD, Professor, Department of Medical Imaging, Nansha Hospital, Guangzhou First People's Hospital, School of Medicine, South China University of Technology, Guangzhou 511457, Guangdong Province, China

Cheng-Fu Xu, MD, Chief Physician, Professor, Department of Gastroenterology, The First Affiliated Hospital, Zhejiang University School of Medicine, Hangzhou 310003, Zhejiang Province, China

Feng Yang, MD, PhD, Associate Professor, Department of Pancreatic Surgery, Huashan Hospital, Shanghai Medical College, Fudan University, Shanghai 200040, China

Tzung-Hai Yen, MD, PhD, Professor, Department of Nephrology, Chang Gung Memorial Hospital, No. 5 Fu-Hsing Street, Kweishan, Taoyuan City 333, Taiwan

Desmond Yip, MD, Professor, Department of Medical Oncology, The Canberra Hospital, Garran, ACT 2606, Australia

Michele Yip-Schneider, PhD, Professor, Department of Surgery, Indiana University School of Medicine, Indianapolis, IN 46202, United States

Kentaro Yoshioka, MD, PhD, Center for Liver Diseases, Meijo Hospital, Nagoya, Aichi 460-0001, Japan

Yan-Bo Yu, MD, Professor, Department of Gastroenterology, Laboratory of Translational Gastroenterology, Qilu Hospital, Shandong University, Jinan 250012, Shandong Province, China

Chao-Hui Yu, MD, PhD, Professor, The First Affiliated Hospital, College of Medicine, Zhejiang University, Hangzhou 310003, Zhejiang Province, China

Ilhami Yuksel, MD, Professor, Department of Gastroenterology, Ankara Bilkent City Hospital, Ankara 06800, Türkiye; Department of Gastroenterology, Ankara Yildirim Beyazit University, School of Medicine, Ankara 06300, Türkiye

Cyrla Zaltman, MD, PhD, Associate Professor, Department of Internal Medicine, Federal University of Rio de Janeiro, Rio de Janeiro 21941-913, Brazil

Li Zhang, MD, PhD, School of Biotechnology and Biomolecular Sciences, University of New South Wales, Sydney, NSW 2052, Australia

Ce-Fan Zhou, PhD, Professor, School of Life and Health Sciences, Institute of Biomedical Research, National "111" Center for Cellular Regulation and Molecular Pharmaceutics, Key Laboratory of Fermentation Engineering (Ministry of Education), Hubei University of Technology, Wuhan 430068, Hubei Province, China

Demosthenes E Ziogas, MD, PhD, Assistant Professor, Department of Surgery, University of Ioannina, Ioannina GR 45110, Greece

World Journal of Gastroenterology

Contents

Weekly Volume 32 Number 39 October 21, 2026

EDITORIAL

Chang FC, Tsai CY, Koh KJ, Huang CS. New insights into the pathogenic variation landscape in pediatric gastroenterology diseases. *World J Gastroenterol* 2026; 32(39): 120428 [DOI: 10.3748/wjg.120428]

Krishnan A. Imaging tumor heterogeneity to predict response to transarterial chemoembolization in hepatocellular carcinoma. *World J Gastroenterol* 2026; 32(39): 120606 [DOI: 10.3748/wjg.120606]

OPINION REVIEW

Dous C. Diagnostic accuracy in early gastric cancer: Is endoscopic ultrasound staging still reliable? *World J Gastroenterol* 2026; 32(39): 119757 [DOI: 10.3748/wjg.119757]

Maurya DK, Sharma P. Berberine as a dual-target therapeutic for ulcerative colitis. *World J Gastroenterol* 2026; 32(39): 119800 [DOI: 10.3748/wjg.119800]

MINIREVIEWS

Saleh A, Yessin A, Salva W, Batarseh M, El Khoury M, Nehme F. Endoscopic ultrasound-guided gastrointestinal anastomosis: Evolving applications in advanced therapeutic endoscopy. *World J Gastroenterol* 2026; 32(39): 120546 [DOI: 10.3748/wjg.120546]

ORIGINAL ARTICLE

Retrospective Cohort Study

Kim DY, Jeong J, Hong JP, Lee JS, Kim MN, Kim BK, Kim SU, Park JY, Ahn SH, Kim DY, Lee HW. Resolved hepatitis B is associated with higher reactivation risk than chronic infection after chemoembolization for hepatocellular carcinoma. *World J Gastroenterol* 2026; 32(39): 120320 [DOI: 10.3748/wjg.120320]

Retrospective Study

Monti M, Ceredi B, Paganelli N, Vespignani R, Andalò A, De Angelis P, Gentili N, Massa I, Roncadori A, Danesi V, Balzi W. Alarm from the peritoneum: Gastrointestinal perforations in cancer patients, with a focus on perforations of unknown origin. *World J Gastroenterol* 2026; 32(39): 119719 [DOI: 10.3748/wjg.119719]

Observational Study

Zhang FY, Xu LM, Gao FY, Wang W, Lin WL, Zhang H, Wang KZ, Wang QJ, Jin AJ, Yang RP, Qu CY, Zhang Y, Li ZH, Wang D, Shi CC, Shen TB, Shen F, Hu Y, Shen F. Endoscopic score predicting recurrence after foam sclerotherapy in grade I internal hemorrhoids: Development and external validation. *World J Gastroenterol* 2026; 32(39): 121904 [DOI: 10.3748/wjg.121904]

Prospective Study

Yang GY, Zhang XF, Zhao X, Qu H, Zhou P, Wang Y, Tu SM, Xia ZY, Chu QJ. Postoperative nausea and vomiting after laparoscopic sleeve gastrectomy: A prospective cohort study. *World J Gastroenterol* 2026; 32(39): 120167 [DOI: 10.3748/wjg.120167]

World Journal of Gastroenterology

Weekly Volume 32 Number 39 October 21, 2026

Contents

Basic Study

Luo YZ, Zhao Q, Wang FF, Li JH, Lyu SC, Liu Z, Lang R, He Q. Androgen-induced gene 1 correlates with extracellular vesicle-associated cholesterol metabolism and hepatic metastasis of pancreatic cancer. *World J Gastroenterol* 2026; 32(39): 121007 [DOI: 10.3748/wjg.121007]

Sall T, Litvinova E, Arzhanova E, Sitkin S, Vakhitov T. Gut microbial metabolites as key mediators in inflammatory bowel disease. *World J Gastroenterol* 2026; 32(39): 121041 [DOI: 10.3748/wjg.121041]

META-ANALYSIS

Gong EJ, Bang CS, Lee JJ, Baik GH. Comparative efficacy and pharmacological heterogeneity of individual potassium-competitive acid blockers: A systematic review and network meta-analysis. *World J Gastroenterol* 2026; 32(39): 121372 [DOI: 10.3748/wjg.121372]

CORRESPONDENCE

Jimenez Jimenez E, Romero-Zoghbi SE, López-Campos F, Couñago F. Letter to the Editor: Beyond ypN status: Lymph node regression grade refines risk stratification in rectal cancer. *World J Gastroenterol* 2026; 32(39): 120225 [DOI: 10.3748/wjg.v32.i39.120225]

