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STRATEGIES OF EARLY DETECTION OF GASTRIC CANCER

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Gastric cancer ranks among the top global causes of cancer death, particularly in high incidence regions such as East Asia and Latin America. Early detection is critical because advanced stages carry poor prognosis. Population based screening programs and risk-stratified approaches have shown promise in reducing mortality. Key challenges include identifying high risk individuals amid diverse etiologies like *Helicobacter pylori* infection and dietary habits, while balancing screening benefits against procedural risks.

In screening, endoscopy stands as the gold standard for early gastric cancer detection, enabling direct visualization and biopsy of suspicious lesions. Non-invasive alternatives include serum pepsinogen testing combined with anti-*H. pylori* serology to identify atrophic gastritis which is a precancerous condition with high negative predictive value.

Emerging technologies enhances the detection precision. High-definition narrow-band imaging during endoscopy improves lesion characterization reducing unnecessary biopsies. Machine learning models integrating lifestyle factors like smoking, high-salt intake, and family history predict high-risk profiles with accuracy surpassing 85% in validation cohort studies. Risk scoring systems incorporating age, *H. pylori* status, and pepsinogen levels, facilitate opportunistic screening in clinical settings and prioritizing individuals with multiple risk factors.

Risk factors in gastric cancer span for modifiable and non-modifiable categories. Modifiable factors like *H. pylori* infection drives roughly 90% of non-cardia cases through chronic inflammation leading to atrophy and metaplasia. Also, dietary elements, including high-salt preserved foods and low fruit intake, synergize with smoking and alcohol to elevate odds ratios up to threefold increase in risk.

Non-modifiable factors with genetic predispositions, such as family history or polymorphisms in inflammation-related genes, compound environmental risks. Demographic factors like male sex, older age, and low socioeconomic status further correlate with higher incidence. Furthermore, pernicious anemia and prior gastric surgery represent medical precursors in gastric cancer. In Latin America, regional hotspots link to *H. pylori* prevalence and Andean genetics, underscoring tailored prevention needs.

Early detection strategies from endoscopic surveillance to predictive modeling substantially mitigate gastric cancer burden when targeted at high-risk populations. Therefore, future efforts should prioritize global *H. pylori* eradication, refined AI tools, and equitable access to surveillance, potentially halving mortality in vulnerable regions. Furthermore, integrated public health initiatives blending prevention and precision screening will offer a viable path forward.