New faecal calprotectin cut-off points for remission and active disease defined by UCEIS and Nancy indices in ulcerative colitis (UC)

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BACKGROUND

- Disease activity assessment is an essential part of management in UC
- It most accurately evaluated by endoscopy and biopsy
- Most published cut-offs for faecal calprotectin (FCal) in UC are based on prediction of relapse, rather than prediction of current endoscopic or histopathologic activity

METHODS

- The TrueColours UC pilot collected daily symptoms (simple clinical colitis activity index, SCCAI), monthly FCal (IBDoc®), and endoscopic/histopathological activity (UCEIS and Nancy indices) at two time points over 6 months

- Correlations between the below values were computed by repeated measurements correlations (rmcorr) in the R package
  o FCal (µg/g),
  o SCCAI (median of measurements for 14 days prior to FCal),
  o UCEIS (range 0-8, within 14 days of FCal), and
  o Nancy indices

- Definitions of remission and active disease remain debated, so two groups were created.
  Group A defined remission as UCEIS 0 AND Nancy 0, and active disease as UCEIS ≥4 AND Nancy ≥3.
  Group B defined remission as UCEIS ≤1 AND Nancy ≤1, and active disease as UCEIS ≥4 AND Nancy ≥3.

- Mann-Whitney U test was applied to values of FCal to estimate statistical significance.
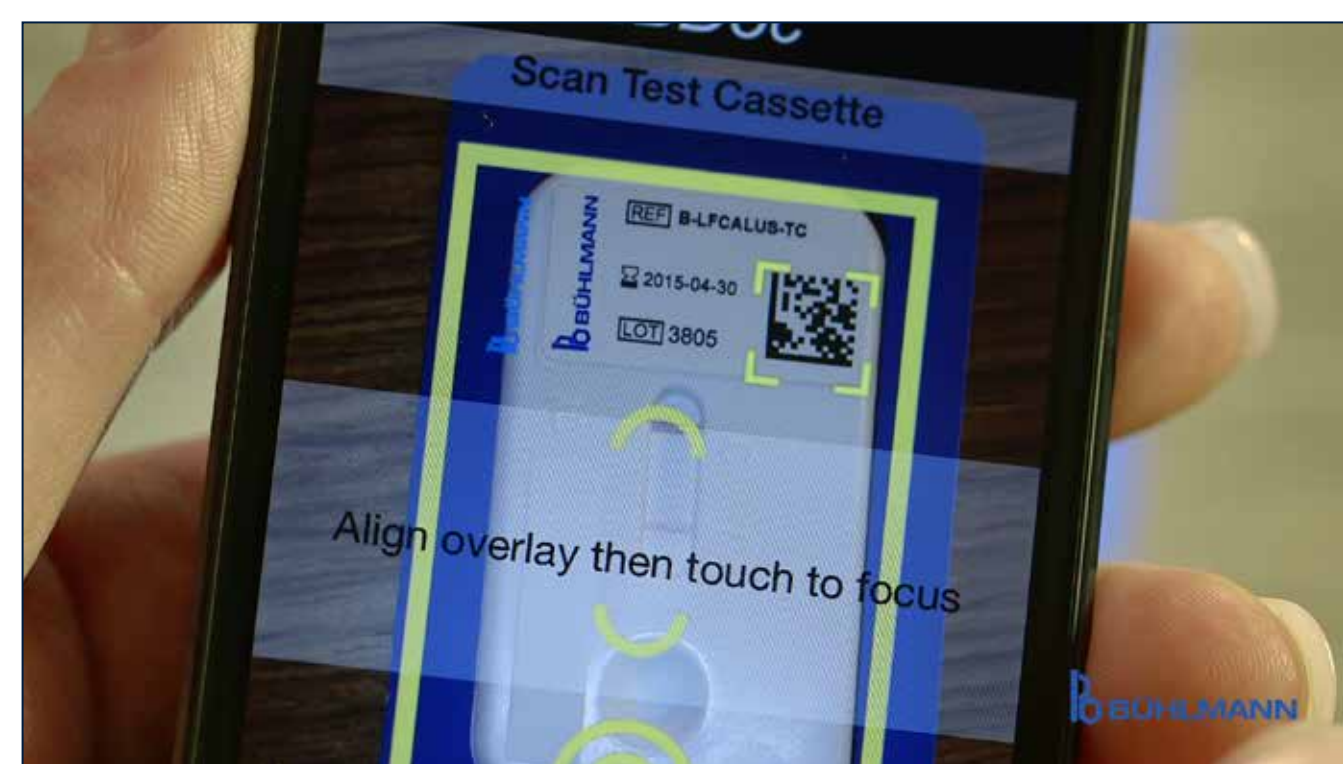
RESULTS

