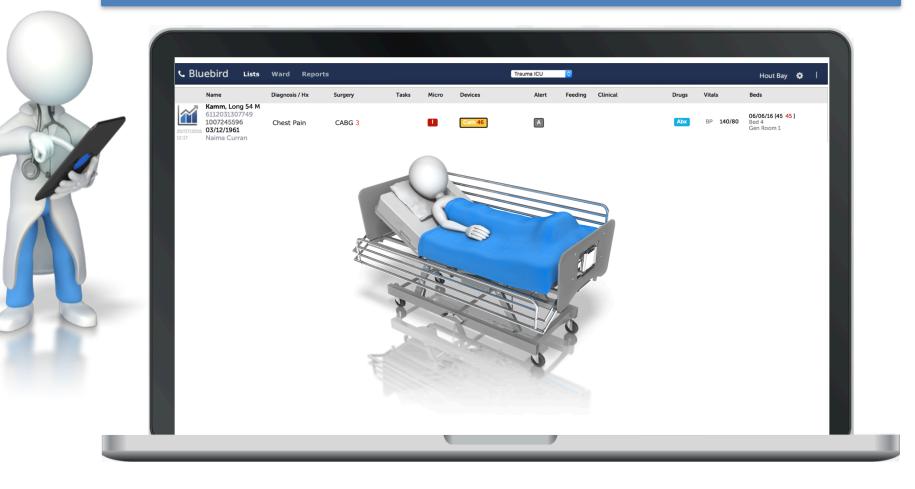
# Bluebird

## Electronic Medical Record (EMR)



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#### Introduction

The Bluebird electronic medical record (EMR), is a systematized digital collection of patient health information that facilitates optimal management of inpatients. Bluebird is a comprehensive clinical EMR designed to complement a hospital billing system and may include a range of data, including demographics, medical history, medication and allergies, immunization status, laboratory test results, radiology images, vital signs, and personal statistics such as age and weight.

Bluebird is best suited for hospitals that already have a billing solution and require an effective means to manage clinical information so as to optimize the efficiency of clinical staff.

The successful implementation of Bluebird, at scale, over the last 10 years in more than 70 large hospitals and 200 ICUs has demonstrated the robustness of the underlying technology and more specifically the following features that are at the core of the Bluebird EMR:

- 1. Minimal impact on hospital IT resources (both personnel and machine)
- 2. Data Security Confidentiality of patient information
- 3. System stability
- 4. Data integration with existing hospital systems and multiple disparate laboratory information systems
- 5. Intuitive Graphic User Interface that enhances clinical efficiency.

#### **Overview**

Bluebird's Ward White Board is the spine of the EMR. It is an intuitive interface on which all relevant patient information is hung and on which new information may be quickly added.

Glueb	Dird Lists Ward R	eports				СТ	ICU 📀					Hout Bay 💠   વ
Cardio	Thoracic Intensiv											
20/07/201	Name Wadkins, Tea 1 F 1507109043033 1007400697 10/07/2015 5 Sibonglie Radebe	Dx / PMHx	Surgery	Tasks WL	D	Infective	Devices	Alert	Feeding	Clinical	Drugs Vitals	Beds 18/07/2016 [3 2 ] Bed 4 Gen Room 1
06:01	Kolodziej, Sora 0 M 1603229728681 1006911797 22/03/2016	A Atrioventricular septal defect	Other major/ Sternotomy for B-T shunt 128, Other major/ Diaphram Philactom 51,	WL	D-		Cath 129 CAUTI	A		CF CM N	Abx	10/03/2016 [133 132 ] Bed 5 Gen Room 1 CRE IP
20/07/201	McCluskey, Maria 0 F 1606229849239 1007297097 22/06/2016 Avery Pumphrey	A Atresia of aorta	Other major/ Sternotomy for repair interupted aortic arch, VSD closure ASD,PDA 10 More	WL	D	BSI		A			Abx	21/06/2016 [31 29 ] Bed 5 Gen Room 1
20/07/201	Simone, Malea 0 F 1604206976710 1007281934 20/04/2016 Teodora Maxham	A	Other major/ TEE, Sternotomy 35 ,	WL	₽.	LRI SST BSI		Δ		N 15	Abx	16/06/2016 [35 34 ] Bed 5 Gen Room 1 IS CRE IP
20/07/201/ 09:41	Naicker, Noya 0 F 1508215962037 1007369911 21/08/2015 Sibongile Radebe	A			□-						Abx	10/07/2016 [11 11 ] Bed 6 Gen Room 1
20/07/201/	Sithole, Roni 0 F 1606264348715 1007255824 26/06/2016 Thora Brosnan	A Patent ductus arteriosus			D-	LRI		A		N	Abx	09/06/2016 [43 43 ] Bed 6 Gen Room 1 IP
20/07/201	Tetreault, Sadia 0 F 1601012533382 1007383629 01/01/2016 Avery Pumphrey	A Ventricular septal defect	Other minor/ TEE Sternotomy for VSD,ASD,PDA 7 ,	WL	D-						Abx	13/07/2016 [8 14 ] Bed 6 Gen Room 1
	Open Bed										New Cleaning	Gen Room 1 - Bed 7

