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BÜHLMANN Calprotectin – A Tool to Monitor IBD

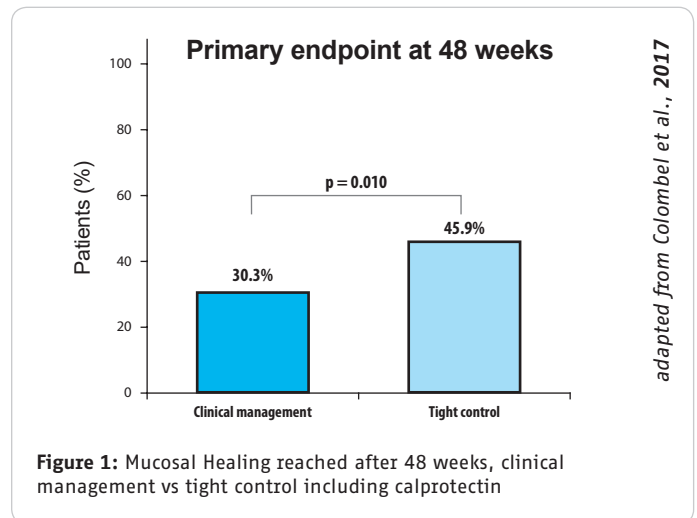


CALM Study

The CALM Study including more than 200 Crohn's Disease (CD) patients in an adalimumab dose escalation project, showed that treating to target with tight monitoring using calprotectin and CRP was significantly superior in reaching mucosal healing after 48 weeks, as compared to conventional patient management based on CDAI alone. **Calprotectin especially was a decisive factor.** 45.9% of patients with calprotectin based tight monitoring reached this primary endpoint as compared to 30% with conventional management (Fig. 1). Steroid free remission was also achieved significantly more often in the calprotectin tight monitoring arm.

Benefit:

CALM showed a remarkable outcome for fecal calprotectin as an objective biomarker to monitor and guide therapy.



BÜHLMANN Calprotectin

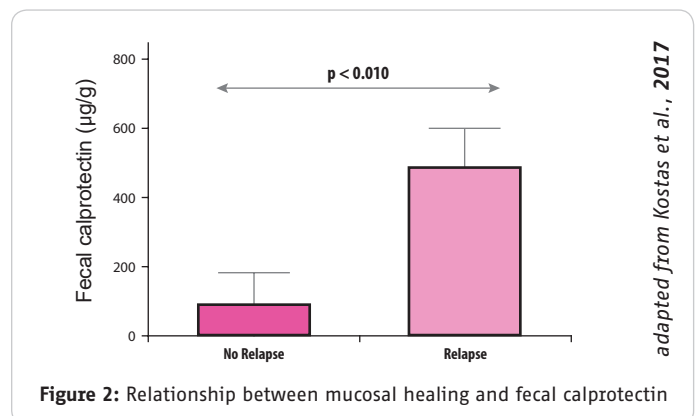
Published data shows the value of BÜHLMANN Calprotectin in disease monitoring and patient management with cut-off indications

BÜHLMANN Calprotectin reflects the degree of Mucosal Healing

Kostas *et al.* (2017) described a strong correlation between endoscopically defined mucosal healing and calprotectin values below 174 µg/g in a mixed population of 113 CD and 36 Ulcerative Colitis (UC) patients (Fig. 2).

Benefit:

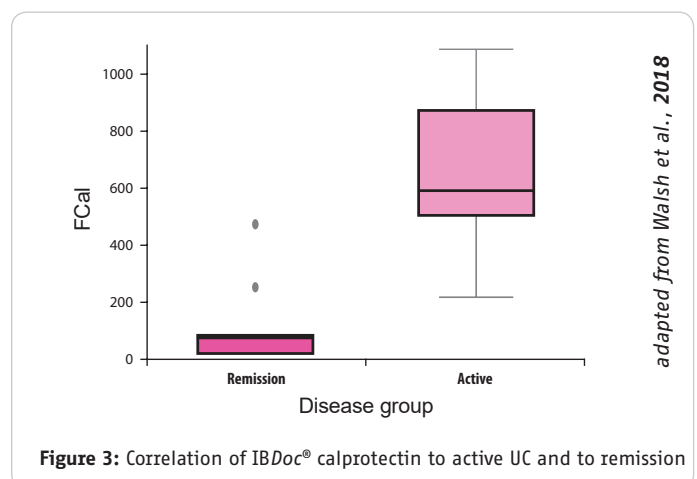
BÜHLMANN Calprotectin helps indicate Mucosal Healing in IBD patients.



