**Supplementary Table 1: Specific Aspects of Fecal Microbiota Transplantation Requiring Targeted Study**

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| **Aspect** | **Rationale** |
| Donor selection | Microbiome analyses to seek particular organisms of value in specific disease state.  Avoidance of potential microbiome transmissible disease states e.g. obesity. |
| Recipient selection and timing | Identifying candidates with diseases amenable to FMT at the most appropriate stage of disease for this intervention (window of opportunity). |
| Matching of donor to recipient | Identification of compatible microbial profiles between donor and host to support likelihood of engraftment.  Identification of particular microbial niche in recipient and appropriate colonisers in donor- may in some cases be individual-specific and not disease-specific, may be function-driven e.g. butyrate production in ulcerative colitis rather than genus or species-specific. |
| Induction treatment (pre-FMT) | Deliberate alteration of recipient state to open up microbial niche for colonization (antibiotic +/- dietary alteration most likely) or to support early engraftment. |
| Support of graft longevity | The pre-treatment microbiome is host-specific and influenced by lifestyle parameters, particularly diet. The donor microbiome may not be inherently compatible with the host lifestyle; how can we modify and influence this to support engraftment and promote sustainability. |
| Optimal method of administration | Most commonly used are upper gastrointestinal (nasogastric or nasojejunal) or distal (colonoscopic or enema) - very little is known about optimal method but theoretically colonoscopic would allow greater dosing to the target organ, though this is costly, logistically challenging and may not always be necessary |
| Treatment course (dose) of FMT and “top-ups” | As for other medical therapies, understanding the dose and duration of therapy needed to achieve the optimum balance of effect against risk/convenience. |
| Markers of success- positive engraftment | Moving beyond simple yes/no clinical parameters of success and on to an incorporation of whether or not the therapy was microbially successful (picking up weaker signals of success and optimising FMT protocols going forward). |
| Measures of sustained engraftment | As the microbiome is in a constant state of challenge and flux, and distinct to the host, measures of longevity of engraftment will be important in looking at the duration of any efficacy seen in a particular indication. Can we alter long-term colonisation, and should we be aiming to do so? |
| Novel FMT applications (pill-based, freeze-thawed FMT, multi-donor, etc) | Each new approach to the FMT itself warrants specific consideration in different disease indications. |
| Choice of placebo | The choice of placebo is a challenge in FMT studies, particularly where blinding is desired/sought. Patient’s own stool is not microbiologically inert, particularly if processed in any way or administered to a different site (nasogastric or nasoduodenal for example). A standardized approach to placebo for FMT studies would be a welcome addition to the literature. |

**Supplementary Table 2: Active pediatric FMT studies listed on ClinicalTrials.gov (accessed December 2017).**

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| Condition | Identifier, lead center | Target cohort | Study design | Comparator | Primary Outcome Measures | FMT method (Dosing) | N | Status |
| rCDI | NCT02134392,  Columbus, Ohio, USA | Age 2-21, rCDI, need for colonoscopy | Open label, single group assignment | NA | Resolution of C. difficile 6 months post-FMT | Colonoscopy or enema (single dose) | 15 | Recruiting |
| rCDI | NCT03117582, Chapel Hill, North Carolina, USA | Age 1-99, rCDI, not responding to antibiotics | Observational | NA | Resolution of diarrhoea | Colonoscopy (single dose) | NR | Invitation only |
| rCDI | NCT03268213, Stony Brook, New York, USA | Age ≥ 7, rCDI, not responding to antibiotics | Open label, single group assignment | NA | Safety and tolerability, efficacy | NR | 50 | Recruiting |
| rCDI | NCT02423967, Rochester, Minnesota, USA | Age 1-18, rCDI, not responding to antibiotics | Randomized, open label | Fresh familial stool vs frozen anonymous stool | Recurrence of C. difficile | NR | 40 | Recruiting |
| rCDI | NCT02636517, Philadelphia, Pennsylvania,  USA | Age 3–21, known IBD patients with rCDI (and non-IBD with rCDI) | Non-randomized, open label | Patients with CDI  and no IBD | Recurrence of C. difficile | Colonoscopy (single dose) | 50 | Recruiting |
| CD | NCT03194529, Los Angeles, California, USA | Age 7-21, CD in remission (PCDAI <10), need for upper endoscopy | Open label, single group assignment | NA | Safety | Upper endoscopy (single dose) | 10 | Recruiting |
| CD | NCT02330211  Boston, Massachusetts, USA | Age 5-30, active Crohn’s colitis (PCDAI >10) | Phase I/II, randomized placebo controlled | Placebo | Safety and tolerability, improvement PCDAI | Enema induction with  capsule maintenance (weekly for 8 weeks) | 60 | Recruiting |
| CD | NCT03267238, Stony Brook, New York, USA | Age ≥7, CD relapse or treatment-refractory | Open label, single group assignment | NA | Fecal Calprotectin | NR | 40 | Recruiting |
| UC | NCT02291523, Los Angeles, California, USA | Age: 7-21, mild to moderate UC (PUCAI 10-64), need for colonoscopy | Randomized placebo controlled | Autologous FMT | Disease remission | Colonoscopy (single dose) | 101 | Recruiting |
| UC | NCT02330653, Boston, Massachusetts, USA | Age 5-30, active UC (PUCAI >9) and failed, intolerant to, or refused first-line maintenance therapy | Phase I/II, randomized placebo controlled | Placebo | Safety and tolerability, improvement PUCAI | Enema induction with  capsule maintenance (weekly for 8 weeks) | 60 | Recruiting |
| UC | NCT02033408  Jerusalem, Israel | Age 2-75, acute severe colitis requiring iv steroids | Randomized controlled trial: steroids ± antibiotics;  Non-randomized, uncontrolled open-label arm: FMT for non-responders | Multiple groups: Steroids ± antibiotics | Disease activity | NR | 28 | Recruiting |
| UC, IBD-U | NCT02487238,  Hamilton, Ontario, Canada | Age 3-17, active UC or IBD‑U on stable background therapy | Single-blind, randomized placebo controlled | Saline Enema | Feasibility | Enemas (dosing 12/6 weeks) | 50 | Recruiting |
| UC | NCT01961492,  Turku, Finland, | Age 1-75, active UC (PUCAI 10-64) | Randomized, open label | Standard care | Disease activity | Colonoscopy (single dose) | 40 | Recruiting |
| MDRO | NCT02543866, Seattle, Washington, USA | Age 7-21, ≥1 infection with ESC-R Enterobacteriaceae. | Open label, single group assignment | NA | Safety and Tolerability | Nasogastric tube (single dose) | 20 | Recruiting |
| GvHD, acute | NCT03148743,  Suzhou, Jiangsu, China | Age 10-60, acute intestinal GvHD | Observational | NA | Stool frequency | NR | 20 | Recruiting |
| Epilepsy | NCT02889627,  Nanjing, Jiangsu, China | Age 12-70, epilepsy with >1 seizure per 6 months | Randomized placebo controlled | Saline | Frequency of the seizures. | Mid-gut infusion (single dose) | 100 | Recruiting |

An electronic search (https://clinicaltrials.gov/ct2/home) was conducted using search terms “FMT” or “fecal microbiota transplantation”. The following filter were applied: Recruiting; Enrolling by invitation; Active; not recruiting; Child (birth–17). Abbreviations: CD, Crohn’s disease; ESC-R, extended-spectrum resistant; IBD-U, IBD unclassified; NA, non-applicable; NR, not reported; PCDAI, Paediatric CD Activity Index; PUCAI, Pediatric UC activity index; UC, ulcerative colitis;