Polivanova TV, Kasparov EV, Vshivkov VA. Letter to the Editor: Chaihu-Shugan-San in the treatment of atrophic gastritis. *World J Gastroenterol* 2026; 32(39): 122644 [DOI: 10.3748/wjg.122644]

Garbuzenko DV. Letter to the Editor: Current approaches to the management of colonic variceal bleeding. *World J Gastroenterol* 2026; 32(39): 123238 [DOI: 10.3748/wjg.123238]

World Journal of Gastroenterology

Weekly Volume 32 Number 39 October 21, 2026

Contents

ABOUT COVER

Peer Review of *World Journal of Gastroenterology*, Wei-Jia Liao, Professor, Chief Physician, Laboratory of Hepatobiliary and Pancreatic Surgery, The First Affiliated Hospital of Guilin Medical University, No. 15 Lequn Road, Xiufeng District, Guilin 541001, Guangxi Zhuang Autonomous Region, China. liaoweijia288@163.com

AIMS AND SCOPE

World Journal of Gastroenterology is an international, peer-reviewed, open-access journal dedicated to advancing cutting-edge research and clinical practice across the full spectrum of gastroenterology and hepatology. The journal welcomes studies addressing diseases of the esophagus, stomach, small intestine, colon and rectum, pancreas, gallbladder, bile ducts, and liver. The journal publishes a diverse range of article types, including: Original clinical and basic research, translational studies, reviews and mini-reviews, editorials and correspondences, and case reports. We invite researchers, clinicians, and multidisciplinary experts worldwide to submit high-quality manuscripts and contribute to shaping the future of gastrointestinal science.

INDEXING/ABSTRACTING

The *WJG* is now abstracted and indexed in Science Citation Index Expanded (SCIE), Scopus, *Reference Citation Analysis*. The 2026 edition of Journal Citation Reports® cites the 2025 journal impact factor (JIF) for *WJG* as 7.7; Quartile: Q1. The *WJG*'s CiteScore for 2025 is 8.3.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: *Cai-Hong Wang*; **Production Department Director:** *Xiang Li*; **Cover Editor:** *Jia-Ru Fan.*

NAME OF JOURNAL
World Journal of Gastroenterology

ISSN
ISSN 1007-9327 (print) ISSN 2219-2840 (online)

LAUNCH DATE
October 1, 1995

FREQUENCY
Weekly

EDITORS-IN-CHIEF
Andrzej S Tarnawski

EDITORIAL BOARD MEMBERS
http://www.wjgnet.com/1007-9327/editorialboard.htm

PUBLICATION DATE
October 21, 2026

COPYRIGHT
© 2026 Baishideng Publishing Group Inc

GUIDELINES FOR AUTHORS
https://www.wjgnet.com/bpg/gerinfo/204

EDITORIAL POLICIES
https://www.wjgnet.com/bpg/gerInfo/285

EDITORIAL PROCESS
https://www.wjgnet.com/bpg/gerInfo/316

PEER-REVIEW PROCESS
https://www.wjgnet.com/bpg/gerinfo/241

ETHICS STATEMENTS OF HUMAN
https://www.wjgnet.com/bpg/gerinfo/238

PUBLICATION ETHICS
https://www.wjgnet.com/bpg/gerinfo/288

ARTICLE PROCESSING CHARGE
https://www.wjgnet.com/bpg/gerinfo/242

SUBMIT A MANUSCRIPT
https://www.f6publishing.com

Published by Baishideng Publishing Group Inc. 7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-3991568 **E-mail:** office@baishideng.com https://www.wjgnet.com

World Journal of Gastroenterology

Submit a Manuscript: https://www.f6publishing.com

World J Gastroenterol 2026 October 21; 32(39): 119757

DOI: 10.3748/wjg.119757

ISSN 1007-9327 (print) ISSN 2219-2840 (online)

OPINION REVIEW

Diagnostic accuracy in early gastric cancer: Is endoscopic ultrasound staging still reliable?

Chahrazed Dous

Peer review: Externally peer reviewed.
Peer-review model: Single blind
Peer-review report's classification
Scientific quality: Grade B, Grade C
Novelty: Grade B, Grade C
Creativity or innovation: Grade B, Grade C
Scientific significance: Grade B, Grade C
P-Reviewer: Duan S, Professor, China; Zhang J, Director, PhD, United States
Received: February 5, 2026
Revised: March 6, 2026
Accepted: April 16, 2026
Published online: October 21, 2026
Processing time: 217 Days and 15 Hours
Copyright: ©Author(s) 2026. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution-NonCommercial (CC BY-NC 4.0) license. No commercial re-use. See permissions. **Published by** Baishideng Publishing Group Inc.

Chahrazed Dous, Department of General Surgery, Public Hospital of Theniet El Abed, Batna 5011, Algeria

ORCID number: Chahrazed Dous 0009-0002-5666-5645.

Corresponding author: Chahrazed Dous, MD, Department of General Surgery, Public Hospital of Theniet El Abed, Daïra of Theniet EL Abed, Batna 5011, Algeria.
douschahrazed@yahoo.com

Abstract

Pretreatment assessment of early gastric cancer using endoscopic ultrasound (EUS) is a critical step in selecting the most appropriate treatment for each patient based on the T stage. However, the diagnostic accuracy of EUS for Tis/T1a lesions may be influenced by clinicopathological factors. A recent retrospective study by Qiao *et al*, including a total of 209 patients, demonstrated that younger age and the presence of ulceration were significantly associated with overstaging of Tis/T1a lesions. In the presence of gastric ulceration, the sensitivity of EUS was markedly reduced, reaching only 41.25%. From a therapeutic perspective, reduced accuracy in pre-treatment staging can have important clinical implications. Overestimation of tumor stage in T1a disease may expose patients to unwarranted surgical proce-dures, while underestimation of T1b tumors may lead to insufficient treatment and an increased risk of recurrence. These findings highlight the need for cautious interpretation of EUS results in this patient population and emphasize the importance of a more comprehensive diagnostic strategy. This article examines these findings from a global perspective and discusses alternative diagnostic approaches.

Key Words: Early gastric cancer; Endoscopic ultrasonography; Invasion depth; Accuracy; Artificial intelligence; Conventional endoscopy

Core Tip: The choice between endoscopic and surgical treatment in early gastric cancer is based on accurate determination of the depth of tumor invasion. Endoscopic ultrasound has long been considered the most useful tool for this purpose when compared with conventional endoscopy and imaging modalities. However, the accuracy of endoscopic ultrasound in distinguishing between mucosal and submucosal invasion is variable and is influenced by multiple clinicopathological factors. The aim of this article is to discuss this concern and to review other effective diagnostic approaches for assessing invasion depth in early gastric cancer.