Each line represents a patient on that specific unit.

Individual patient lines are broken into Sections. Each Section shows specific clinical information (Name, Diagnosis/Hx, Surgery, Tasks, Infections, Drugs...).

Name	Diagnosis / Hx	Surgery	Tasks	Micro	Devices	Alert	Feeding	Clinical	Drugs	Vitals	Beds
Kamm, Long 54 M 6112031307749 1007245596 03/12/1961 12:17 Naima Curran	A	CABG 15			Cath 46 CAUTI	A			Abx		06/06/16 [45 45 ] Bed 4 Gen Room 1

At a glance one is able to see that this 54 year old male patient is 15 days post op (coronary artery bypass), has a urinary catheter (which has been in place for 46 days), is on 2 classes of drugs (antibiotics and cardiac) and has been in this unit for 45 days. One can also see that the last labs arrived on the 20/07/2016 at 12:17.

Clicking on any section will reveal detail specific for that section. As an example, the following screenshot has the lab section open.

	Name	Diag	nosis / Hx	: 5	Surgery		Tasks	Micro	Dev	vices		Alert	: Fe	eding	Clinical		Dr	ugs	Vitals	Be	ds		
20/07/2016	Kamm, Long 54 I 6112031307749 1007245596 03/12/1961 Naima Curran	M			CABG 15	i		LRI U		ath 46 UTI		A					A	bx		Bee	<b>/06/16 [45</b> d 4 m Room 1	45 ]	
		Kamm, Lo	ng 03/12/19	961 M																			
Test name	Reference	06/06/2016 21:20	07/06/2016 04:00	6 08/06/201 03:30	6 09/06/2016 03:30	03:30	03:40	03:40	03:35	21:15	5 14/06/2010 03:00	6 15/06/2016 03:00	6 16/06/2010 03:05	03:05	5 18/06/2016 03:10	03:05	5 20/06/2016 03:10	5 21/06/2010 05:40	6 22/06/2010 03:35	6 23/06/201 03:35	16 23/06/2010 15:00	6 24/06/201 03:30	16 25/0 04:0
CHEM																							
Sodium	136 - 145 mmol/l	142	138	141	139	132 # L	136	135 L	136		131 L	130 L	134 L	133 L	132 L	133 L	132 L	130 L	131 L	132 L		131 L	131
Potassium	3.5 - 5.1 mmol/l	3.7	2.3 #*L	4.1 #	3.8	3.9	4.0	4.2	3.8		4.1	4.0	4.2	4.4	4.5	4.7	4.4	4.3	4.8	4.3		4.5	4.2
Chloride	98 - 107 mmol/l	101	99	109 H	108 H	100	101	99	95 L		92 L	90 L	92 L	91 L	92 L	91 L	92 L	91 L	93 L	92 L		93 L	92 L
									-												_	_	_

The Bluebird EMR is comprehensive with modules for nurses, physicians, case managers and ancillary medical staff. Admissions, discharges, readmissions, patient days, days of therapy, mortality etc. etc. are all available in real time. Outcome reporting helps hospitals manage the most appropriate use of scarce resources. Bluebird eICU helps minimize the errors that typically occur in about 1% of iCU patients, often with disastrous outcomes.

