

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

**Pemantapan Mutu Internal
Laboratorium Medis
Tahap Analisis-Kontrol Kualitas Numerik
Aturan Wesgard**



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PMI Tahap Analitik – QC Numerik-Aturan Wesgard (2)

Westgard Rules

1_{2s}

R_{4s}

1_{3s}

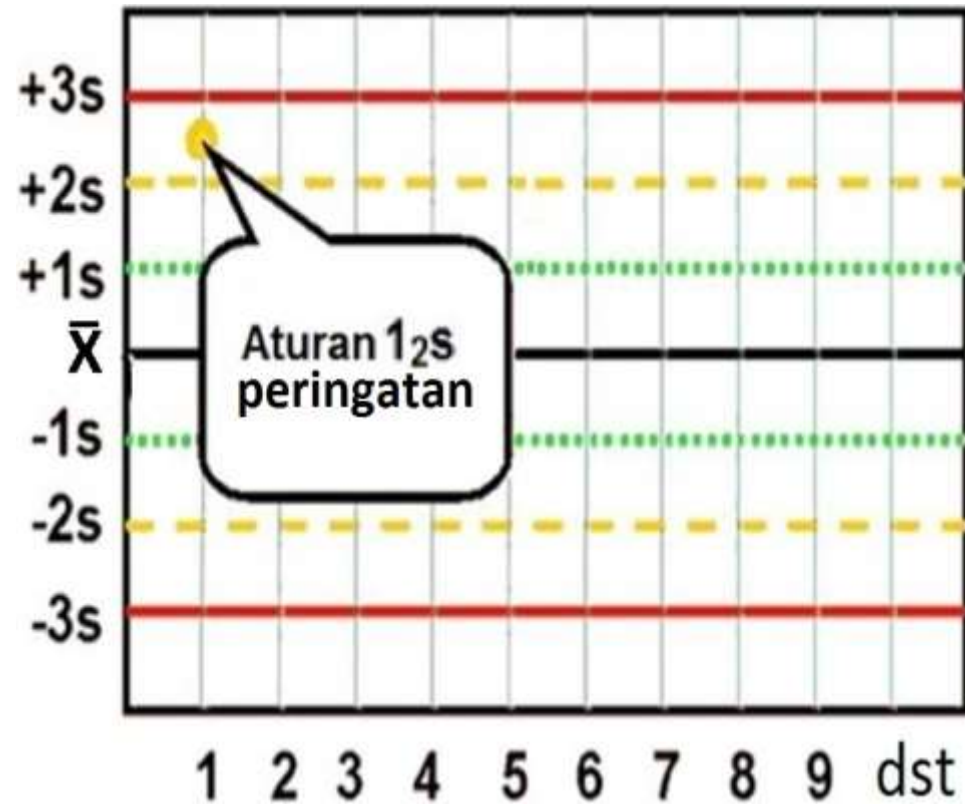
4_{1s}

2_{2s}

10_x

(biasanya menggunakan 2 level material kontrol dianalisis per *run*)

