Table 3. Diagnostic tests in studies evaluating wireless motility capsule

| Author, year | Diagnostic test | Criteria used for constipation or gastroparesis | Use of tobacco, prokinetics, narcotics, antidepressants, PPIs, laxatives at test time? | Diagnostic test protocol |
| --- | --- | --- | --- | --- |
| Kuo, 2011[12](#_ENREF_12) | Wireless motility capsule | Gastroparesis: Emptying time > 5 hours  Constipation: Colonic transit time > 59 hours | Tobacco NR  Prokinetics NR  No narcotics  Antidepressants allowed  No PPIs  No laxatives | Capsule swallowed  Std meal NR  Ensure NR |
| Rao, 2011[34](#_ENREF_34) | Wireless motility capsule | Gastroparesis: They used standard criteria of > 5 hours abnormal (disregard above)  Constipation: standard criteria of CTT > 59 hours | Tobacco NR  Prokinetics NR  No narcotics  No antidepressants  No PPIs  No laxatives | Capsule swallowed  Std meal: 255 kcal nutrition bar  Ensure NR |
| Rao, 2011[34](#_ENREF_34) | Gastric scintigraphy | Gastroparesis: greater than 10% retention at 4 hours (delayed gastric emptying) | Tobacco NR  Prokinetics NR  Narcotics NR  Antidepressants NR  PPIs NR  Laxatives NR | NFS |
| Rao, 2011[34](#_ENREF_34) | Colonic scintigraphy | Constipation: Retention of 6 or more radiopaque markers at 120 hours was deﬁned as abnormal colonic transit. | Tobacco NR  Prokinetics NR  Narcotics NR  Antidepressants NR  PPIs NR  Laxatives NR | NFS |
| Camilleri, 2010[32](#_ENREF_32) | Wireless motility capsule | Gastroparesis: > 5 hours  Constipation: 59 hours | Tobacco NR  No prokinetics  No narcotics  No antidepressants  No PPIs  No laxatives | Capsule swallowed  Std meal: egg beaters  Ensure given 6 h after test |
| Camilleri, 2011[32](#_ENREF_32) | Radiopaque markers | Gastroparesis: > 5 hours  Constipation: 67 hours | Tobacco NR  No prokinetics  No narcotics  No antidepressants  No PPIs  No laxatives | 24 ROM on 3 successive days  X-ray day 4 (72 h after ingestion of first set) and day 7 (144 h after ingestion of first set)  Type of counts: both segment and total colon |
| Saad, 2010[50](#_ENREF_50)  [Sub-analysis of data[17](#_ENREF_17)] | Wireless motility capsule | Constipation: based on 95th percentile of healthy control population | Tobacco NR  No prokinetics  Narcotics NR  Antidepressants allowed  No PPIs  No laxatives | Capsule swallowed  Std meal: SmartBar  Ensure given 6 h after test |
| Saad, 2010[50](#_ENREF_50)  [Sub-analysis of data[17](#_ENREF_17)] | Radiopaque markers | Constipation: delayed whole got transit defined as retention of >20% of ROM after 5 days | Tobacco NR  No prokinetics  Narcotics NR  Antidepressants allowed  No PPIs  No laxatives | 24 ROM in capsule  X-ray 48 h after ingestion |
| Hasler, 2009[49](#_ENREF_49)  [Subset of study[17](#_ENREF_17)] | Wireless motility capsule | Constipation: >59 hours transit time | Tobacco NR  No prokinetics  No narcotics  Antidepressants allowed  No PPIs  No laxatives | Capsule swallowed  Std meal: SmartBar  Ensure given 6 h after test |
| Hasler, 2009[49](#_ENREF_49)  [Subset of study[17](#_ENREF_17)] | Radiopaque markers | Constipation: >59 hours transit time | Tobacco NR  No prokinetics  No narcotics  Antidepressants allowed  No PPIs  No laxatives | 24 ROM in capsule  X-ray as needed  Type of counts NR |
| Rao, 2009[17](#_ENREF_17) | Wireless motility capsule | Constipation: based on 95th percentile of healthy control population as 59 hours for women and 44 hours for men | Tobacco NR  No prokinetics  Narcotics NR  Antidepressants allowed  No PPIs  No laxatives | Capsule swallowed  Std meal: SmartBar  Ensure given 6 h after test |
| Rao, 2009[17](#_ENREF_17) | Radiopaque markers | Constipation: based on 95th percentile of healthy control population as 59 hours for women and 44 hours for men | Tobacco NR  No prokinetics  Narcotics NR  Antidepressants allowed  No PPIs  No laxatives | 24 ROM in one capsule  X-ray 48 h after ingestion and 120 h after ingestion and 21 days after ingestion  Type of co unts NR |
| Kuo, 2008[16](#_ENREF_16) | Wireless motility capsule | Gastroparesis: Threshold not reported; abrupt pH rise (usually >3 pH units) from gastric baseline to a pH >4 as determined by software and 2 reviewers. | No tobacco for healthy  Tobacco NR for gastroparetic  No prokinetics  No narcotics  Antidepressants allowed  No PPIs for gastroparetic  No laxatives | Capsule swallowed  Std meal: scrambled egg substitute, bread, strawberry jam, water  Ensure given 6 h after test |