The following pages show screenshots aimed to demonstrate some of the powerful features available for hospitals using the Bluebird EMR.

#### **Risk Assessment**





## Early Warning System

Bluebird promotes integrated, **systemlevel improvements,** within your hospital to help ensure patient safety. Bluebird's EWS uses the proven British Royal College of Physicians NEWS (National Early Warning) scoring system to save lives.



Fewer

Falls



### Fewer Pressure Sores

Bluebird screens patients at risk and then proactively manages that risk to help reduce the incidence of bed sores in Bluebird enabled hospitals.



### Fewer Infections

The combination of **advanced antibiotic stewardship** (rather than simple ADE avoidance) and **proactive infection prevention**, *within the same system* is key to Bluebird's success in measuring, and then driving down HAIs and MDROs. More detail can be found on Bluebird's separate antimicrobial stewardship site at www.intelms.com

Bluebird is designed to manage risk by collecting data and then, depending on the data collected prompt repeat risk assessment at appropriate times.

#### Early Warning System (EWS)

Once vitals signs are digitalized they can be evaluated continuously. Bluebird algorithms produce real time early warning scores and, depending on that score, prompt and guide nursing staff to take proactive steps that have been proven to significantly reduce mortality. The AVPU score is an important component of the EWS. In the next image the EWS score is 13 and the tool tip explains that the User should click the score to view the "Clinical Response Checklist" (suggested future frequency of vitals is also set – in this case q1 hr.) Scores are colour coded to give a visual indicator of urgency.

Bluebird IHS							_				Houtbay 🌣 丨
Name	Diagnosis / Hx	Surgery	Tasks	Micro	Devices	Alert	Feeding	Clinical	Drugs	Vitals	Beds
Metz, Harry 53 / 6202218027155 1006637638 21/02/1962				٠		A	NPO		Abx	<b>q 1 hrly</b> P 40 BP 90/60 RR 17 Wt 88	<b>30/12/15 [30 29]</b> Bradman Unit Bed 6 Bradman Unit

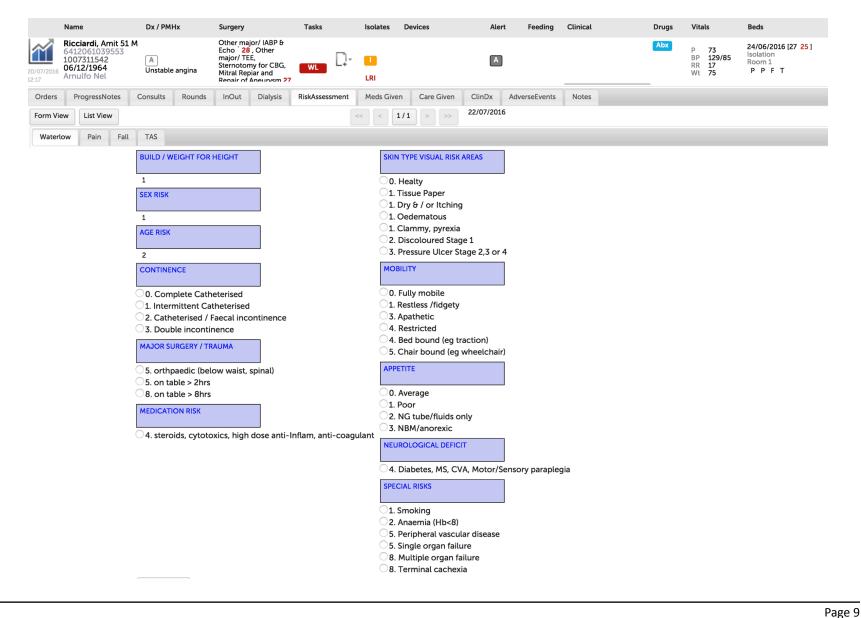
Clicking the EWS score in this case shows the "Clinical Response Checklist":

Metz, Harry 53 M - Clinical Response checklist to	EWS 13 at 29/01/2016 2	20:20
Emergency assessment by a clinical team with include a practitioner/s with advanced airway		icies which also
Consider transfer of clinical care to a level 2 o	or 3 care facility, i.e. high	er dependency or
In progress notes record urine output over last 4	hrs and do Pain score	
	Complete	Cancel