Citation: Dous C. Diagnostic accuracy in early gastric cancer: Is endoscopic ultrasound staging still reliable? *World J Gastroenterol* 2026; 32(39): 119757
URL: https://www.wjgnet.com/1007-9327/full/v32/i39/119757.htm
DOI: https://dx.doi.org/10.3748/wjg.119757

INTRODUCTION

Gastric cancer ranks as the fifth most common cancer worldwide in terms of both incidence and mortality rate. The highest incidence rates of this type of cancer are observed in Eastern Asia and Eastern Europe[1]. Gastric carcinoma represents a significant global health challenge, particularly due to its high aggressiveness and heterogeneity[2]. It is often diagnosed at a later stage, as the disease is usually asymptomatic in its initial phases[3]. Management strategies include surgery, endoscopic resection, and chemotherapy, depending on the stage of the disease[4]. Chemotherapy, with or without surgery, is the primary treatment approach for stage III-IV gastric cancer, while surgery is the main first-line treatment for stage I-II disease[5]. Endoscopic resection is indicated in selected cases of early gastric cancer (EGC)[6].

The concept of EGC was first proposed in 1971 by the Japanese Society of Gastroenterology and Endoscopy, originally describing a gastric neoplasm amenable to curative surgical treatment. Currently, EGC is defined more precisely as a gastric adenocarcinoma confined to the mucosa or submucosa, regardless of lymph node involvement[7]. This corresponds to T1a and T1b invasion according to the American Joint Committee on Cancer's 8th tumor-node-metastasis classification (Figure 1)[8]. Conversely, advanced gastric carcinoma is defined as a gastric carcinoma that invades the muscularis propria[9]. Furthermore, by implementing biennial upper gastrointestinal endoscopy for individuals over 40 years of age, the Korean National Cancer Screening Program has increased the detection rate of EGC to approximately 70%[10].

Endoscopic interventions constitute the first-line treatment for EGC, including endoscopic mucosal resection and endoscopic submucosal dissection[11]. In Japan, endoscopic resection represents over 60% of treatment modalities for EGC[12]. However, their indications are based on the risk of lymph node metastasis and the feasibility of *en bloc* resection [13], which makes careful assessment and selection of suitable patients a critical step in management. Accurate prediction of the depth of tumor invasion is essential[14]. Standard indications for endoscopic resection across all major guidelines [Korean (2024), Japanese (2021), and European (2025)] include differentiated intramucosal carcinoma without ulceration, regardless of tumor size (with Korean guidelines specifying a size ≤ 2 cm), or with ulceration ≤ 3 cm, which are considered absolute indications for endoscopic submucosal dissection[15-17]. Additionally, submucosal lesions limited to the superficial submucosal invasion (≤ 500 μm) category may be considered for endoscopic resection, with additional conditions in the Korean guidelines, including a critical pathological review[18].

Endoscopic ultrasonography has long been considered a key diagnostic tool for superficial gastrointestinal neoplasms with suspicious features[19]. The overall accuracy of T staging in EGC has been reported to range from approximately 65% to 92.1%[20]. Compared to endoscopic ultrasound (EUS), conventional endoscopy plays a central role in the detection and characterization of gastric cancer lesions, providing direct visualization of mucosal abnormalities[21,22]. However, it may lead to understaging of lesions with submucosal invasion[23]. Computed tomography is more effective in detecting deeper tumor invasion and advanced gastric lesions while also providing a comprehensive assessment of disease extent[24,25]. Despite some recent studies showing improved T and N staging accuracy of multidetector computed tomography imaging, approaching that of EUS[26,27], the differentiation between mucosal and submucosal lesions still depends on EUS, which provides more detailed visualization of the five-layer structure of the gastric wall than CT scans[28,29]. Magnetic resonance imaging also plays an important role in preoperative staging[30,31], with reported accuracy rates of 93% for T3-T4 tumors and 91% for T1-T2 tumors, as well as 86% for N0 disease and 67% for N-positive disease, which highlights its value in the staging of advanced gastric cancer[32].

However, the diagnostic accuracy of EUS has recently been questioned, as several studies have reported lower performance in distinguishing T1a from T1b tumors and in assessing lymph node status[33,34]. A recent study by Qiao *et al*[35], suggested that factors such as younger age ($P = 0.035$) and the presence of ulceration ($P < 0.001$) were significantly associated with overstaging of Tis/T1a lesions. Notably, the presence of gastric ulceration remained the only independent predictor of overstaging, with an odds ratio of 15.25 [95% confidence interval (CI): 3.23-71.98; $P < 0.001$]. These results may be explained by the distortion of the normal gastric wall architecture induced by intense inflammation in active ulcers, which makes it difficult to distinguish inflammatory fibrosis from true submucosal tumor invasion[35,36]. Another study[37] identified histopathologic differentiation, along with tumor size and location, as determining factors for accuracy. Understaging was associated with poorly differentiated histology, whereas overstaging was associated with lesions larger than 3 cm located in the middle third of the stomach.

