

Morphology and more: the EQATE digital platform

John Burthem & Jon Sims

EQATE

UK NEQAS Haematology Online

EQA, Training and Education

First case released in December 2018
6 cases completed to date

UK NEQAS
International Quality Expertise

EQATE

UK UK NEQAS for Haematology and Transfusion

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EQATE

UK NEQAS Haematology Online

UK NEQAS for Haematology and Transfusion

Username or email address:

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This site allows you to maintain your account with UK NEQAS for Haematology and Transfusion, and keep track of previous schemes you have participated in.

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UK NEQAS

International Quality Expertise

Major updates since launch:

- Wiki links
- Questionnaire visibility
- Lab Managers' dashboard
- User Manual
- CPD certificate generation
- PayPal – soon....

DM 2019-20 1904DM

16/07/2019 00:00
11/06/2019 23:39

Case is now closed

1904DM

QUESTIONNAIRE

Outline Description

A 65-year old man feeling unwell, presents to the emergency department. Haemoglobin and platelets are normal, but white cell count is raised. For help with the case we have prepared some additional pages in the morphology section see [Click to try our web pages - Follow the link as appropriate](#)

▼ Narrative

If you missed our help pages first time around, they can be accessed from [Lymphocyte morphology](#)

Initial examination of this blood film image shows that the white cells increased in number. The cells have a lymphoid appearance and a more developmental stage. As ever, the cellular background should be looked at first. In this case, the erythrocyte background is not entirely normal with some abnormal forms [R1] and although present the neutrophils [N1] appear reduced in number. Platelets are readily found, but like the erythrocytes may not be entirely normal [P1] or [P2]. These findings point to ill health, however are largely non-specific and do not help distinguish reactive from neoplastic causes.

In this case, examination of the white cells is more informative. The fundamental question is: are the cells neoplastic or reactive? Neoplastic cells often share common features, since they arise from the same abnormal clone. However, the term "common features" should not be confused with "identical appearances". It is important to look for related characteristics of shape, size, nucleus or cytoplasm remembering that even cells with extreme morphological forms may form part of a similar overall spectrum of forms.

Looking at the cells - the chromatin is condensed with no obvious nucleolus, while the cytoplasm has similar mild basophilia - these features are those of a mature developmental stage [L1]. The cells may be assumed to belong to the lymphoid lineage (some quite closely resemble normal circulating lymphocytes - [LN]). In this case, there is clearly quite significant variation of size - a feature often seen in reactive cells. However, if we focus on the nuclear appearance we see a different story; the nuclear form has prominent nuclear lobulation varying from the subtle [L2] and [L3], to obvious [L4], or spectacular [L5], with related nuclear appearances present in most cells on the

+

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4x

10x

20x

40x

60x

Annotation

Title N1

Description

Questionnaire

Annotation

Title N1

Description

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DM Manager
EQATE Manager Dashboard

← → ↻ https://eqate.ukneqash.org/p/eqa/managerdashboard

Digital morphology
Manager dashboard
Purchase
Orders
Laboratory summary
Manage staff
User preferences

Name: Lab Staff Participation Overview REFRESH

Status of participations for lab UK NEQAS Haematology - 9999XX

Dr Haematologist			Last Login:	
Dr HaemReg			Last Login: 24/04/2019 11:18	
DM 2019-20 2002DM	Active	Started: 24/04/2019 11:19		
DM 2019-20 1904DM	Active	Started: 24/04/2019 11:19		
DM 2019-20 1905DM	Active	Started: 24/04/2019 11:19		
DM 2019-20 1906DM	Active	Started: 24/04/2019 11:19		
Ms HaemManager			Last Login: 27/03/2019 11:53	
Mr HaemSenior			Last Login: 11/06/2019 09:37	
DM 2019-20 1903DM	Complete	Started: 11/06/2019 09:37	Case submitted: 11/06/2019 10:10	Questionnaire submitted: 11/06/2019 10:10
Mr HaemBMS1			Last Login: 11/03/2019 11:04	
DM 2018-19 1903DM	Active	Started: 07/03/2019 18:14		
Ms HaemBMS2			Last Login: 11/07/2019 11:45	
DM 2018-19 1902DM	Active	Started: 23/01/2019 14:52		
DM 2018-19 1901DM	Active	Started: 23/01/2019 14:52		
DM 2018-19 1805DM	Complete	Started: 23/01/2019 14:52	Case submitted: 04/03/2019 21:04	Questionnaire submitted: 04/03/2019 21:04
DM 2019-20 2002DM	Active	Started: 04/04/2019 12:49		
DM 2019-20 1904DM	Active	Started: 04/04/2019 12:49		