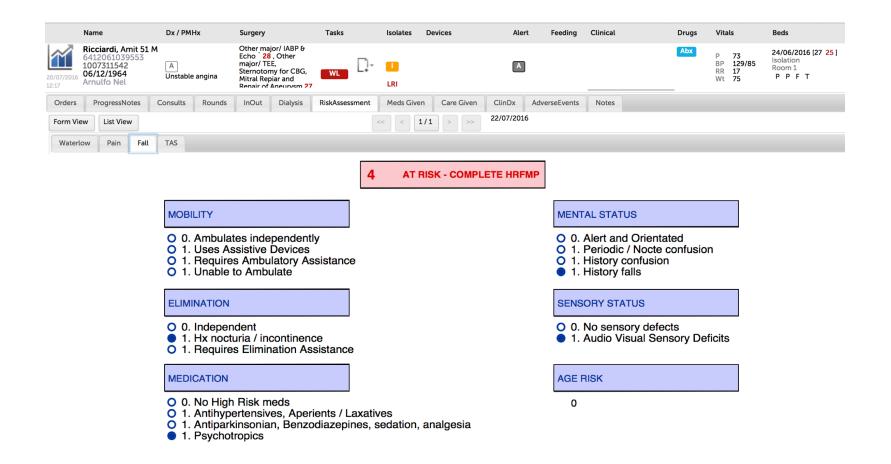
The Bluebird EWS is based on the Royal College National Early Warning Score.

Detail can be found at this URL: <u>http://tfinews.ocbmedia.com/domains/ocbmedia.com/tfinews/data/news\_score.pdf</u>

#### **Risk of Pressure Sores**



#### **Risk of Falling**



#### **Fluid Balance Chart**

Bluebird automates the arithmetic making fluid balance easy and accurate to chart.

6412061 1007311: 06/12/15 Arnulfo I Orders Progre	1964 o Nel ressNotes st View	A	Rounds	Echo major/ Sternot Mitral R Renair d	comy for CBG Repiar and of Aneurysm Mo	i, Wi 27 pre	ssessme		L RI Meds Giv		e Given	ClinDx		eEvents	Note	es		Abx	P BP RR Wt	17	Isolati Room PP		7 <mark>25</mark> ]
Form View List 	st View		INP		Dialysis	RiskA					e Given	ClinDx	Advers	eEvents	Note	es							
7 - 8 a.m. 8 - 9 a.m. 9 - 10 a.m. 10 - 11 a.m.		escription IV		UT				<<	<	1/1													
7 - 8 a.m. 8 - 9 a.m. 9 - 10 a.m. 10 - 11 a.m.		escription IV		UT				<<	<			22/07/20	16										
7 - 8 a.m. 8 - 9 a.m. 9 - 10 a.m. 10 - 11 a.m.		escription IV		UT						1/1 >	>>												
7 - 8 a.m. 8 - 9 a.m. 9 - 10 a.m. 10 - 11 a.m.		escription IV	tion				1	BALAI	NCE F	ROM PR	EVIO	US DAY	0 ML				(	ουτρυ	Т				
8 - 9 a.m. 9 - 10 a.m. 10 - 11 a.m.			IV Description	Meds	Meds Description	Total Enteral	Total IV	Total Meds	Total	Accumulative Intake	Urine	Urine Analysis	Vomitious	Aspirate	Dylasis	Bleeding	Stool	Stool Description	Drain	Drain Description	Total Drain	Total	Accumulative Output
9 - 10 a.m. 10 - 11 a.m.						0	0	0	0	0											0	0	0
10 - 11 a.m.						0	0	0	0	0											0	0	0
						0	0	0	0	0											0	0	0
11 - 12 noon						0	0	0	0	0											0	0	0
						0	0	0	0	0											0	0	0
12 - 1 p.m.						0	0	0	0	0											0	0	0
1 - 2 p.m.						0	0	0	0	0											0	0	0
2 - 3 p.m.						0	0	0	0	0											0	0	0
3 - 4 p.m.						0	0	0	0	0											0	0	0
4 - 5 p.m.						0	0	0	0	0											0	0	0
5 - 6 p.m.						0	0	0	0	0											0	0	0
6 - 7 p.m.						0	0	0	0	0											0	0	0
7 - 8 p.m.						0	0	0	0	0											0	0	0
8 - 9 p.m.						0	0	0	0	0											0	0	0
9 - 10 p.m.						0	0	0	0	0									L		0	0	0
10 - 11 p.m.						0	0	0	0	0									L		0	0	0
11 - 12 p.m.						0	0	0	0	0											0	0	0
12 - 1 a.m.						0	0	0	0	0											0	0	0
1 - 2 a.m.						0	0	0	0	0											0	0	0
2 - 3 a.m.						0	0	0	0	0											0	0	0
3 - 4 a.m. 4 - 5 a.m.						0	0	0	0	0											0	0	0