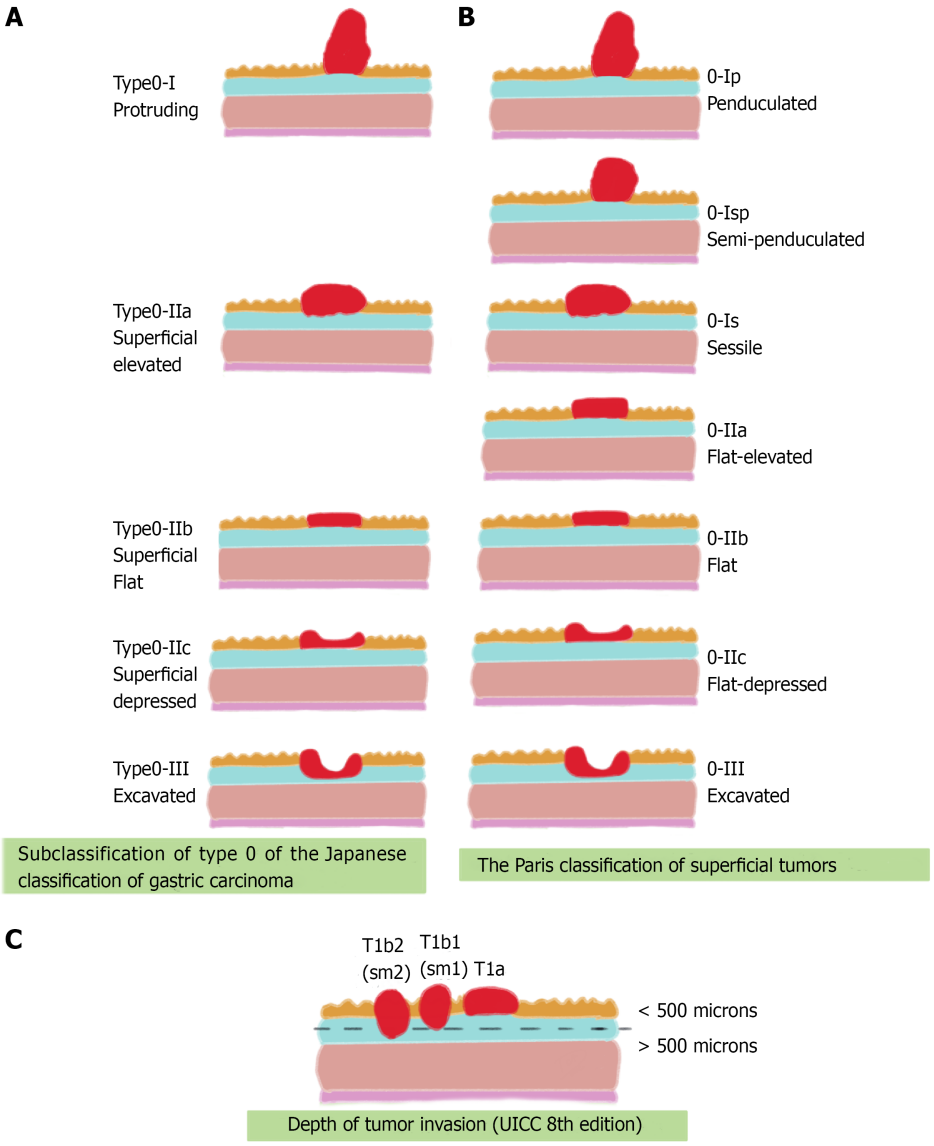

Figure 1 Classification of early gastric cancer. A: Japanese macroscopic classification of early gastric cancer: 3rd English edition[61]; B: International Endoscopic Paris Classification[62]; C: Depth of tumor invasion in gastric cancer according to Union for International Cancer Control/American Joint Committee on Cancer 8th edition tumor-node-metastasis classification[8]. UICC: Union for International Cancer Control.

These heterogeneous findings raise multiple concerns and highlight the need for further studies and improved techniques to enhance the pretherapeutic assessment of EGC and ultimately improve survival.

This article synthesizes the findings of Qiao *et al*[35] with selected contemporary studies addressing diagnostic accuracy in EGC. Relevant literature was reviewed to contextualize the performance of EUS, identify influencing factors, and focus on EUS as a diagnostic technique, including its various modalities and potential future enhancements.

EUS MODALITIES AND THEIR DIAGNOSTIC PERFORMANCE

In the recent study by Qiao *et al*[35], EUS examinations were conducted by experienced endoscopists using radial ultrasound probes operating at frequencies of 5-12 MHz (Olympus EU-ME2, Tokyo, Japan; Fujifilm SU-9000, Tokyo, Japan). Consequently, the study's findings reflect the diagnostic performance of this specific type of EUS. At present, three primary EUS methods are employed for staging EGC: Linear EUS, radial EUS, and miniprobe EUS[38,39].

To clarify the differences between these technologies, radial EUS provides a 360-degree cross-sectional image in a plane perpendicular to the axis of the endoscope, resembling computed tomography imaging[40,41]. In contrast, linear EUS generates a localized oblique image parallel to the endoscope, allowing real-time ultrasound-guided therapeutic interventions, such as EUS-guided Fine Needle Aspiration, EUS-guided injection therapies, and EUS-guided drainage procedures[42]. Additionally, high-frequency EUS miniprobes can be introduced through the standard biopsy channel of a conventional endoscope and are particularly useful in cases where luminal strictures prevent the passage of a standard EUS scope[43,44]. This raises the question of whether diagnostic accuracy for determining submucosal invasion differs

among these techniques.

Several comparative studies in the literature have addressed this issue. Lan *et al*[45] conducted a prospective cohort study comparing the diagnostic accuracy of linear EUS and radial EUS in patients with suspected EGC. The results demonstrated that linear EUS had a significantly higher diagnostic accuracy for determining submucosal invasion than radial EUS (90.9% *vs* 69.2%, $P = 0.024$).

Moreover, a recent single-center retrospective study[38] including 105 patients compared linear EUS with miniprobe EUS and found that linear EUS demonstrated higher accuracy in diagnosing suspected submucosal invasion in EGC. This difference was identified using binary regression analysis, as the analysis of variance of accuracy did not reach statistical significance. However, the same study[38] reported similar limitations, noting that overall accuracy was significantly reduced for lesions with ulcerations or diameters greater than 3 cm, which may lead to overestimation of invasion depth. Consequently, ulcerative lesions remain a common limitation across all three technologies.

Furthermore, multiple recent studies have focused on not only differentiating mucosal from submucosal invasion but also assessing the depth of submucosal invasion, given that endoscopic resection fulfilling the criteria for endoscopic curability A is regarded as curative for EGC, particularly in differentiated-type tumors with invasion limited to less than 500 μm from the muscularis mucosae (superficial submucosal invasion)[46].

As an example, Fujimoto *et al*[47] conducted a retrospective study evaluating the diagnostic performance and safety of gel-EUS, a technique that uses a transparent, colorless viscous gel approved in Japan in 2020 for endoscopic examination and treatment in place of water during EUS. The study assessed gel-EUS for detecting deep submucosal invasion in EGC and its role in guiding optimal treatment selection. The gel helps maintain gastric distension for a longer duration and provides a stable acoustic interface between the probe and the gastric wall. Gel-EUS demonstrated significantly higher sensitivity in detecting deep submucosal cancer (83.3%, 10/12 lesions; 95%CI: 0.51-0.97) compared with conventional EUS (25.0%, 2/8 lesions; 95%CI: 0.07-0.59).

In terms of image-enhanced EUS techniques, double contrast-enhanced ultrasonography has not demonstrated superiority in overall accuracy for preoperative T staging of gastric cancer[48]. Moreover, EUS appears to be superior to the double contrast-enhanced ultrasonography for the assessment of T1 stage tumors[49].

Nevertheless, since the accuracy of EUS heavily depends on the operator's skill and experience, inter-operator variability in diagnostic concordance may reach up to 25% due to differences in expertise[50]; consequently, the results remain heterogeneous and cannot be generalized. Therefore, it is important to conduct further studies on the integration and combination of advanced EUS technologies (Table 1) into clinical practice for the detection of EGC and the determination of the invasion depth.

THE FUTURE OF EUS: INTEGRATION OF ARTIFICIAL INTELLIGENCE

Since the accuracy of EUS closely depends on human performance and is subjectively assessed, this limitation can be addressed in the era of artificial intelligence (AI) through the development of trained models and computer-aided diagnostic systems[51]. Learning EUS requires significant time and hands-on practice in a high-volume center, guided by an experienced endosonographer, along with a strong understanding of ultrasound anatomy[52,53]. Accordingly, EUS combined with AI can not only enhance diagnostic accuracy but also support the training of beginners and help standardize performance between trainees and expert endosonographers[52].

Moreover, in terms of EGC diagnosis, Uema *et al*[54] developed an AI-based endoscopic ultrasonography system to assess the invasion depth of EGC. The study used a total of 8280 EUS images from 559 EGC cases collected across 11 institutions. The AI model's performance was evaluated using both internal and external validation datasets, demonstrating diagnostic accuracy comparable to that of expert endoscopists, with sensitivity, specificity, and accuracy of 66.3%, 88.7%, and 90.4%, respectively. These results represent early efforts in applying AI to EUS for assessing the invasion depth of EGC, as the majority of the current literature has focused on AI-assisted conventional endoscopy[55-57].