Manager dashboard

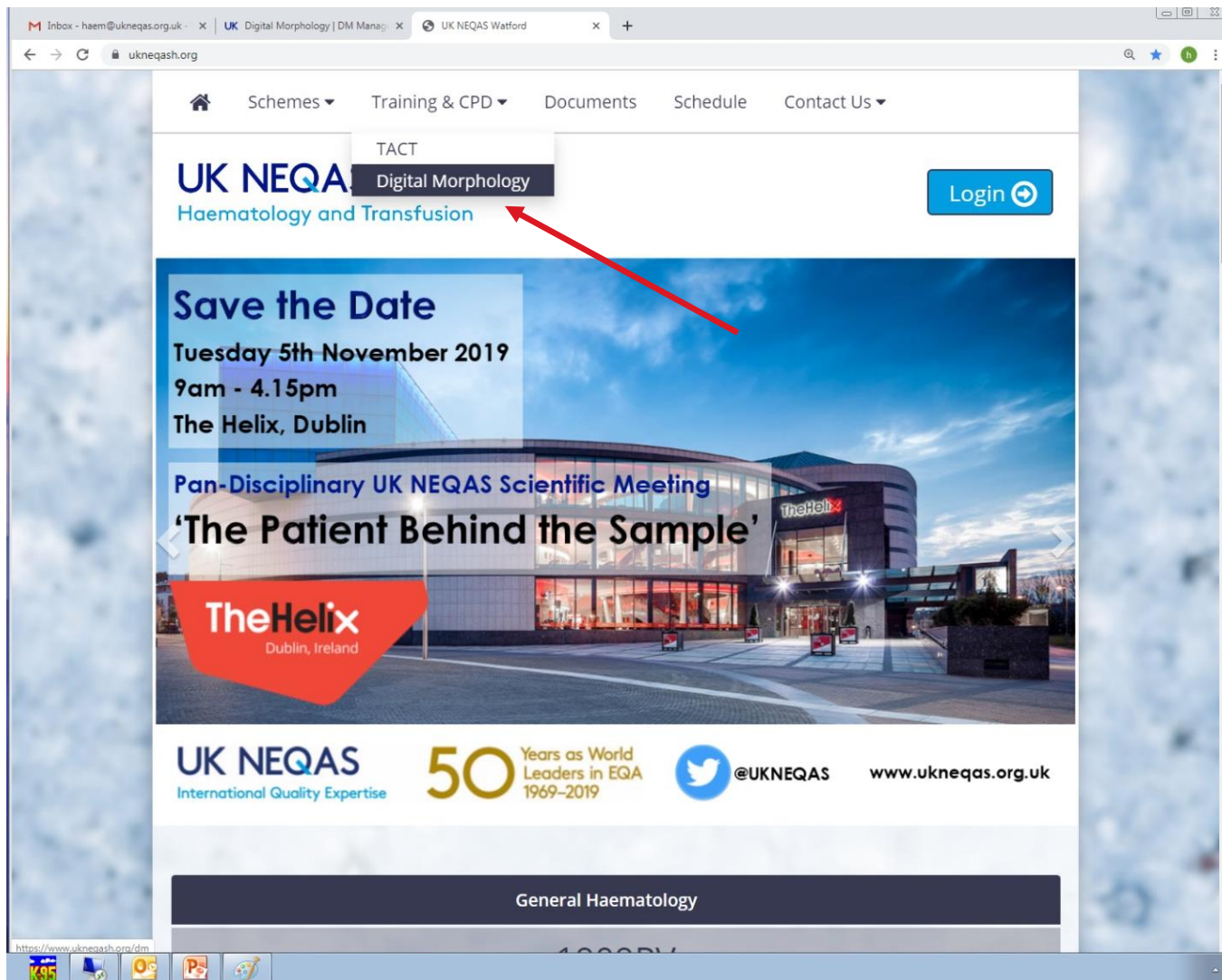
EQATE

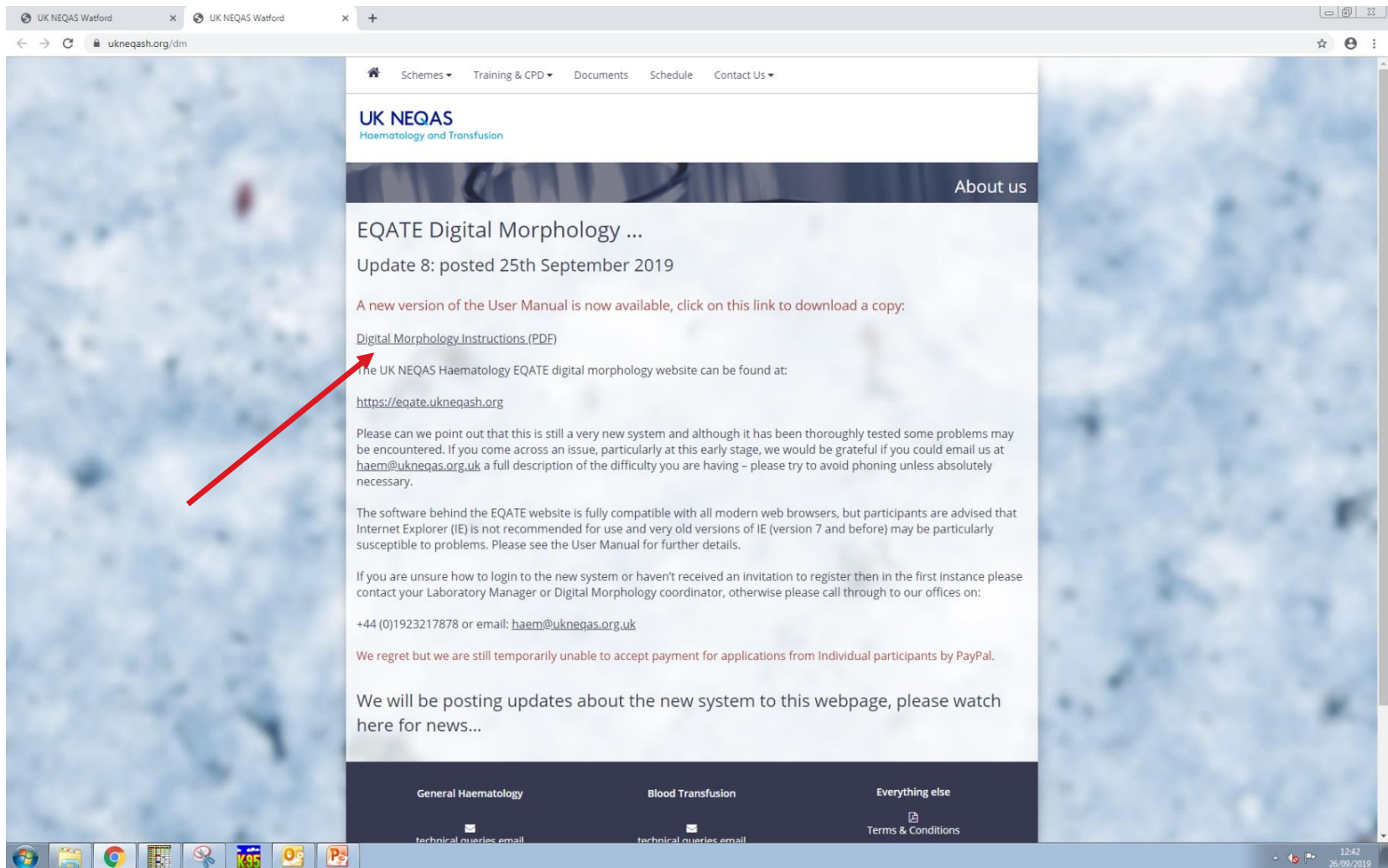
UK NEQAS Haematology Online

Digital Morphology CPD Module User Guide



**User guide available
to download.....**





User survey – UK NEQAS Haematology EQATE

- ▶ April 2019 ~ ‘surveymonkey’
 - ▶ 314 Total Responses

User survey - April 2019

Q1: Are you based in the UK?