#### elCU

Bluebird's eICU not only allows traditional ICU flow charts to be digitalized, but once in digital format they can be monitored remotely. Imagine being able to centrally monitor all the ICUs in a hospital group and get central real time alerts that improve local care.

	Name		Dx	/ PMHx		Surgery	/		Tasks		Isolates	Device	es		Alert	Feed	ing C	linical		Dri	ugs	Vitals		Beds	
	Ricciardi, 4 64120610 100731154 06/12/196 Arnulfo Ne	39553 12 4	A	stable ar	ngina	major/ Sternot Mitral R	najor/ IAB 28 , Othe TEE, omy for C epiar and of Aneury	CBG,	WL	D.	LRI				A					A		P 73 BP 129 RR 17 Wt 75		24/06/201 Isolation Room 1 P P F	
Alarms	Table	Graph								<	< <	1/1	> >>												
Gen	Cardiac	Resp	Ne	uro																					
		7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	5	6
	Duthurs																								
	Rythym MAP																								
	CVP																								
	Perfusion																								
	Skin Color																								
	st Pain /10																								
	A Pressure																								
Cardia	ac Output																								
	PAS/SV																								
	PAD/CI																								
P	ulm.Mean																								
SV	/R/Wedge																								
	SVRI																								
	со																								
P	acemaker																								
Asvnc	c/Demand																								
	Rate																								
	Pacinq																								
IAE	BP PumpR																								
Auqr	mentation																								
Per	rfusion / P																								

## Dialysis

Dialysis documentation is made easy and digitalization facilitates data analysis.

	Name	Dx / PMHx	Surgery	Tasks	Isolates	Devices	Alert	Feeding	Clinical	Drugs	Vitals	Beds
20/07/2016	Ricciardi, Amit 5 6412061039553 1007311542 06/12/1964 Arnulfo Nel	1 M A Unstable angina	Other major/ IABP & Echo 28, Other major/ TEE, Sternotomy for CBG, Mitral Repiar and Repair of Aneurysm 27 More	WL	LRI		A			Abx	P 73 BP 129/85 RR 17 Wt 75	24/06/2016 [27 25 ] Isolation Room 1 P P F T
Orders	ProgressNotes	Consults Rounds	InOut Dialysis	RiskAssessment	Meds Give	en Care Given	ClinDx Ad	verseEvents	Notes			
Form Vie	Ew List View	-			<< <	1/1 > >>	22/07/2016					
New D	vialysis											
Dialysis	s type:	Select ᅌ										
Alarm I	Limits Set	YesONoO				Antico	agulant		Select 🗘	UNIT		
Blood I	Pump speed					Fluid r	emoved				ML	
Dialysa	te Flow rate											
Dialyse	r	Select ᅌ										
Techici	ian's notes	Select										
Signatu	ure	Frida Shows										
Sa	ave											

#### Orders

Bluebird's ordering interface makes CPOE (Computer Physician Order Entry) simple.