- The number of times that a correlation could be made between FCal and other indices was termed 'number of instances' (Table 1)
- There was poor correlation between FCal and SCCAI (rmcorr 0.311), but good correlation with UCEIS and Nancy indices

Table 1: Pair-wise correlations between FCal and other indices

	FCal rmcorr	95%CI	Number of instances	p-value
SCCAI (median 5 days prior to FCal)	0.311	0.159 to 0.449	198	0.000148
UCEIS (within 14 days of FCal)	0.701	0.243 to 0.903	53	0.003617
Nancy (within 14 days of FCal)	0.829	0.511 to 0.947	53	0.000134

Fcal = IBDoc® faecal calprotectin (measured in µg/g of faeces), 95% CI = 95 % confidence intervals,

- The distributions of FCal values for the combined UCEIS AND Nancy criteria (Figure 1) show highly significant (p<0.0001) discrimination by FCal between endoscopic and histologically defined remission and active disease in both groups
- Contingency tables for remission and active groups are presented in Figure 2

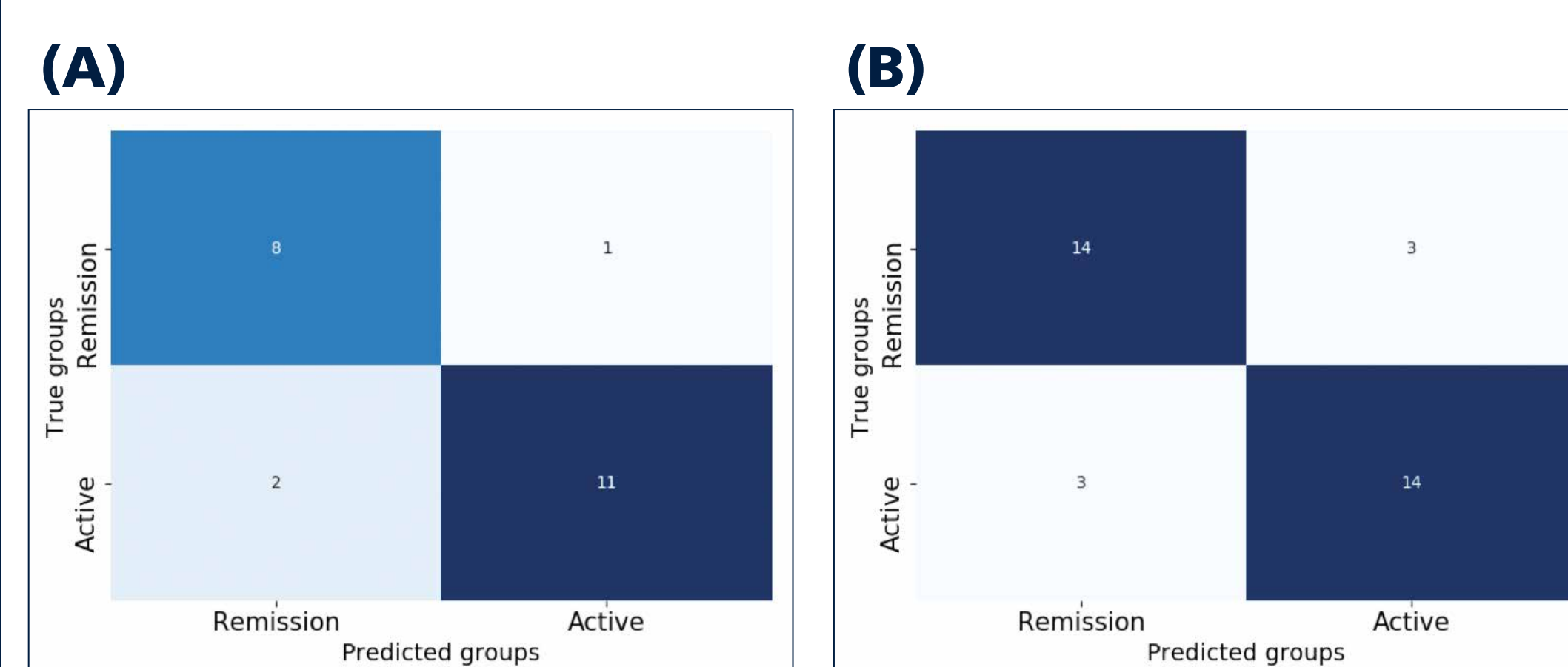### Figure 1: Distribution of FCal for remission and active disease
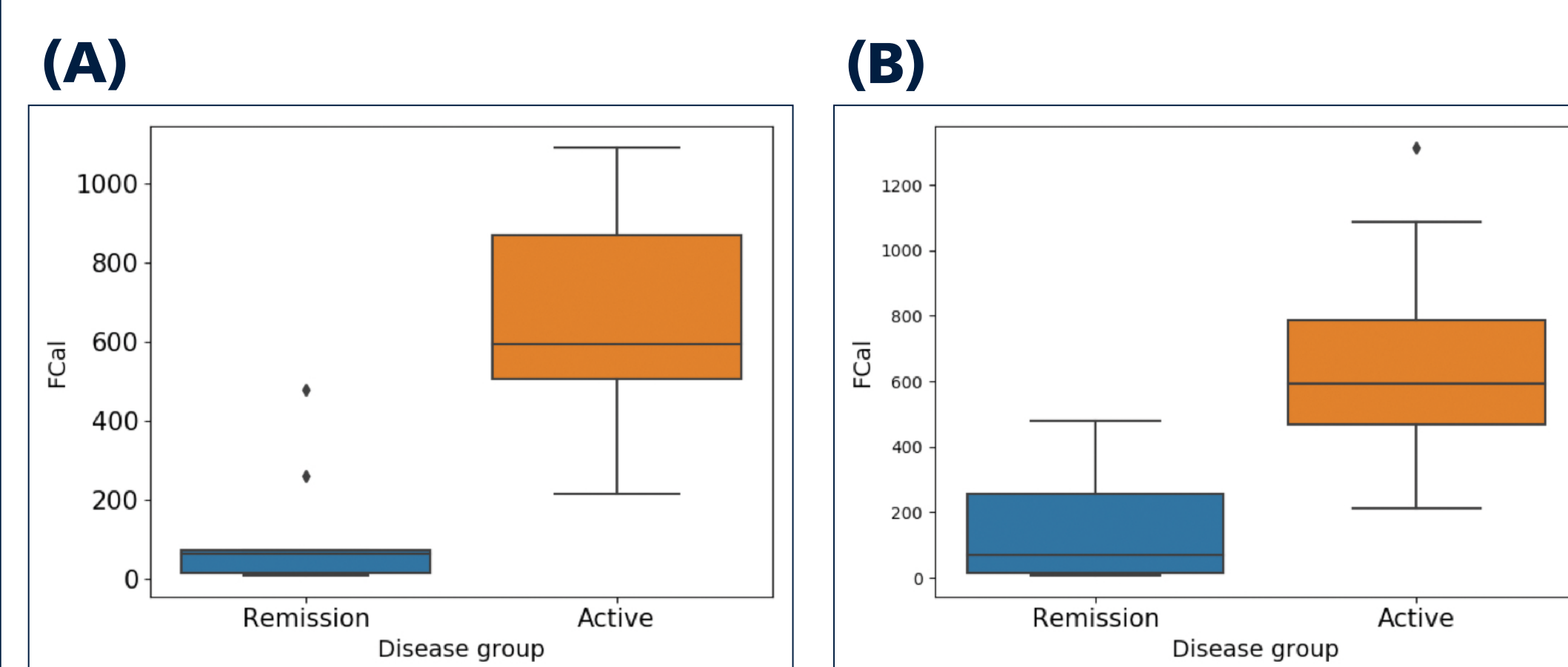
(A) Remission defined as UCEIS = 0 AND Nancy = 0. Active disease defined as UCEIS ≥4 AND Nancy ≥3.
(B) Remission defined as UCEIS = 0 -1 AND Nancy <=1. Active disease defined as UCEIS ≥4 AND Nancy ≥2.