80%

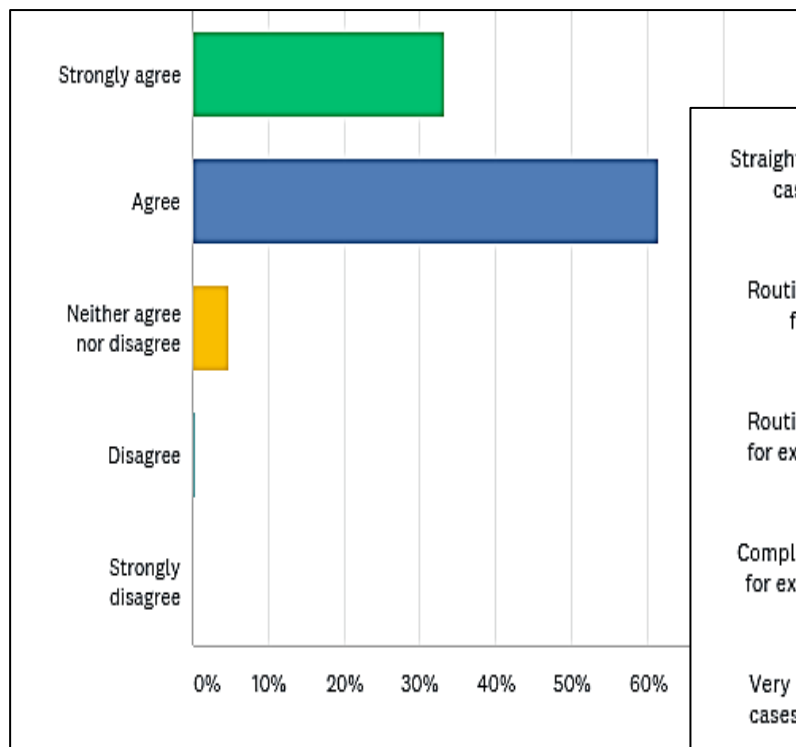
Q2: Are you a Laboratory scientist, Haematology clinician, Academic, or Other?

87% Lab scientist, 10% Clinician

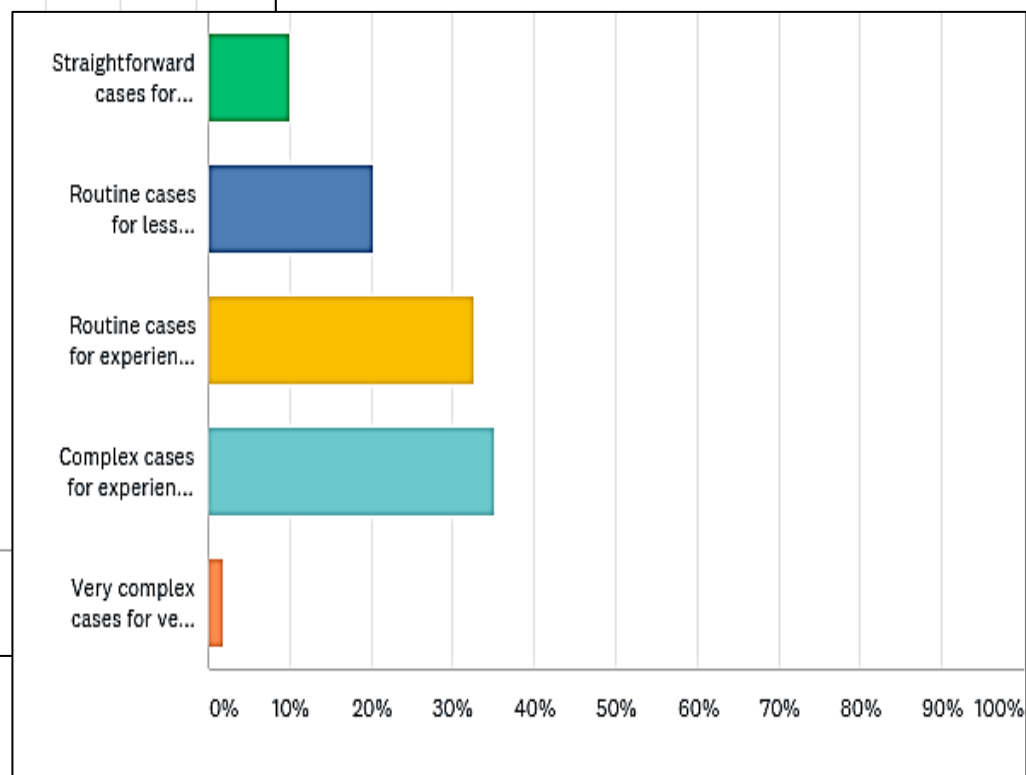
Q3: How long have you been participating in the UK NEQAS Haematology Digital Morphology scheme?

33% > 5 years, 22% < 1 year

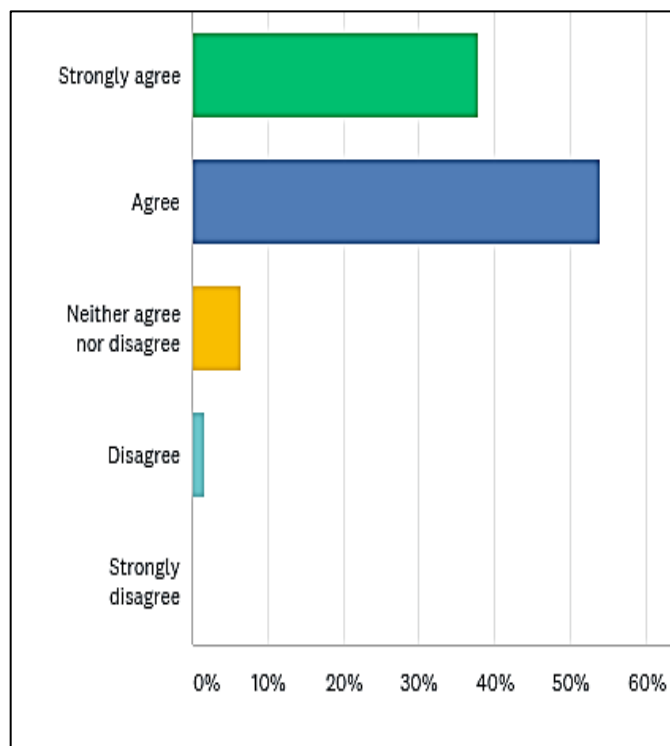
Q12: Did you find the content of the cases published so far, interesting and educational?