According to the meta-analysis of AI-assisted EGC diagnosis using endoscopic images (white-light imaging/narrow-band imaging) by Luo *et al*[58], seventeen studies reported the diagnostic performance of AI in detecting EGC from endoscopic images. However, all previous studies relied on static endoscopic images to train AI models for the detection and diagnosis of EGC. To address this limitation, Kim *et al*[59] developed an AI model to estimate the depth of tumor invasion in EGC using endoscopic videos. They compared two convolutional neural network models: One trained on static endoscopic images (image classifier) and the other trained on endoscopic videos (video classifier). The results showed that, when applied to video clips, the image classifier achieved a sensitivity of 33.6%, specificity of 85.5%, and accuracy of 56.6%. In contrast, the video classifier demonstrated superior performance, with a sensitivity of 82.3%, specificity of 85.8%, and accuracy of 83.7%. These findings and emerging trends raise the question of whether advances in AI integrated with conventional endoscopy could potentially reduce or modify the role of EUS in the future.

Nonetheless, AI assisted diagnosis of EGC faces several limitations. Most current studies are retrospective and often rely on small or insufficiently validated datasets. Retrospective designs introduce selection bias, as training datasets typically include only high-quality images while excluding lower-quality images. Moreover, false-positive and false-negative rates remain relatively high, limiting the clinical reliability of current AI models[60].

Table 1 Advanced endoscopic ultrasound imaging techniques in the diagnosis of gastrointestinal tract lesions (non-exhaustive)

Technique	Definition
EUS elastography	A technique that evaluates the stiffness of tissues, performed in real time[63]
Contrast-enhanced EUS	Uses contrast agents smaller than red blood cells to highlight small vessels and venules, helping differentiate pathological lesions[63]
EUS image fusion	Image fusion of EUS with CT, MRI or PET (under development)[64]
3D EUS	Enable the reconstruction of 3D images of the GIT and adjacent organs[65]
Artificial intelligence-assisted EUS	Promising tool for improving the accuracy and efficiency of EUS[65]

EUS: Endoscopic ultrasound; GIT: Gastrointestinal tract; 3D: Three-dimensional; CT: Computed tomography; MRI: Magnetic resonance imaging; PET: Positron emission tomography.

CONCLUSION

Accurate assessment of invasion depth in EGC is essential for guiding optimal treatment, especially in cases of clinical T1 lesions, in which endoscopic resection may be feasible. While EUS demonstrates high accuracy in advanced disease, its reliability in EGC is variable and highly operator dependent. The integration of AI with conventional endoscopy shows promise in improving diagnostic accuracy, yet studies on AI-assisted EUS remain limited. Further validation of AI models is required to improve the assessment of invasion depth in EGC using both conventional endoscopy and EUS, as well as their combination with other imaging modalities to enhance accuracy in differentiating between mucosal and submucosal invasion and in determining the precise depth of submucosal infiltration.

REFERENCES

1 **Bray F**, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, Jemal A. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer J Clin* 2024; **74**: 229-263 [*RCA*] [PMID: 38572751 DOI: 10.3322/caac.21834] [FullText]

2 **Ilic M**, Ilic I. Epidemiology of stomach cancer. *World J Gastroenterol* 2022; **28**: 1187-1203 [*RCA*] [PMID: 35431510 DOI: 10.3748/wjg.v28.i12.1187] [FullText] [Full Text(PDF)]

3 **Xia JY**, Aadam AA. Advances in screening and detection of gastric cancer. *J Surg Oncol* 2022; **125**: 1104-1109 [*RCA*] [PMID: 35481909 DOI: 10.1002/jso.26844] [FullText] [Full Text(PDF)]

4 **Machlowska J**, Baj J, Sitarz M, Maciejewski R, Sitarz R. Gastric Cancer: Epidemiology, Risk Factors, Classification, Genomic Characteristics and Treatment Strategies. *Int J Mol Sci* 2020; **21**: 4012 [*RCA*] [PMID: 32512697 DOI: 10.3390/ijms21114012] [FullText] [Full Text(PDF)]

5 **Taniguchi K**, Ota M, Yamada T, Serizawa A, Noguchi T, Amano K, Kotake S, Ito S, Ikari N, Omori A, Yamamoto M. Staging of gastric cancer with the Clinical Stage Prediction score. *World J Surg Oncol* 2019; **17**: 47 [*RCA*] [PMID: 30849974 DOI: 10.1186/s12957-019-1589-5] [FullText] [Full Text(PDF)]

6 **Chiarello MM**, Fico V, Pepe G, Tropeano G, Adams NJ, Altieri G, Brisinda G. Early gastric cancer: A challenge in Western countries. *World J Gastroenterol* 2022; **28**: 693-703 [*RCA*] [PMID: 35317273 DOI: 10.3748/wjg.v28.i7.693] [FullText] [Full Text(PDF)]

7 **Saragoni L**. Upgrading the definition of early gastric cancer: better staging means more appropriate treatment. *Cancer Biol Med* 2015; **12**: 355-361 [*RCA*] [PMID: 26779372 DOI: 10.7497/j.issn.2095-3941.2015.0054] [FullText] [Full Text(PDF)]

8 **López Sala P**, Leturia Etxeberria M, Inchausti Iguiñiz E, Astiazaran Rodríguez A, Aguirre Oteiza MI, Zubizarreta Etxaniz M. Gastric adenocarcinoma: A review of the TNM classification system and ways of spreading. *Radiologia (Engl Ed)* 2023; **65**: 66-80 [*RCA*] [PMID: 36842787 DOI: 10.1016/j.rxeng.2022.10.011] [FullText]

9 **Hu B**, El Hajj N, Sittler S, Lammert N, Barnes R, Meloni-Ehrig A. Gastric cancer: Classification, histology and application of molecular pathology. *J Gastrointest Oncol* 2012; **3**: 251-261 [*RCA*] [PMID: 22943016 DOI: 10.3978/j.issn.2078-6891.2012.021] [FullText] [Full Text (PDF)]

10 **Kim YG**, Kong SH, Oh SY, Lee KG, Suh YS, Yang JY, Choi J, Kim SG, Kim JS, Kim WH, Lee HJ, Yang HK. Effects of screening on gastric cancer management: comparative analysis of the results in 2006 and in 2011. *J Gastric Cancer* 2014; **14**: 129-134 [*RCA*] [PMID: 25061541 DOI: 10.5230/jgc.2014.14.2.129] [FullText] [Full Text(PDF)]

11 **Gotoda T**, Ono H. Stomach: Endoscopic resection for early gastric cancer. *Dig Endosc* 2022; **34** Suppl 2: 58-60 [*RCA*] [PMID: 34719805 DOI: 10.1111/den.14167] [FullText]

12 **Ono H**. [The history, present status and future perspective of ESD for GI tract cancer]. *Nihon Shokakibyo Gakkai Zasshi* 2017; **114**: 971-977 [*RCA*] [PMID: 28579590 DOI: 10.11405/nisshoshi.114.971] [FullText]

13 **Conti CB**, Agnesi S, Scaravaglio M, Masseria P, Dinelli ME, Oldani M, Uggeri F. Early Gastric Cancer: Update on Prevention, Diagnosis and Treatment. *Int J Environ Res Public Health* 2023; **20**: 2149 [*RCA*] [PMID: 36767516 DOI: 10.3390/ijerph20032149] [FullText] [Full Text (PDF)]