	Name	Dx / PMHx	Surgery	Tasks	Isolates	Devices	Alert	Feeding	Clinical	Drug	gs Vi	tals	Beds
20/07/201/ 12:17	<b>Ricciardi, Amit 51 M</b> 6412061039553 1007311542 5 06/12/1964 6 Arnulfo Nel	A Unstable angina	Other major/ IABP & Echo 28, Other major/ TEE, Sternotomy for CBG, Mitral Repiar and Repair of Aneurosm 27 More		LRI		A			Ab	P BP RR	73 0 129/85 R 17 t 75 More	24/06/2016 [27 25 ] Isolation Room 1 P P F T
Orders	ProgressNotes	Consults Rounds	InOut Dialysis	RiskAssessment	Meds Given	Care Given	ClinDx	AdverseEvents	Notes				
Preso	ription Vitals Lal	os XR DNR	Other All										

Fast accurate prescribing helps minimize mistakes. The orders are sent to nurses "todo" list and Bluebird converts a physicians prescription to a precise product dose, eliminating the need for manual calculations.

The following 2 pages show examples of drug ordering and lab ordering (in this example, micro):

Indication Category	UTI O	_	iymptoms or Signs:		10
Drug	Amoxicillin	Ampicillin	]		
Administration Route	IV	Oral	IM	Inhalation	]
	Irrigation	Topical	Vaginal	Rectal	]
Dose Frequency		<ul> <li>Loading</li> <li>O</li> </ul>	mg		
Duration	days	0			
Microbiology Ordered	Yes	No	Unsure		
Ordered	22/07/2016 06:35	dd/mm/yyyy hh:mm			
Save	Cancel				

Collection	25/11/2016	09.30			
Profiles	+ Show				
General	Micr	obiology	Cytology	Histology	
Clinical	Urgent				
	Clinical Info				
	Indication	UTI	Symptoms or s	Signs: Yes	No
	Submit	Cancel			

#### iPad Enabled

Bluebird's EMR is mobile, facilitating care at the bedside.