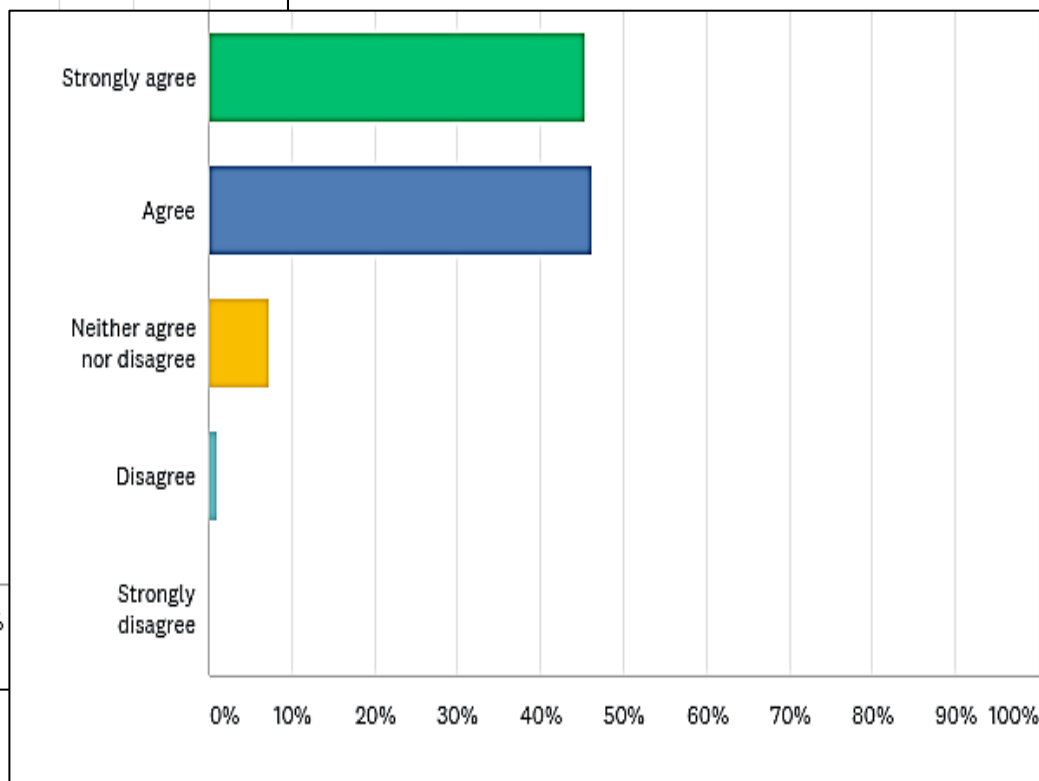
Q13: Would you like to see more examples of straightforward haematological conditions or would you like to see more complex cases?



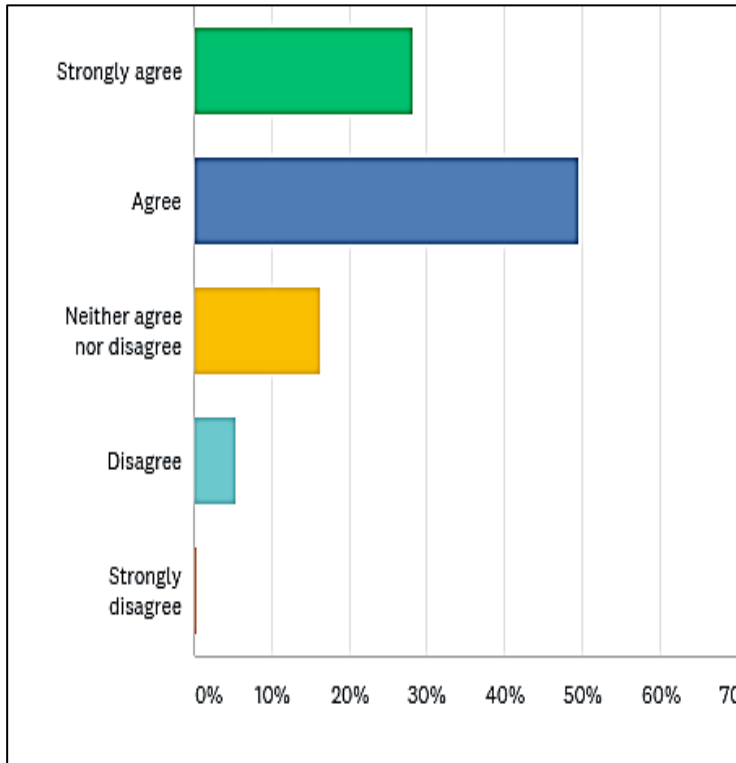
Q14: If a module for Interpretive Cases was included for general haematology, that might be used for CPD or competency, would you find it useful?



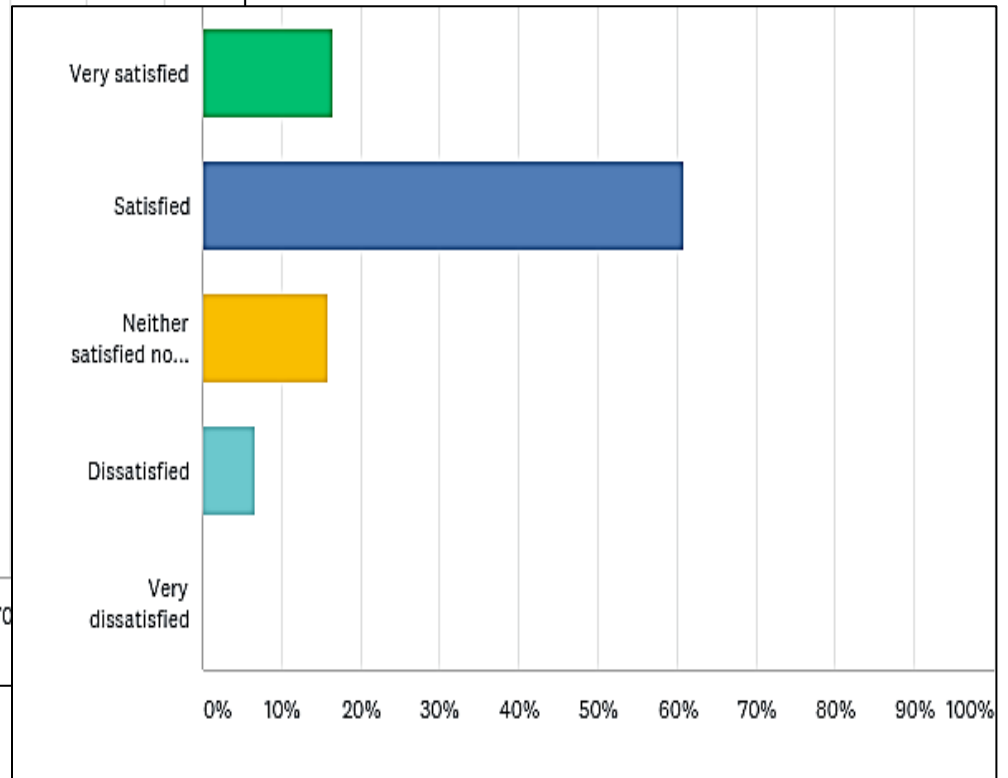
Q15: Would you like modules for on-line learning included in the EQATE platform?