Walsh *et al.* from Oxford showed that patient measured calprotectin with the BÜHLMANN IBDoc® Home Test, highly correlated with histological remission (Nancy Score 0) in the UC True Colours patient cohort with a cut-off of 147 µg/g (Fig. 3). This result is in tune with Guardiola *et al.* (2014), who established a calprotectin value measured by BÜHLMANN fCAL® ELISA above 155 µg/g as reliable indicator for histological inflammation in UC patients in clinical and endoscopic remission. Lobaton *et al.* (2013) showed with Quantum Blue® rapid tests that calprotectin works as a surrogate marker to predict endoscopic remission at levels below 272 µg/g in UC and CD patients.

Benefit:

IBDoc®, BÜHLMANN fCAL® ELISA and Quantum Blue® highly correlate with histologic healing and accurately predict remission.

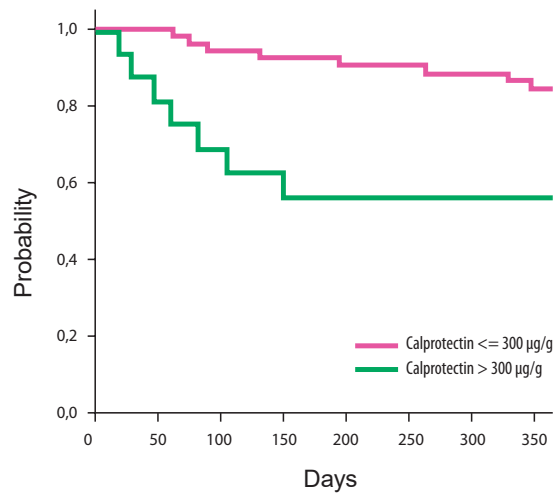


BÜHLMANN Calprotectin predicts increased risk of relapse

Theede *et al.* (2016) investigated calprotectin for IBD patient management by studying a group of 70 UC patients in remission over a 12 months follow-up with BÜHLMANN fCAL® ELISA. ROC analysis with an Area Under the Curve of 0.775 estimated a cut-off value of $>321 \mu\text{g/g}$ to predict relapse at 6 months and a significant increase in relapse rate after 12 months for patients at measured levels of above $300 \mu\text{g/g}$ (Fig. 4).

Benefit:

BÜHLMANN Calprotectin supports relapse prediction in IBD patients without symptoms within 6 months.



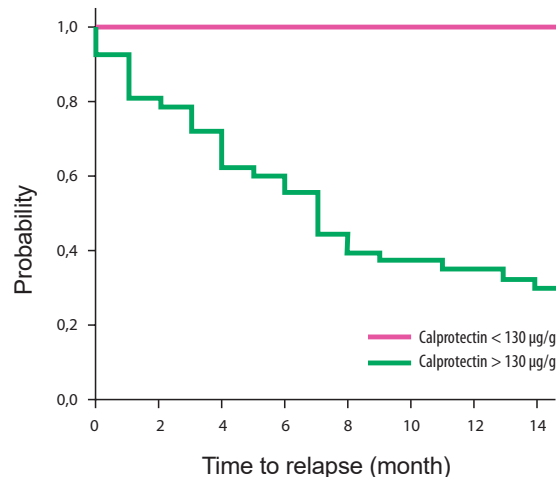
adapted from Theede *et al.*, 2016

Figure 4: Kaplan-Meier plot showing relapse rates during a one year follow-up at a calprotectin cut off of $300 \mu\text{g/g}$

Ferreiro-Iglesias *et al.* (2016) screened CD and UC patients (71 and 24 respectively) under anti-TNF therapy. Fecal calprotectin was measured with the BÜHLMANN Quantum Blue® rapid test in 4 month intervals. This study shows that a calprotectin level $<130 \mu\text{g/g}$ is associated with maintained disease remission (Fig.5) and a calprotectin level $>300 \mu\text{g/g}$ predicts relapse over the following 4 months with high significance, especially when two consecutive measurements are performed (Fig.6).