14 **Kim SJ**, Lim CH, Lee BI. Accuracy of Endoscopic Ultrasonography for Determining the Depth of Invasion in Early Gastric Cancer. *Turk J Gastroenterol* 2022; **33**: 785-792 [*RCA*] [PMID: 35946887 DOI: 10.5152/tjg.2022.21847] [FullText] [Full Text(PDF)]

15 **Kim IH**, Kang SJ, Choi W, Seo AN, Eom BW, Kang B, Kim BJ, Min BH, Tae CH, Choi CI, Lee CK, An HJ, Byun HK, Im HS, Kim HD, Cho JH, Pak K, Kim JJ, Bae JS, Yu JI, Lee JW, Choi J, Kim JH, Choi M, Jung MR, Seo N, Eom SS, Ahn S, Kim SJ, Lee SH, Lim SH, Kim TH,

Han HS; Development Working Group for the Korean Practice Guideline for Gastric Cancer 2024 Task Force Team. Korean Practice Guidelines for Gastric Cancer 2024: An Evidence-based, Multidisciplinary Approach (Update of 2022 Guideline). *J Gastric Cancer* 2025; **25**: 5-114 [*RCA*] [PMID: 39822170 DOI: 10.5230/jgc.2025.25.e11] [FullText] [Full Text(PDF)]

16 **Ono H**, Yao K, Fujishiro M, Oda I, Uedo N, Nimura S, Yahagi N, Iishi H, Oka M, Ajioka Y, Fujimoto K. Guidelines for endoscopic submucosal dissection and endoscopic mucosal resection for early gastric cancer (second edition). *Dig Endosc* 2021; **33**: 4-20 [*RCA*] [PMID: 33107115 DOI: 10.1111/den.13883] [FullText]

17 **Dinis-Ribeiro M**, Libânio D, Uchima H, Spaander MCW, Bornschein J, Matysiak-Budnik T, Tziatzios G, Santos-Antunes J, Areia M, Chapelle N, Esposito G, Fernandez-Esparrach G, Kunovsky L, Garrido M, Tacheci I, Link A, Marcos P, Marcos-Pinto R, Moreira L, Pereira AC, Pimentel-Nunes P, Romanczyk M, Fontes F, Hassan C, Bisschops R, Feakins R, Schulz C, Triantafyllou K, Carneiro F, Kuipers EJ. Management of epithelial precancerous conditions and early neoplasia of the stomach (MAPS III): European Society of Gastrointestinal Endoscopy (ESGE), European Helicobacter and Microbiota Study Group (EHMSG) and European Society of Pathology (ESP) Guideline update 2025. *Endoscopy* 2025; **57**: 504-554 [*RCA*] [PMID: 40112834 DOI: 10.1055/a-2529-5025] [FullText]

18 **Lee MW**. Endoscopic Submucosal Dissection for Early Gastric Cancer: Current Standard Indication and Management. *Korean J Helicobacter Up Gastrointest Res* 2026; **26**: 15-22 [*RCA*] [PMID: 41846441 DOI: 10.7704/kjhugr.2025.0087] [FullText] [Full Text(PDF)]

19 **Yasuda K**. EUS in the detection of early gastric cancer. *Gastrointest Endosc* 2002; **56**: S68-S75 [*RCA*] [PMID: 12297753 DOI: 10.1016/s0016-5107(02)70090-4] [FullText]

20 **Kwee RM**, Kwee TC. Imaging in local staging of gastric cancer: a systematic review. *J Clin Oncol* 2007; **25**: 2107-2116 [*RCA*] [PMID: 17513817 DOI: 10.1200/JCO.2006.09.5224] [FullText]

21 **Yao K**. The endoscopic diagnosis of early gastric cancer. *Ann Gastroenterol* 2013; **26**: 11-22 [*RCA*] [PMID: 24714327] [Full Text(PDF)]

22 **Choi J**, Kim SG, Im JP, Kim JS, Jung HC, Song IS. Endoscopic prediction of tumor invasion depth in early gastric cancer. *Gastrointest Endosc* 2011; **73**: 917-927 [*RCA*] [PMID: 21316050 DOI: 10.1016/j.gie.2010.11.053] [FullText]

23 **Yanai H**, Noguchi T, Mizumachi S, Tokiyama H, Nakamura H, Tada M, Okita K. A blind comparison of the effectiveness of endoscopic ultrasonography and endoscopy in staging early gastric cancer. *Gut* 1999; **44**: 361-365 [*RCA*] [PMID: 10026321 DOI: 10.1136/gut.44.3.361] [FullText]

24 **Woo SK**, Kim S, Kim TU, Lee JW, Kim GH, Choi KU, Jeon TY. Investigation of the association between CT detection of early gastric cancer and ultimate histology. *Clin Radiol* 2008; **63**: 1236-1244 [*RCA*] [PMID: 18929041 DOI: 10.1016/j.crad.2008.06.007] [FullText]

25 **Botet JF**, Lightdale CJ, Zauber AG, Gerdes H, Winawer SJ, Urmacher C, Brennan MF. Preoperative staging of gastric cancer: comparison of endoscopic US and dynamic CT. *Radiology* 1991; **181**: 426-432 [*RCA*] [PMID: 1924784 DOI: 10.1148/radiology.181.2.1924784] [FullText]

26 **Kumano S**, Murakami T, Kim T, Hori M, Iannaccone R, Nakata S, Onishi H, Osuga K, Tomoda K, Catalano C, Nakamura H. T staging of gastric cancer: role of multi-detector row CT. *Radiology* 2005; **237**: 961-966 [*RCA*] [PMID: 16251394 DOI: 10.1148/radiol.2373041380] [Full Text]

27 **Shimizu K**, Ito K, Matsunaga N, Shimizu A, Kawakami Y. Diagnosis of gastric cancer with MDCT using the water-filling method and multiplanar reconstruction: CT-histologic correlation. *AJR Am J Roentgenol* 2005; **185**: 1152-1158 [*RCA*] [PMID: 16247125 DOI: 10.2214/AJR.04.0651] [FullText]

28 **Mehmedović A**, Mesihović R, Saray A, Vanis N. Gastric cancer staging: EUS and CT. *Med Arch* 2014; **68**: 34-36 [*RCA*] [PMID: 24783909 DOI: 10.5455/medarh.2014.68.34-36] [FullText] [Full Text(PDF)]

29 **Yu JS**, Choi SH, Choi WH, Chung JJ, Kim JH, Kim KW. Value of nonvisualized primary lesions of gastric cancer on preoperative MDCT. *AJR Am J Roentgenol* 2007; **189**: W315-W319 [*RCA*] [PMID: 18029842 DOI: 10.2214/AJR.07.2672] [FullText]

30 **Méndez RJ**, Martín-Garre S. MRI for Local-Regional Staging of Gastric Cancer: A Promising Approach. *Radiology* 2024; **312**: e241384 [*RCA*] [PMID: 39012248 DOI: 10.1148/radiol.241384] [FullText]

31 **Borggreve AS**, Goense L, Brenkman HJF, Mook S, Meijer GJ, Wessels FJ, Verheij M, Jansen EPM, van Hillegersberg R, van Rossum PSN, Ruurda JP. Imaging strategies in the management of gastric cancer: current role and future potential of MRI. *Br J Radiol* 2019; **92**: 20181044 [*RCA*] [PMID: 30789792 DOI: 10.1259/bjr.20181044] [FullText] [Full Text(PDF)]