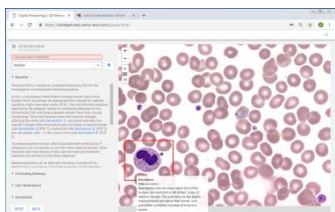
Q16: Would you be prepared to view analyser plots, film images and other material for the UK NEQAS EQA surveys on the EQATE platform?



Q18: How satisfied are you with the new EQATE platform overall?



Morphology module:



EQA module:

Electronic EQA cases
'Dry' cases

Interpretive EQA module:

Case studies

Individual assessment

Competency assessment

Education module:

Galleries

Self-assessment tools



Contents lists available at [ScienceDirect](#)

EBioMedicine

journal homepage: www.ebiomedicine.com



Research Paper

Do We Know Why We Make Errors in Morphological Diagnosis? An Analysis of Approach and Decision-Making in Haematological Morphology



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^c School of Healthcare Sciences, Manchester Metropolitan University, John Dalton Building, M1 5GD, UK

^d Institute of Cancer Sciences, 5th Floor St Marys Hospital, University of Manchester, M13 9WL, UK

UK NEQAS
International Quality Expertise

16/07/2019 00:00
11/08/2019 23:59

Case is open

1904DM

QUESTIONNAIRE

Outline Description

A 65-year old man feeling unwell, presents to the emergency department. Haemoglobin and platelets are normal, but white cell count is raised. For help with the case we have prepared some additional pages in the morphology section see [Click to try our web pages - Follow the link as appropriate](#)

User Observations

Erythrocytes

Leucocytes

Platelets

Various

Observations in order of priority:

Apoptotic cells

Thrombocytosis

SUBMIT

BACK

+

-

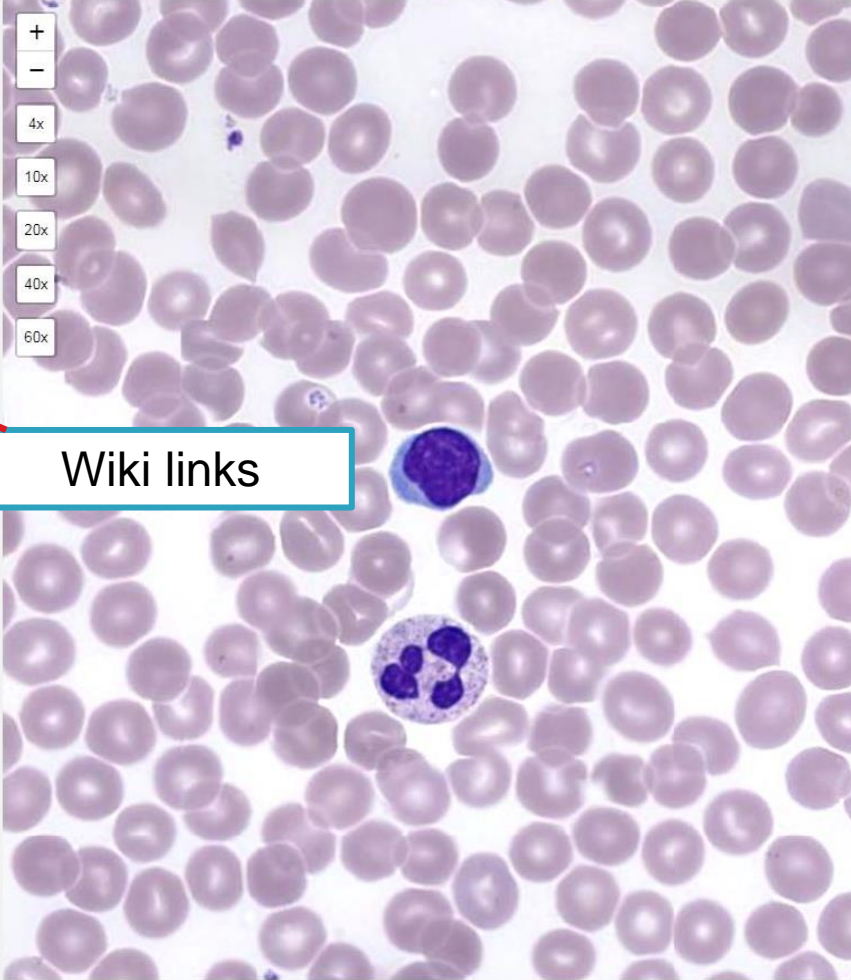
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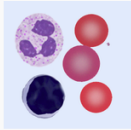





Wiki links

<http://haematologyetc.co.uk>

Manchester Haematological Cancers Diagnostic Partnership

From www.haematologyetc.co.uk
(Redirected from [Main Page](#))

Diagnostic support

					
BLOOD CELL MORPHOLOGY	PARASITE MORPHOLOGY	FLOW CYTOMETRY	MOLECULAR GENETICS	CYTOGENETICS	FOR PATIENTS

This page was last modified on 26 September 2019, at 16:21.

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[Disclaimers](#)

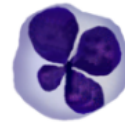
<http://haematologyetc.co.uk>

www.haematologyetc.co.uk [Return to Home](#) [Search](#) [Settings](#) [User](#)

Mature T and NK cell disorders

From www.haematologyetc.co.uk


[Actions](#)



Adult T cell Leukaemia Lymphoma (ATLL)

The abnormal cells generally have a range of size and appearances. The most characteristic feature is probably the nuclear shape that may appear as a convoluted or folded form, or may be spread out with a "clover leaf" appearance (generally only a minority of cells have clover leaf nuclei).

[Click for detailed description](#)



Sézary cells

In this instance the very complex nuclei have a folded shape - the "cerebriform" appearance that is said to resemble the surface of the brain. This appearance may require careful scrutiny to detect. Size, shape and nuclear chromatin can be quite variable even within a single blood film.