p-values <0.000001 for both (A) and (B)

Figure 2: Contingency tables for predicted and true remission and active disease

(A) Remission defined as UCEIS = 0 AND Nancy = 0. Active disease defined as UCEIS ≥4 AND Nancy ≥3.
(B) Remission defined as UCEIS = 0 -1 AND Nancy <=1. Active disease defined as UCEIS ≥4 AND Nancy ≥2.

- FCal cut offs for remission were 147µg/g (UCEIS 0 AND Nancy 0) and 180µg/g (UCEIS ≤1 AND Nancy ≤1) (Table 2)

Table 2: Summary of classification procedure for remission and active disease groups

	UCEIS **AND** Nancy Remission UCEIS 0 **AND** Nancy 0 Active disease UCEIS ≥4 **AND** Nancy ≥3	UCEIS **AND** Nancy Remission UCEIS ≤1 **AND** Nancy ≤1 Active disease UCEIS ≥4 **AND** Nancy ≥2
Cut-off Fcal (µg/g)	147	180
Accuracy	86%	82%
Sensitivity	85%	82%
Specificity	89%	82%
ROC AUC	0.888	0.920

Fcal = IBDoc® faecal calprotectin (measured in µg/g of faeces)

UCEIS = Ulcerative Colitis Endoscopic Index of Severity,

Nancy = Nancy Histopathologic Index where

CONCLUSIONS

- An FCal <180 µg/g is indicative of endoscopic and histological remission
- FCal may act as a reliable marker of mucosal healing, replacing the need for endoscopy in some patients

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