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

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).

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	Age 5-30, active Crohn's colitis (PCDAI >10)	Phase I/II, randomized	Placebo	Safety and tolerability,	Enema induction with	60	Recruiting

	Boston, Massachusetts, USA		placebo controlled		improvement PCDAI	capsule maintenance (weekly for 8 weeks)		
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;