[Click for detailed description](#)

<http://haematologyetc.co.uk>

Malaria species recognition - www. X

haematologyetc.co.uk/Malaria_species_recognition

Most Visited http://localhost:8901/L... https://m.ukneqash.co... UK NEQAS Watford UK NEQAS Watford 5 User Role based Authe...

www.haematologyetc.co.uk Return to Home Search www.haematolog Search

Malaria species recognition

From www.haematologyetc.co.uk

Actions

SUMMARY PAGE

Plasmodium falciparum

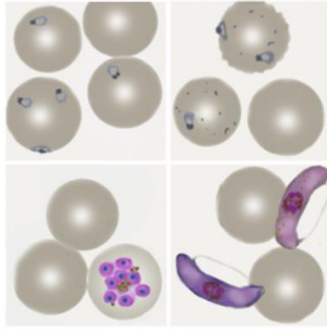
Brief Summary

- Small fine ring forms with certain characteristic forms
- Rings have relatively uniform appearance
- Maurer's dots and clefts in late trophozoites
- Schizonts very rarely seen
- Characteristic elongated (often curved) gametocytes

More

[click for full description](#)

[click for gallery of forms](#)



Plasmodium vivax

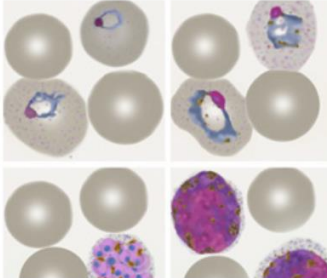
Brief summary

- Large robust rings that becoming amoeboid during later development
- Red cells become increasingly enlarged and distorted
- Schüffner's dots present in appropriately stained samples
- All forms tend to circulate with large schizont and gametocyte forms

More

[click for full description](#)

[click for gallery of forms](#)



Windows Taskbar: css, css, laravel.log, RoleTableSe..., CheckRole..., Internet Inf..., MINGW64/, MINGW64/, Sticky Notes, User Role b..., Malaria spe..., Microsoft S..., 08:34 03/10/2019

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Red Cell Morphology

From www.haematologyetc.co.uk

(Click the image to link to the page)

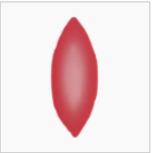



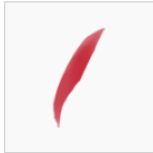
[Actions](#)

Abnormal erythrocyte maturation, size or haemoglobin content



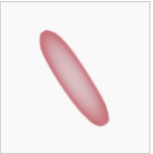
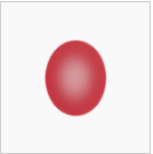


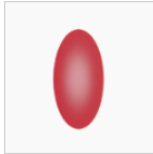
Nucleated erythrocytes *Polychromatic cells* *Macrocytes* *Hypochromic microcytes*

Abnormal shapes with irregular or sharp-ended form



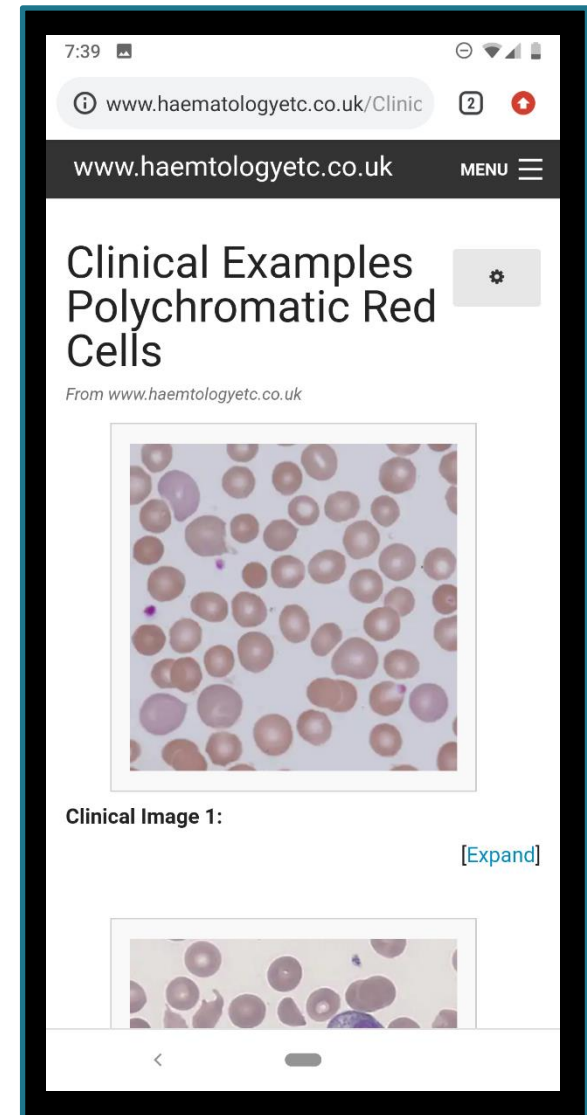
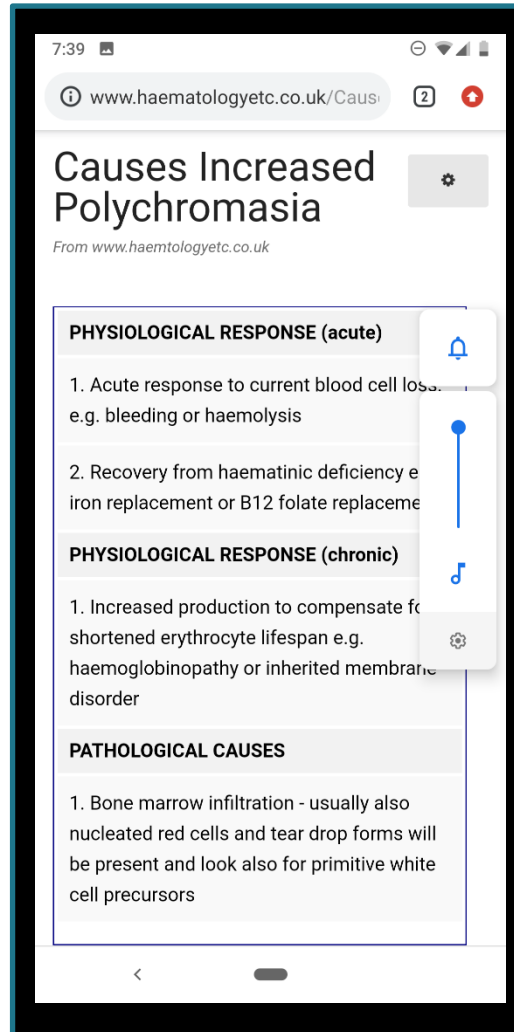
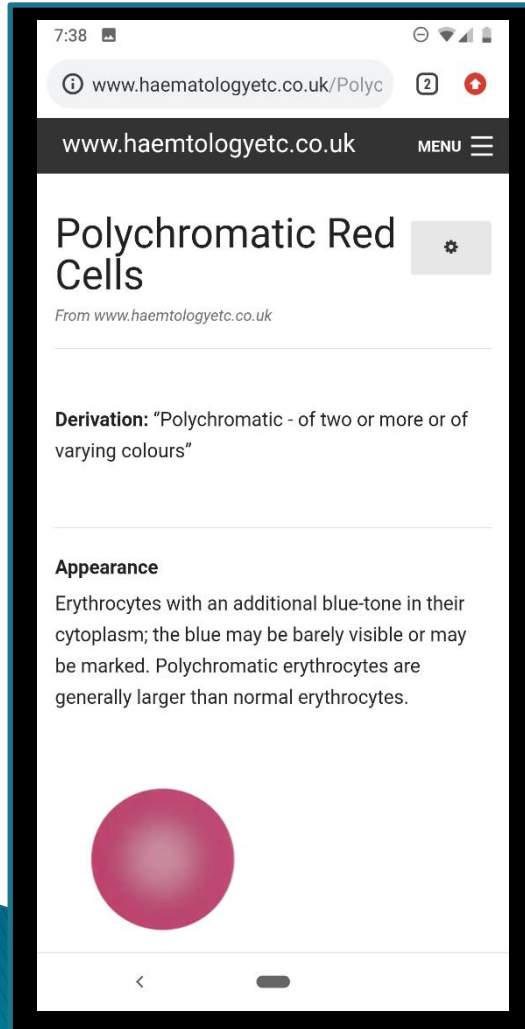
Sickle cells (drepanocytes) *Tear drop cells (dacryocytes)* *SC poikilocytes* *Irregularly contracted cells* *Boat-shaped cell*