32 **Zhang Y**, Yu J. The role of MRI in the diagnosis and treatment of gastric cancer. *Diagn Interv Radiol* 2020; **26**: 176-182 [*RCA*] [PMID: 32209504 DOI: 10.5152/dir.2019.19375] [FullText] [Full Text(PDF)]

33 **Mocellin S**, Pasquali S. Diagnostic accuracy of endoscopic ultrasonography (EUS) for the preoperative locoregional staging of primary gastric cancer. *Cochrane Database Syst Rev* 2015; **2015**: CD009944 [*RCA*] [PMID: 25914908 DOI: 10.1002/14651858.CD009944.pub2] [FullText]

34 **Willis S**, Truong S, Gribnitz S, Fass J, Schumpelick V. Endoscopic ultrasonography in the preoperative staging of gastric cancer: accuracy and impact on surgical therapy. *Surg Endosc* 2000; **14**: 951-954 [*RCA*] [PMID: 11080410 DOI: 10.1007/s004640010040] [FullText]

35 **Qiao XY**, Li ZH, Lin SY, Wen G. Endoscopic ultrasound in early gastric cancer: Diagnostic accuracy and Tis/T1a lesion over staging risks. *World J Gastroenterol* 2026; **32**: 116463 [*RCA*] [PMID: 41694493 DOI: 10.3748/wjg.v32.i7.116463] [FullText] [Full Text(PDF)]

36 **Akashi K**, Yanai H, Nishikawa J, Satake M, Fukagawa Y, Okamoto T, Sakaida I. Ulcerous change decreases the accuracy of endoscopic ultrasonography diagnosis for the invasive depth of early gastric cancer. *Int J Gastrointest Cancer* 2006; **37**: 133-138 [*RCA*] [PMID: 18080789 DOI: 10.1007/s12029-007-9004-9] [FullText]

37 **Kim JH**, Song KS, Youn YH, Lee YC, Cheon JH, Song SY, Chung JB. Clinicopathologic factors influence accurate endosonographic assessment for early gastric cancer. *Gastrointest Endosc* 2007; **66**: 901-908 [*RCA*] [PMID: 17963876 DOI: 10.1016/j.gie.2007.06.012] [Full Text]

38 **Zhou J**, Wang Q, Li H, Zhang S, Tao L, Fang Q, Xu F, Liu J, Hu X. Comparison of diagnostic accuracy between linear EUS and miniprobe EUS for submucosal invasion in suspected cases of early gastric cancer. *Rev Esp Enferm Dig* 2022; **114**: 648-653 [*RCA*] [PMID: 35109659 DOI: 10.17235/reed.2022.8512/2021] [FullText]

39 **Papanikolaou IS**, Triantafyllou M, Triantafyllou K, Rösch T. EUS in the management of gastric cancer. *Ann Gastroenterol* 2011; **24**: 9-15 [*RCA*] [PMID: 24714299] [Full Text(PDF)]

40 **Matthes K**, Bounds BC, Collier K, Gutierrez A, Brugge WR. EUS staging of upper GI malignancies: results of a prospective randomized trial. *Gastrointest Endosc* 2006; **64**: 496-502 [*RCA*] [PMID: 16996338 DOI: 10.1016/j.gie.2006.01.023] [FullText]

41 **Dye CE**, Waxman I. Endoscopic ultrasound. *Gastroenterol Clin North Am* 2002; **31**: 863-879 [*RCA*] [PMID: 12481735 DOI: 10.1016/s0889-8553(02)00031-6] [FullText]

42 **Seewald S**, Ang TL, Soehendra N. Basic technique of handling the linear echoendoscope and how it differs from the radial echoendoscope. *Gastrointest Endosc* 2009; **69**: S78-S80 [*RCA*] [PMID: 19179176 DOI: 10.1016/j.gie.2008.12.005] [FullText]

43 **Reddy Y**, Willert RP. Endoscopic ultrasound: what is it and when should it be used? *Clin Med (Lond)* 2009; **9**: 539-543 [*RCA*] [PMID: 20095294 DOI: 10.7861/clinmedicine.9-6-539] [FullText] [Full Text(PDF)]

44 **Seifert H**, Fusaroli P, Arcidiacono PG, Braden B, Herth F, Hocke M, Larghi A, Napoleon B, Rimbas M, Ungureanu BS, Săftoiu A, Sahai AV, Dietrich CF. Controversies in EUS: Do we need miniprobes? *Endosc Ultrasound* 2021; **10**: 246-269 [*RCA*] [PMID: 34380805 DOI: 10.4103/EUS-D-20-00252] [FullText] [Full Text(PDF)]

45 **Lan Z**, Hu H, Mandip R, Zhu W, Guo W, Wen J, Xie F, Qiao W, Venkata A, Huang Y, Liu S, Li Y. Linear-array endoscopic ultrasound improves the accuracy of preoperative submucosal invasion prediction in suspected early gastric cancer compared with radial endoscopic ultrasound: A prospective cohort study. *J Gastroenterol Hepatol* 2020; **35**: 118-123 [*RCA*] [PMID: 31379013 DOI: 10.1111/jgh.14819] [Full Text]

46 **Japanese Gastric Cancer Association**. Japanese gastric cancer treatment guidelines 2025 (7th edition). *Gastric Cancer* 2026; **29**: 271-299 [*RCA*] [PMID: 41569370 DOI: 10.1007/s10120-025-01698-4] [FullText] [Full Text(PDF)]

47 **Fujimoto A**, Tanaka J, Sato N, Hara K, Suzuki K, Kobayashi H, Nishikawa Y, Ono M, Yamaguchi K, Toba T, Matsuda T. Improved diagnostic accuracy and safety of gel-endoscopic ultrasonography for deep submucosal invasion in early gastric cancer. *Surg Endosc* 2026; **40**: 965-973 [*RCA*] [PMID: 41171422 DOI: 10.1007/s00464-025-12335-7] [FullText]

48 **Zheng Z**, Yu Y, Lu M, Sun W, Wang F, Li P, Zhang Y, Lin L, Huang P, Chen J, Zhang H, Xie Z, Dong Xda E. Double contrast-enhanced ultrasonography for the preoperative evaluation of gastric cancer: a comparison to endoscopic ultrasonography with respect to histopathology. *Am J Surg* 2011; **202**: 605-611 [*RCA*] [PMID: 21824594 DOI: 10.1016/j.amjsurg.2010.09.033] [FullText]

49 **Wang L**, Liu Z, Kou H, He H, Zheng B, Zhou L, Yang Y. Double Contrast-Enhanced Ultrasonography in Preoperative T Staging of Gastric Cancer: A Comparison With Endoscopic Ultrasonography. *Front Oncol* 2019; **9**: 66 [*RCA*] [PMID: 30809510 DOI: 10.3389/fonc.2019.00066] [FullText] [Full Text(PDF)]