Benefit:

BÜHLMANN Calprotectin is a valuable predictor of clinical relapse and of remission in IBD patients under anti-TNF therapy.

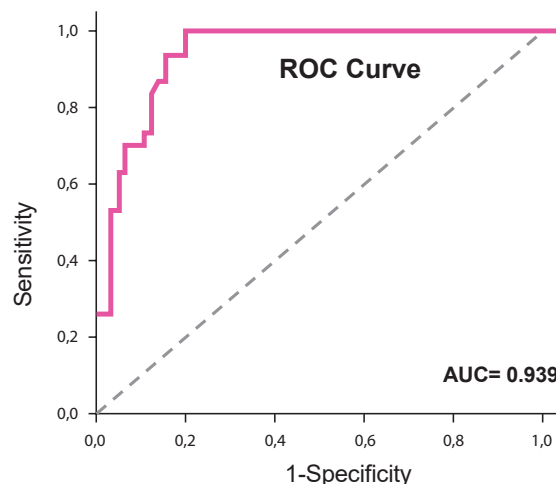


adapted from Ferreiro-Iglesias *et al.*, 2016

Figure 5: Kaplan-Meier plot of relapse free time interval for IBD patients in relation to calprotectin below or above $130 \mu\text{g/g}$.

References:

- Colombel, J. *et al.*, 2017:** Effect of tight control management on Crohn's disease (CALM): a multicentre, randomised controlled phase 3 trial, *The Lancet*
- Ferreiro-Iglesias, R. *et al.*, 2016:** Accuracy of Consecutive Fecal Calprotectin Measurements to Predict Relapse in Inflammatory Bowel Disease Patients Under Maintenance With Anti-TNF Therapy, *J Clin Gastroenterol*
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- Kostas, A. *et al.*, 2017:** Fecal calprotectin measurement is a marker of short-term clinical outcome and presence of mucosal healing in patients with inflammatory bowel disease, *World J Gastroenterol*
- Lobaton Ortega, T. *et al.*, 2013 (1):** A New Rapid Quantitative Test for fecal Calprotectin Predicts Endoscopic Activity in Ulcerative Colitis, *Inflamm Bowel Dis*
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- Walsh *et al.*, 2018:** New faecal calprotectin cut-off points for remission and active disease defined by UCEIS and Nancy indices in ulcerative colitis (UC), P262 ECCO IBD 2018



adapted from Ferreiro-Iglesias *et al.*, 2016

Figure 6: ROC curve of fecal calprotectin levels to predict relapse in IBD patients.

The BÜHLMANN calprotectin Assay Portfolio for Diagnosis and Monitoring of IBD

IBDoc® The Calprotectin Home Test



Quantum Blue® fCAL Rapid Test



BÜHLMANN fCAL® ELISA The Gold Standard



BÜHLMANN fCAL® turbo For Lab Automation



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Ordering Codes:

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IBDoc® Calprotectin Kit	LF-IBDOC8
Quantum Blue® Reader	BI-POCTR-ABS
Quantum Blue® fCAL	LF-CAL25 / LF-CHR25 / LF-CALE25
BÜHLMANN fCAL® ELISA	EK-CAL / EK-CAL2 / EK-CAL2-WEX
BÜHLMANN fCAL® turbo	KK-CAL (Kit)
	B-KCAL-RSET (Reagent Kit)
	B-KCAL-CASET (Calibrator Kit)
	B-KCAL-CONSET (Control Kit)

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