Abnormal shapes with regular form



Elliptocytes *Spherocytes* *Microspherocytes* *Ovalocytes* *Pencil cell*

Device agnostic (1)

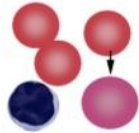


Device agnostic (2)

Cells with altered maturation, size or haemoglobin content

Red cells with these characteristics are frequently encountered in the laboratory. None indicates a single specific diagnosis and diagnosis often requires consideration of additional features:

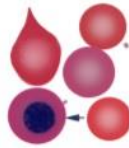
Polychromatic cells: look for the blue tinge of the cytoplasm, often also increased size



These are cells released into blood at early stages of maturation and are normal blood constituents. When numbers are increased a cause should be sought. Consider causes such as a reaction to red cell destruction or bone marrow infiltration: other features of the blood film are important.



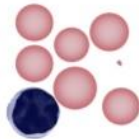
Nucleated red cells: nucleated cells cytoplasm resembles red cells (with variable blue tinge)



These may sometimes circulate in reactive states, but their presence in blood is significant. Context is very important - look particularly for signs of reduced red cell survival or of bone marrow infiltration. Very early forms with basophilic cytoplasm may be a challenge to recognise.



Microcytes: Recognised by their reduced size (smaller than the nucleus of a small lymphocyte)



Microcytic cells are generally also hypochromic and in clinical practice they almost always indicate either iron deficiency or thalassaemia (although rare causes are recognised). It is often not possible to distinguish between these causes in mild cases although there are morphological clues.



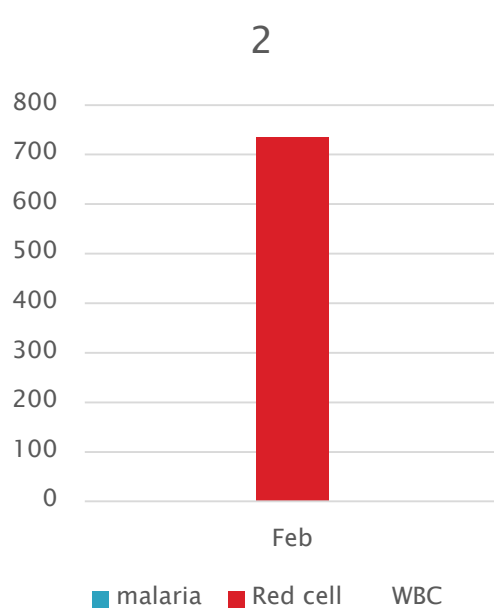
Macrocytes: Recognised by their increased size (larger than the nucleus of a small lymphocyte)



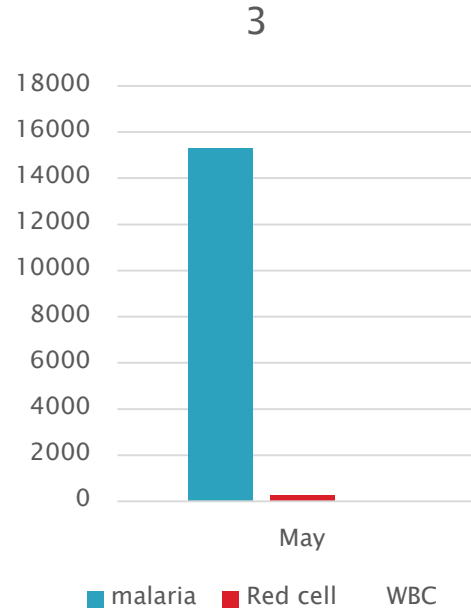
Macrocytes are a diagnostically challenging group - arising in a range of conditions (including nutritional, metabolic, inherited or neoplastic causes). The degree of macrocytosis can be a valuable indicator as very large forms have a limited range of causes - consider also the context.