50 **Dong J**, Jiang X, Ding T, Wang X. Computed tomography vs. endoscopic ultrasonography for preoperative gastric cancer Staging: A meta-analysis. *J Radiat Res Appl Sci* 2025; **18**: 101855 [DOI: 10.1016/j.jrras.2025.101855] [FullText]

51 **Rizzatti G**, Tripodi G, De Lucia SS, Pellegrino A, Boskoski I, Larghi A, Spada C. Artificial intelligence system for EUS navigation and anatomical landmark recognition. *VideoGIE* 2025; **10**: 358-363 [*RCA*] [PMID: 40642404 DOI: 10.1016/j.vgie.2025.03.027] [FullText] [Full Text(PDF)]

52 **Khalaf K**, Terrin M, Jovani M, Rizkala T, Spadaccini M, Pawlak KM, Colombo M, Andreozzi M, Fugazza A, Facciorusso A, Grizzi F, Hassan C, Repici A, Carrara S. A Comprehensive Guide to Artificial Intelligence in Endoscopic Ultrasound. *J Clin Med* 2023; **12**: 3757 [*RCA*] [PMID: 37297953 DOI: 10.3390/jcm12113757] [FullText] [Full Text(PDF)]

53 **Kim GH**, Bang SJ, Hwang JH. Learning models for endoscopic ultrasonography in gastrointestinal endoscopy. *World J Gastroenterol* 2015; **21**: 5176-5182 [*RCA*] [PMID: 25954091 DOI: 10.3748/wjg.v21.i17.5176] [FullText] [Full Text(PDF)]

54 **Uema R**, Hayashi Y, Kizu T, Igura T, Ogiyama H, Yamada T, Takeda R, Nagai K, Inoue T, Yamamoto M, Yamaguchi S, Kanesaka T, Yoshihara T, Kato M, Yoshii S, Tsujii Y, Shinzaki S, Takehara T. A novel artificial intelligence-based endoscopic ultrasonography diagnostic system for diagnosing the invasion depth of early gastric cancer. *J Gastroenterol* 2024; **59**: 543-555 [*RCA*] [PMID: 38713263 DOI: 10.1007/s00535-024-02102-1] [FullText] [Full Text(PDF)]

55 **Zhu Y**, Wang QC, Xu MD, Zhang Z, Cheng J, Zhong YS, Zhang YQ, Chen WF, Yao LQ, Zhou PH, Li QL. Application of convolutional neural network in the diagnosis of the invasion depth of gastric cancer based on conventional endoscopy. *Gastrointest Endosc* 2019; **89**: 806-815.e1 [*RCA*] [PMID: 30452913 DOI: 10.1016/j.gie.2018.11.011] [FullText]

56 **Nagao S**, Tsuji Y, Sakaguchi Y, Takahashi Y, Minatsuki C, Niimi K, Yamashita H, Yamamichi N, Seto Y, Tada T, Koike K. Highly accurate artificial intelligence systems to predict the invasion depth of gastric cancer: efficacy of conventional white-light imaging, nonmagnifying narrow-band imaging, and indigo-carmine dye contrast imaging. *Gastrointest Endosc* 2020; **92**: 866-873.e1 [*RCA*] [PMID: 32592776 DOI: 10.1016/j.gie.2020.06.047] [FullText]

57 **Namikawa K**, Hirasawa T, Yoshio T, Fujisaki J, Ozawa T, Ishihara S, Aoki T, Yamada A, Koike K, Suzuki H, Tada T. Utilizing artificial intelligence in endoscopy: a clinician's guide. *Expert Rev Gastroenterol Hepatol* 2020; **14**: 689-706 [*RCA*] [PMID: 32500760 DOI: 10.1080/17474124.2020.1779058] [FullText]

58 **Luo D**, Kuang F, Du J, Zhou M, Liu X, Luo X, Tang Y, Li B, Su S. Artificial Intelligence-Assisted Endoscopic Diagnosis of Early Upper Gastrointestinal Cancer: A Systematic Review and Meta-Analysis. *Front Oncol* 2022; **12**: 855175 [*RCA*] [PMID: 35756602 DOI: 10.3389/fonc.2022.855175] [FullText] [Full Text(PDF)]

59 **Kim JH**, Oh SI, Han SY, Keum JS, Kim KN, Chun JY, Youn YH, Park H. An Optimal Artificial Intelligence System for Real-Time Endoscopic Prediction of Invasion Depth in Early Gastric Cancer. *Cancers (Basel)* 2022; **14**: 6000 [*RCA*] [PMID: 36497481 DOI: 10.3390/cancers14236000] [FullText] [Full Text(PDF)]

60 **Lei C**, Sun W, Wang K, Weng R, Kan X, Li R. Artificial intelligence-assisted diagnosis of early gastric cancer: present practice and future prospects. *Ann Med* 2025; **57**: 2461679 [*RCA*] [PMID: 39928093 DOI: 10.1080/07853890.2025.2461679] [FullText] [Full Text(PDF)]

61 **Japanese Gastric Cancer Association**. Japanese classification of gastric carcinoma: 3rd English edition. *Gastric Cancer* 2011; **14**: 101-112 [*RCA*] [PMID: 21573743 DOI: 10.1007/s10120-011-0041-5] [FullText]

62 **Fujiyoshi MRA**, Inoue H, Fujiyoshi Y, Nishikawa Y, Toshimori A, Shimamura Y, Tanabe M, Ikeda H, Onimaru M. Endoscopic Classifications of Early Gastric Cancer: A Literature Review. *Cancers (Basel)* 2021; **14**: 100 [*RCA*] [PMID: 35008263 DOI: 10.3390/cancers14010100] [FullText] [Full Text(PDF)]

63 **Fanelli RD**, Dombert LK. Advanced EUS: Future Applications. In: Kroh M, Docimo Jr. S, Djouzi SE, Shada A, Reavis KM, editors. The SAGES Manual Operating Through the Endoscope. Berlin: Springer, 2023: 673-686

64 **Cazacu IM**, Saftoiu A, Bhutani MS. Advanced EUS Imaging Techniques. *Dig Dis Sci* 2022; **67**: 1588-1598 [*RCA*] [PMID: 35451709 DOI: 10.1007/s10620-022-07486-9] [FullText]

65 **Gadour E**, Miutescu B, Raheem B, Al-Lehibi A, Alfadda A, Ghiuchici AM, Facciorusso A. Three-Dimensional Reconstruction and Navigation Systems in Endoscopic Ultrasound Procedures: A Comprehensive Review. *Diagnostics (Basel)* 2026; **16**: 366 [*RCA*] [PMID: 41594341 DOI: 10.3390/diagnostics16020366] [FullText] [Full Text(PDF)]

FOOTNOTES

Specialty type: Gastroenterology and hepatology

Country of origin: Algeria

Author contributions: Dous C contributed to the conceptualization, drafting, and critical revision of the review and approves the final version for publication.

Conflict-of-interest statement: The author reports no relevant conflicts of interest for this article.

S-Editor: Bai Y
L-Editor: A
P-Editor: Wang CH

Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA
Telephone: +1-925-3991568
E-mail: office@baishideng.com
Help Desk: https://www.f6publishing.com/helpdesk
https://www.wjgnet.com

© 2026 Baishideng Publishing Group Inc. All rights reserved.