Diagnostic Performance of a Convolutional Neural Network for Diminutive Colorectal Polyp Recognition

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The intended main result of this project is the realization of a CAD-CNN system prototype that optically diagnosis colorectal polyps during a colonoscopy with great precision and fast processing time. We hypothesize that this CAD-CNN system will be...

Ethische beoordeling	Positief advies
Status	Werving gestart
Type aandoening	-
Onderzoekstype	Observationeel onderzoek, zonder invasieve metingen

Samenvatting

ID

NL-OMON26387

Bron
Nationaal Trial Register

Verkorte titel
POLAR

Aandoening

Colorectal cancer, colorectal polyps

Ondersteuning

Primaire sponsor: Amsterdam UMC, location AMC
Overige ondersteuning: The collaboration project is co-funded by the PPP Allowance made available by Health~Holland, Top Sector Life Sciences & Health, to the Dutch Digestive Disease Foundation to stimulate public-private partnerships (TKI 18-01); the European Regional Development Fund region Northern-Netherlands (UP-18-00565); and the province of Friesland. ZiuZ Medical B.V provided research equipment on loan for this study.

Onderzoeksproduct en/of interventie

Uitkomstmaten

Primaire uitkomstmaten

The primary outcome of the study is the accuracy of the CAD-CNN system for predicting histology of diminutive colorectal polyps (1-5mm) compared with the accuracy of the prediction of the endoscopist. Both the CAD-CNN system and the endoscopist will use NBI for their predictions.

Accuracy is defined as the percentage of correctly predicted optical diagnoses of the CAD-CNN system and/or endoscopist compared to the gold standard pathology. For the calculation of the accuracy, adenomas and SSLs will be dichotomised as neoplastic polyps, while HPs and other non-neoplastic histology are considered non-neoplastic.

Toelichting onderzoek

Achtergrond van het onderzoek

Rationale: Diminutive colorectal polyps (1-5mm in size) have a high prevalence and very low risk of harbouring cancer. Current practice is to send all these polyps for histopathological assessment by the pathologist. If an endoscopist would be able to correctly predict the histology of these diminutive polyps during colonoscopy, histopathological examination could be omitted and practise could become more time- and cost-effective. Studies have shown that prediction of histology by the endoscopist remains dependent on training and experience and varies greatly between endoscopists, even after systematic training. Computer aided diagnosis (CAD) based on convolutional neural networks (CNN) may facilitate endoscopists in diminutive polyp differentiation. Up to date, studies comparing the diagnostic performance of CAD-CNN to a group of endoscopists performing optical diagnosis during real-time colonoscopy are lacking.

Objective: To develop a CAD-CNN system that is able to differentiate diminutive polyps during colonoscopy with high accuracy and to compare the performance of this system to a group of endoscopist performing optical diagnosis, with the histopathology as the gold standard.

Study design: Multicentre, prospective, observational trial. Study population: Consecutive patients who undergo screening colonoscopy (phase 2)

Main study parameters/endpoints: The accuracy of optical diagnosis of diminutive colorectal polyps (1-5mm) by CAD-CNN system compared with the accuracy of the endoscopists. Histopathology is used as the gold standard.

Doel van het onderzoek

The intended main result of this project is the realization of a CAD-CNN system prototype that optically diagnosis colorectal polyps during a colonoscopy with great precision and fast processing time. We hypothesize that this CAD-CNN system will be more accurate than endoscopists for making an optical diagnosis of diminutive polyps.

Onderzoeksopzet

None

Onderzoeksproduct en/of interventie

None

Contactpersonen

Publiek

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Wetenschappelijk

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Deelname eisen

Belangrijkste voorwaarden om deel te mogen nemen (Inclusiecriteria)

- Patients older than 18 years undergoing a screening colonoscopy.
- Signed informed consent

Belangrijkste redenen om niet deel te kunnen nemen

(Exclusiecriteria)

- Boston bowel preparation score < 6
- Incomplete colonosopy
- Diagnosis of inflammatory bowel disease, Lynch syndrome or (serrated) polyposis syndrome.

Onderzoeksopzet

Opzet

Type:	Observationeel onderzoek, zonder invasieve metingen
Onderzoeksmodel:	Anders
Toewijzing:	N.v.t. / één studie arm
Blindering:	Open / niet geblindeerd
Controle:	N.v.t. / onbekend

Deelname

Nederland

Status:	Werving gestart
(Verwachte) startdatum:	16-10-2018
Aantal proefpersonen:	292
Type:	Verwachte startdatum

Voornemen beschikbaar stellen Individuele Patiënten Data (IPD)

Wordt de data na het onderzoek gedeeld: Nog niet bepaald

Ethische beoordeling

Positief advies

Datum:	09-06-2020
Soort:	Eerste indiening

Registraties

Opgevolgd door onderstaande (mogelijk meer actuele) registratie

Geen registraties gevonden.

Andere (mogelijk minder actuele) registraties in dit register

Geen registraties gevonden.

In overige registers

Register	ID
NTR-new	NL8700
Ander register	METC AMC : W18-422

Resultaten