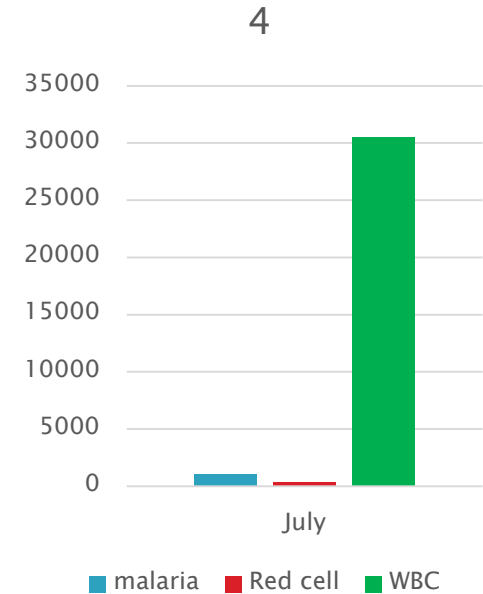
Is the system used?



G6PD



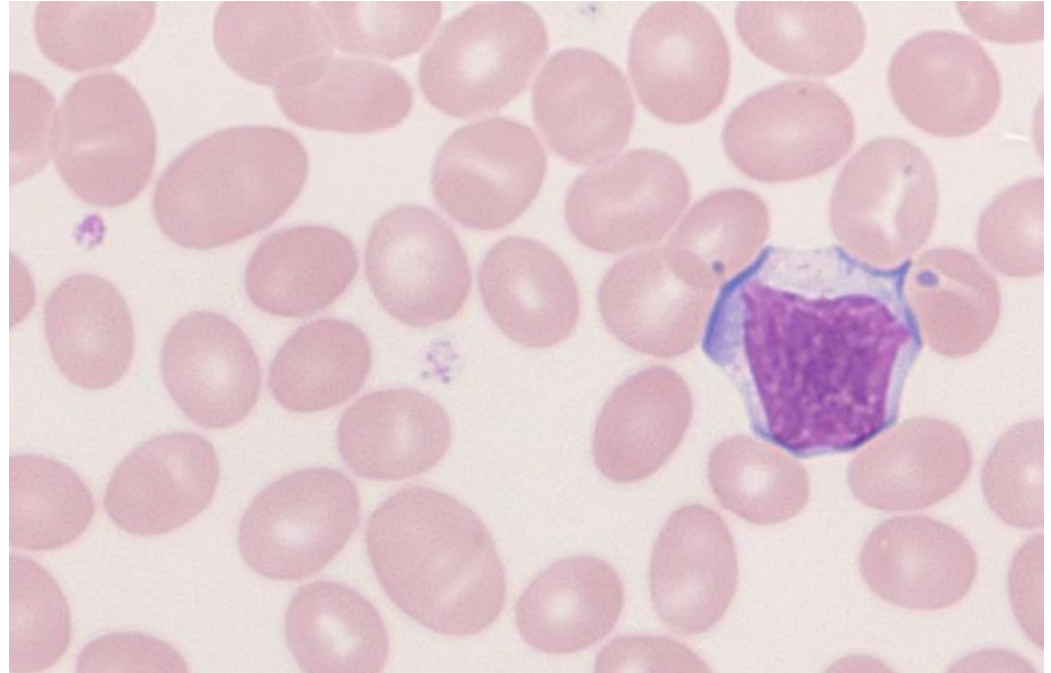
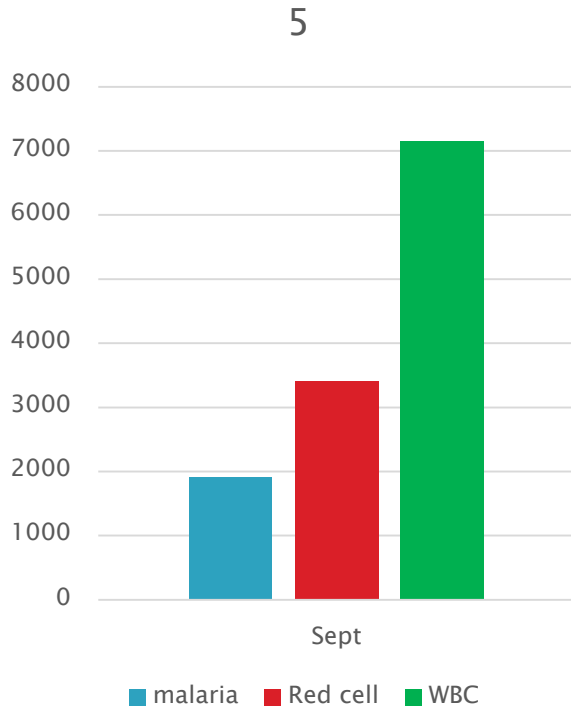
P.malariae



Sézary syndrome

Does the system help?

Most recent case EBV infection & SEAO



Does the system help?

Most recent case EBV infection & SEAO

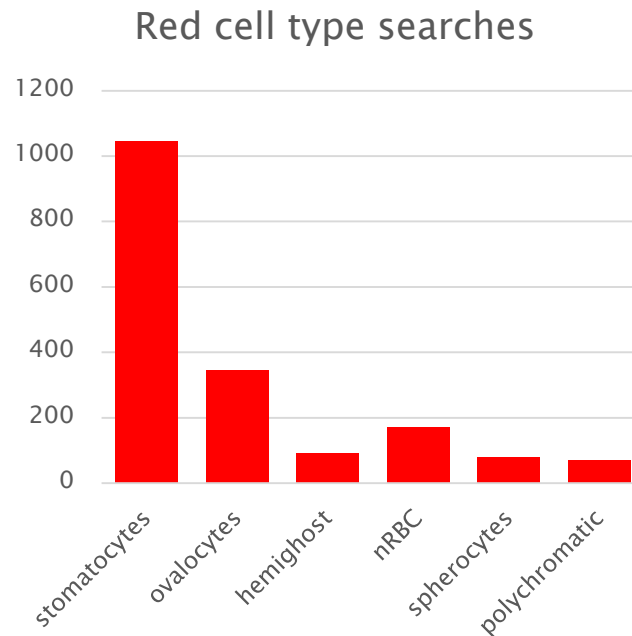
Correct white cells – 87%

Correct – red cells 18%

SEAO	244
liver	178
Hstom	79
HE	39
B12	26
desc	559
nil	201

Does the system help?

	2019	2014	
Correct white cells	87%	89%	
Correct – red cells	18%	7%	$P < 0.001$



Morphology Champions 2019



King's Mill Hospital, Nottingham
Charing Cross Hospital, London
Northwick Park Hospital, Harrow
Queen Elizabeth Hospital, Woolwich
Poole Hospital, Dorset
Queen's Hospital, Romford
Whittington Hospital, London
Royal Marsden, Sutton
Royal Berkshire Hospital, Reading



Thanks for your honesty!

