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Exploring new PET/CT capabilities and machine learning for improving the diagnosis of infective endocarditis

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Exploring new PET/CT capabilities and machine learning for improving the diagnosis of infective endocarditis

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the decision by the College of Deans.

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Monday 13 May at 12:45 hours

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Abbreviations

AC	Attenuation correction
AHA	American Heart Association
AI	artificial intelligence
ANOVA	Analysis of Variance
AV-block	Atrioventricular block
AVR	aortic valve replacement
AUC	area Under the Curve
AWJMG	Andor W.J.M. Glaudemans
BC	blood culture
BMI	body mass index
BS	Bhanu Sinha
BSAC	British Society for Antimicrobial Chemotherapy
11C	carbon-11 (a radioisotope of carbon)
<i>C. acnes</i>	<i>Cutibacterium acnes</i> (formerly known as <i>Propriani acnes</i>)
CABG	coronary artery bypass grafting
CDRIE	cardiac device related endocarditis
CI	confidence interval
CIED	cardiac implantable electronic devices
CIEDIE	See CDRIE
Cm	centimeter
COPD	Chronic Obstructic Pulmonary Disease
CT	Computed Tomography
CTA	Computed Tomography Angiography
DNA	desoxyribonucleic acid
DRI	driveline related Infections
DT	decision tree (a machine learning model)
EANM	European Association of Nuclear Medicine
EARL	European Association of Nuclear Medicine Research Ltd.
e.c.i	of unknown cause (Latin: e causa ignota)
ECG	electrocardiogram
<i>E. cloaca</i>	<i>Enterobacter cloaca</i>
<i>E. coli</i>	<i>Eschereria coli</i>
<i>E. faecalis</i>	<i>Enterococcus faecalis</i>
<i>E. faecium</i>	<i>Enterococcus Faecium</i>

e.g.	for example (Latin: <i>exempli gratia</i>)
eGFR	estimated glomerular filtration rate
EMC	Erasmus Medical Center
Endocarditis	In this thesis this term refers to Infective endocarditis
EV	ensemble voting classifier (a machine learning model)
ESC	European Society of Cardiology
Et al	and others (Latin: <i>et alii</i>)
F	female
¹⁸ F	fluor-18 (A radioisotope of Fluor)
[¹⁸ F]FDG PET/CT(A)	[¹⁸ F]fluorodeoxyglucose with low-dose computed tomography (or contrast enhanced computed tomography angiography)
FOV	field of view
FP	false positive
GT	Giorgio Treglia
Gram	Gram staining
HACEK	<i>Haemophilus</i> species, <i>Aggregatibacter</i> species, <i>Cardiobacterium hominis</i> , <i>Eikenella corrodens</i> , and <i>Kingella</i> species
HFLC diet	high fat, low carbohydrate diet
H. parainfluenza	Haemophilus parainfluenza
IBM	International Business Machines Corporation
ICD(s)	implantable cardioverter defibrillator(s)
i.e.	that is (Latin: <i>id est</i>)
IE	infective endocarditis
IQR	interquartile range
ISCVID	International Society of Cardiovascular Infectious Diseases
IV	intravenous
i.v.m.	in verband met (Dutch): because
kg	kilogram
<i>K. Oxytoca</i>	<i>Klebsiella oxytoca</i>
L	liter
LR:	logistic regression
LVAD	left ventricular assist device
M	male
Max	maximum
MBq	Megabecquerel, a unit for radioactivity
<i>M. Chelonae</i>	<i>Mycobacterium chelonae</i>
mCT	multidetector Computed Tomography
MDE2015	Modified Duke criteria, 2015 version as proposed by the European Society for Cardiology

METc	Medisch Ethische Toetsingscommissie (Dutch): ethical review board
MIC	minimum inhibitory concentration
mL	millilitre
MLM	machine learning models
MRI	magnetic resonance imaging
MRSA	Methicilin Resistant <i>Staphylococcus aureus</i>
μ tot	Mean total administered activity
MV	mitral Valve
MVR	mitral valve replacement
MVP	mitral valvuloplasty
n	number of patients
NAC	non-attenuation corrected
n.a.	not applicable
NB	the following requires extra attention (Latin: nota bene)
NG	Non-gated
NLR	negative likelihood ratio
NPV	negative predictive value
NR	not reported
NVE	native valve endocarditis
OR	odds ratio
P	Prospective
p	probability value
<i>P. aeruginosa</i>	<i>Pseudomonas aeruginosa</i>
<i>P. mirabilis</i>	<i>Proteus mirabilis</i>
PABA	para-aminobenzoic acid
PCR	polymerase chain reaction
PET	Positron Emission Tomography
PLR	positive likelihood ratio
PM	pacemaker
PPV	positive predictive value
PRISMA-DTA	Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Diagnostic Test Accuracy
PUSH	Partnership of UMCG-Siemens for building the future of Health
PV	Prosthetic valve
PVE	prosthetic valve endocarditis
QUADAS-2	Quality Assisment of Diagnostic Accuracy Studies, second version
R	Retrospective

ROC	receiver operating curve
RS	Riemer H.J.A. Slart
<i>S. aureus</i>	<i>Staphylococcus aureus</i>
SD	Standard deviation
<i>S. dysgalactiae</i>	<i>Streptococcus dysgalactiae</i>
<i>S. epidermidis</i>	<i>Staphylococcus epidermidis</i>
<i>S. hominis</i>	<i>Staphylococcus hominis</i>
<i>S. lugdunensis</i>	<i>Staphylococcus lugdunensis</i>
<i>S. mitis</i>	<i>Streptococcus mitis</i>
16S PCR	Polymerase chain reaction using 16S ribosomal RNA (test to detect bacteria)
SPECT	single photon emission computed tomography
SPECT/CT	single photon emission computed tomography combined with (regular) computed tomography)
spp.	Species
SPSS	Statistical Package for the Social Sciences: an application for statistical analysis
SUV	Standardized uptake value
SUVmax	maximum Standardized uptake value
SUVratio	Standardized uptake value ratio
TAVI	Transcatheter Aortic Valve Implantation
TEE (or TOE)	Tranoesophageal echocardiography
TN	true negative
TTE	Transthoracic echocardiography
<i>T. whipplei</i>	<i>Tropheryma whipplei</i>
UMCG	University Medical Center Groningen
VOI	volume of interes
vs	versus
WBC SPECT/CT	White blood cell single photon emission computed tomography combined with (regular) computed tomography)
WMO	Wet medisch wetenschappelijk onderzoek (Dutch): Dutch law regarding medical research involving human participants
χ^2	Chi-squared test (a statistical test)
XGB	XGboost, a machine learning model