	Name Kamm, Long 54 M 6112031307749	-	nosis / Hx	: 5	Surgery		Tasks	Micr	o De	vices		Aler	t Fe	eeding	Clinical		Drugs		Vitals	Beds		
	1007245596 03/12/1961 Naima Curran	A						LRI U	_	ath <mark>46</mark> AUTI			3			Abx				<b>06/06/16 [45 45 ]</b> Bed 4 Gen Room 1		
Test name CHEM	Deference	06/06/2016	ng 03/12/19 07/06/2010 04:00		<b>09/06/201</b>	03:30	03:40	5 12/06/201 03:40	6 13/06/201 03:35	6 13/06/20 21:15	16 14/06/20: 03:00	6 15/06/201 03:00	6 16/06/201 03:05	6 17/06/20 03:05	16 18/06/20: 03:10	16 19/06/20 03:05	16 20/06/20: 03:10	16 21/06/20 05:40	03:35	016 23/06/201 03:35	5 23/06/2016 24/06/2 15:00 03:30	2016 25/06 04:00
Sodium	136 - 145 mmol/l 1	142	138	141	139	132 # L	136	135 L	136		131 L	130 L	134 L	133 L	132 L	133 L	132 L	130 L	131 L	132 L	131 L	131 L
Potassium	3.5 - 5.1 mmol/l 3		2.3 #*L	4.1 #	3.8	3.9	4.0	4.2	3.8		4.1	4.0	4.2	4.4	4.5	4.7	4.4	4.3	4.8	4.3	4.5	4.2
Chloride	98 - 107 mmol/l		99	109 H	108 H	100	101	99	95 L		92 L	90 L	92 L	91 L	92 L	91 L	92 L	<b>91</b> L	93 L	92 L	93 L	92 L
CO2 Calcium	22 - 29 mmol/l 2 2.15 - 2.50 mmol/l	28	12 # L	25 #	23 2.05 L	22	24	25	27 2.33 #		27	26	27 2.37	28	26	28	28	27	27	27 2.51 H	27	26
Phosphate	0.78 - 1.42 mmol/l				2.05 L				2.33 # 0.55 # L				1.26 #				1.25			2.51 H		_
Magnesium	0.66 - 1.07 mmol/l				0.76				0.77				1.06 #				0.89 #			0.85		
Anion Gap	8-20 mmol/l	17	29 H	11	12	14	15	15	18		16	18	19	18	19	19	16	16	16	17	16	17
Amylase		30																				
CRP PCT	< 5 mg/l 0.00 - 0.05 ng/ml		12 H	208 #*H	306 #*H	324 *H 5.69 *H	237 #*H 3.03 #*H	169 #*H	97 # H	_	84 H	<b>68</b> H	<b>71</b> H	63 H	57 H	54 H	45 H	<b>46</b> H	39 H	36 H	35 H	<b>30</b> H
Haematolo						5.69 °H	3.03 #*H															
		15.8	15.4	11.8 # L	11.1 L	11.1 L	11.0 L	10.7 L	11.2 L	10.2 L	10.2 L	11.3 L	12.0 L	12.6 L	12.8 L	12.6 L	11.7 L	11.4 L	12.1 L	12.2 L	11.8 L	11.7
Hct	43.0 - 55.0 %	14.2	44.0	34.7 # L	33.1 L	32.1 L	31.4 L	30.8 L	32.4 L		29.2 L	32.2 # L	34.6 L	36.4 L	37.3 L	37.6 L	34.4 L	33.8 L	35.3 L	36.1 L	35.1 L	34.9
RBC	4.89 - 6.11 10^12/14		4.94	3.85 L	3.60 L	3.56 L	3.52 L	3.44 L	3.63 L		3.28 L	3.63 L	3.87 L	4.05 L	4.13 L	4.12 L	3.77 L	3.71 L	3.91 L	4.00 L	3.83 L	3.81
MCV		38.8	89.1	90.1	91.9	90.2	89.2	89.5	89.3	_	89.0	88.7	89.4	89.9	90.3	91.3	91.2	91.1	90.3	90.3	91.6	91.6
MCH MCHC		51.7 55.7	31.2 35.0	30.6 34.0	30.8 33.5	31.2 34.6	31.3 35.0	31.1 34.7	30.9 34.6		31.1 34.9	31.1 35.1	31.0 34.7	31.1 34.6	31.0 34.3	30.6 33.5	31.0 34.0	30.7 33.7	30.9 34.3	30.5 33.8	30.8 33.6	30.7 33.5
Platelets	150 - 450 10^9/l		278	95 # L	85 L	89 L	99 L	111 L	175 #		209	253	318	343	383	415	393	416	482 H	477 H	479 H	459 1
RDW	10.0 - 16.3 % 1	13.8	13.8	14.0	14.3	13.6	13.1	13.2	13.4		13.4	13.5	13.7	13.5	13.9	13.5	13.3	13.1	12.8	13.1	13.4	13.4
WBC	3.92 - 9.88 10^9/l			7.03 #	8.29	7.88	6.64	7.47	11.91 # H		12.50 H	14.55 H	17.84 H	18.54 H		14.08 H	10.36 H	7.23	8.24	10.52 H	8.46	9.38
Neutrophils %		58.3	77.2	78.0	83.8	81.6	73.3	81.1	64.7		67.0	78.5	86.2	85.1	83.0	79.7	74.3	66.4	70.3	74.3	68.5	72.9
Neutrophils Abs	2.00 - 7.50 10^9/l		10.96 # H		6.95	6.43	4.87	6.06	7.71 H		8.36 H	11.42 H	15.36 H	15.77 H		11.22 H	7.70 H	4.80	5.79	7.82 H	5.80	6.84
Eosinophils % Eosinophils		0.5	0.0	0.6	2.1	2.3	1.8	0.4	0.6	-	1.0	1.0	0.7	0.6	0.9	1.1	1.5	2.8	1.5	0.9	1.3	1.8
Abs	0.00 - 0.45 10^9/1		0.00	0.04	0.17	0.18	0.12	0.03	0.07		0.13	0.14	0.13	0.12	0.16	0.16	0.16	0.20	0.12	0.09	0.11	0.17
							-						-				-					
Abs Basophils %		0.3	0.100	0.04	0.1	0.18	0.12	0.03	0.07		0.13 1.1 0.14	0.14	0.13	0.12	0.16	0.16	0.16	0.20	0.12	0.09	0.11 0.4 0.03	0.17

#### Summary

For health facilities that do not require a new billing system, Bluebird's comprehensive EMR offers a practical alternative to high priced foreign EMRs not specifically designed for the South African market.

Bluebird has an enviable track record in South Africa and is backed by a Cape Town based development team that is flexible enough to help your hospital implement in house ideas that you know would be beneficial in your local environment.