| Kuo, 2008[16](#_ENREF_16) | Gastric scintigraphy 4h | Gastroparesis: >10% retained at 4h as determined by X-ray | No tobacco for healthy  Tobacco NR for gastroparetic  No prokinetics  No narcotics  Antidepressants allowed  No PPIs for gastroparetic  No laxatives | 4-hour/Tougas duration  Solid components used |
| Kuo, 2008[16](#_ENREF_16) | Gastric scintigraphy 2h | NR | No tobacco for healthy  Tobacco NR for gastroparetic  No prokinetics  No narcotics  Antidepressants allowed  No PPIs for gastroparetic  No laxatives | 2-hour duration  Solid components used |
| Brun, 2011[41](#_ENREF_41) | Wireless motility capsule | Gastroparesis: NFS | NR | NR |
| Brun, 2011[41](#_ENREF_41) | Gastric scintigraphy | Gastroparesis: NFS | NR | Radioactive meal  Meal retention assessed at 2 h and 4 h |
| Mysore, 2010[52](#_ENREF_52) | Wireless motility capsule | NR | NR | NR |
| Mysore, 2010[52](#_ENREF_52) | Standard testing | NR | NR | NFS |
| Mysore, 2010[53](#_ENREF_53)  [earlier version of study[34](#_ENREF_34)] | Wireless motility capsule | NR | NR | NR |
| Mysore, 2010[53](#_ENREF_53)  [earlier version of study[34](#_ENREF_34)] | Gastric scintigraphy | NR | NR | NR |
| Mysore, 2010[53](#_ENREF_53)  [earlier version of study[34](#_ENREF_34)] | Antroduodenal manometry | NR | NR | NR |
| Mysore, 2010[53](#_ENREF_53)  [earlier version of study[34](#_ENREF_34)] | Colonic scintigraphy | NR | NR | NR |
| Mysore, 2010[53](#_ENREF_53)  [earlier version of study[34](#_ENREF_34)] | Radiopaque markers | NR | NR | NR |
| Lee, 2010[42](#_ENREF_42) | Wireless motility capsule | NR | NR | NR |
| Lee, 2010[42](#_ENREF_42) | Other diagnostic motility tests, including 4-hr gastric scintigraphy | NR | NR | Gastric scintigraphy: 4-hour/Tougas duration  ROM: circles |
| Reddymasu, 2010[43](#_ENREF_43) | Wireless motility capsule | Gastroparesis: (gastric cph <73 or frequency of gastric contractions >100 mmHg being less than 2/hour) | NR | NR |
| Reddymasu, 2010[43](#_ENREF_43) | Gastric scintigraphy | Gastroparesis: abnormal if >10% of the radio-labeled meal was retained in the stomach at the end of 4 hours. | NR | NR |
| Paulson, 2009[51](#_ENREF_51) | Wireless motility capsule | NR | NR | NR |
| Paulson, 2009[51](#_ENREF_51) | Anal manometry | NR | NR | NR |
| Lee, 2009[44](#_ENREF_44) | Wireless motility capsule | NR | NR | NR |
| Rao, 2009[46](#_ENREF_46) | Wireless motility capsule | NR | NR | Capsule swallowed |
| Rao, 2009[46](#_ENREF_46) | Radiopaque markers | NR | NR | NR |
| Rao, 2009[47](#_ENREF_47) | Wireless motility capsule | NR | NR | Capsule swallowed  Std meal: nutrient bar  Ensure given 6 h after test |
| Lee, 2012[45](#_ENREF_45) | Wireless motility capsule | Gastroparesis: 5 hours | Tobacco NR  No prokinetics  No narcotics  Antidepressants NR  No PPIs  Laxatives NR | Capsule swallowed  Std meal: 50 mL water  Ensure given 6 h after test |
| Lee, 2012[45](#_ENREF_45) | Gastric scintigraphy | Gastroparesis: <10% gastric retention at 4 h. | Tobacco NR  No prokinetics  No narcotics  Antidepressants NR  No PPIs  Laxatives NR | Std meal: eggbeaters with markers  4-hour/Tougas duration  Solid components given  Meal retention assessed at 2 h and 4 h |
| Rao, 2012[48](#_ENREF_48) | Wireless motility capsule | Constipation: Rome III | No prokinetics for 48 hours  No PPIs for 7 days  No laxatives for 48 hours | Capsule swallowed  Std meal: nutrient bar and 50 mL water |
| Rao, 2012[48](#_ENREF_48) | Radiopaque markers | Constipation: Rome III | No prokinetics for 48 hours  No PPIs for 7 days  No laxatives for 48 hours | Single capsule with 24 ROM swallowed directly before WMC |

Abbreviations: BMI = body mass index; CTT = colon transit time; GES = gastric emptying scintigraphy; GET = gastric emptying time; GI = gastrointestinal; h = hours; kg = kilogram; LGI = lower gastrointestinal tract; m = meter; mL = milliliter; NA = not applicable; NFS = not further specified; NR = not reported; PPI = proton pump inhibitor; ROM = radiopaque markers; Std = standardized; UGI = upper gastrointestinal tract; US = United States; WMC = wireless motility capsule