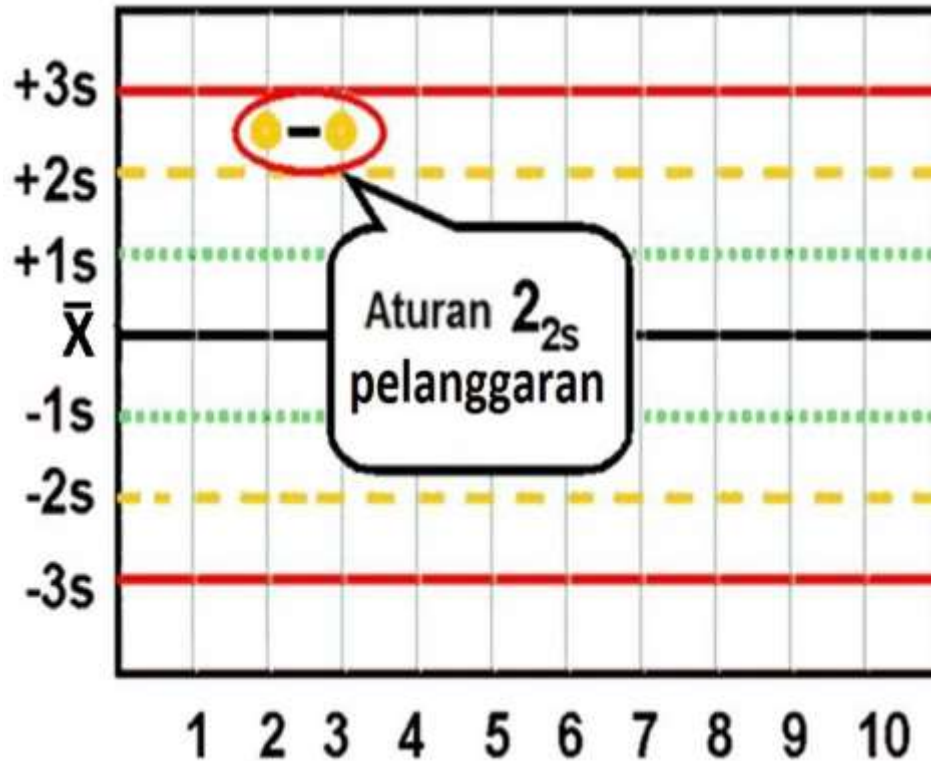
Aturan 1_{2s}



– 1_{2s}

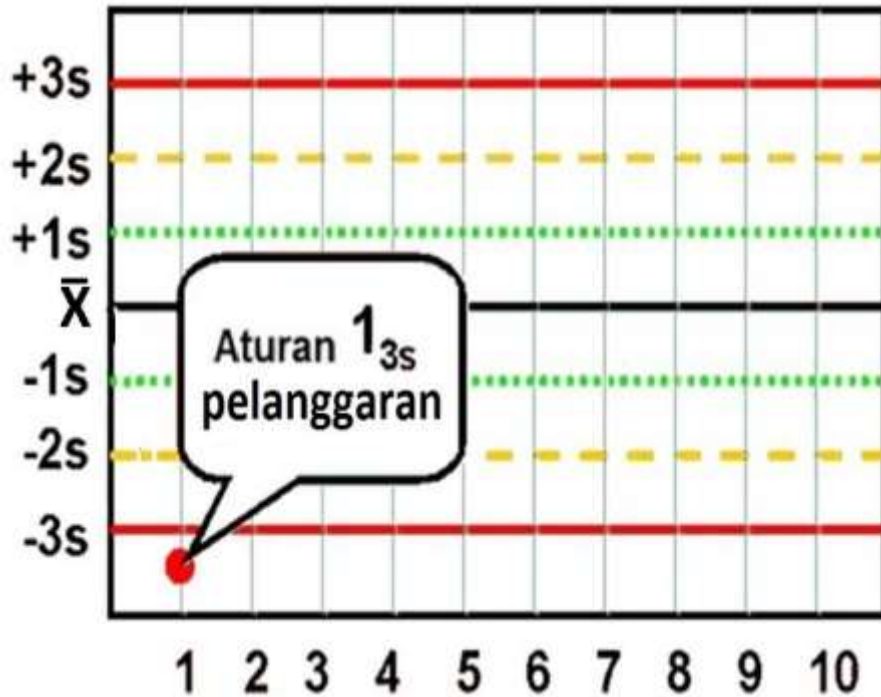
- A single control measurement exceeds two standard deviations from the target mean
- Action – must consider other rule violations
- This is a warning

Aturan 2_{2s}



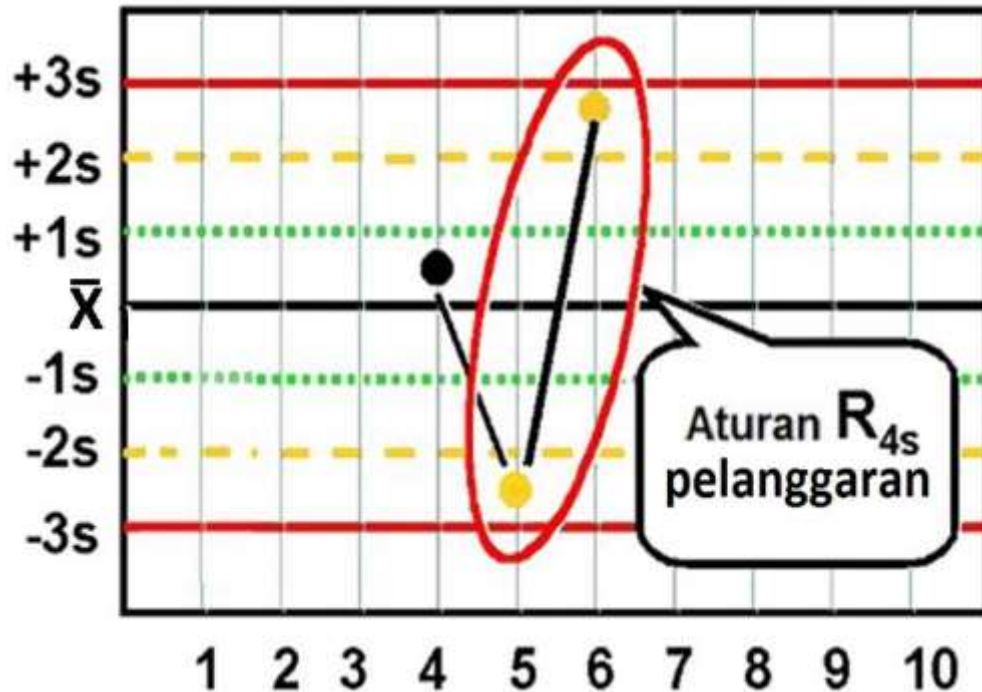
- 2_{2s}
 - Two consecutive control measurements exceed the same mean plus $2S$ or the same mean minus $2S$ control limit.
- Action – Reject

Aturan 1_{3s}



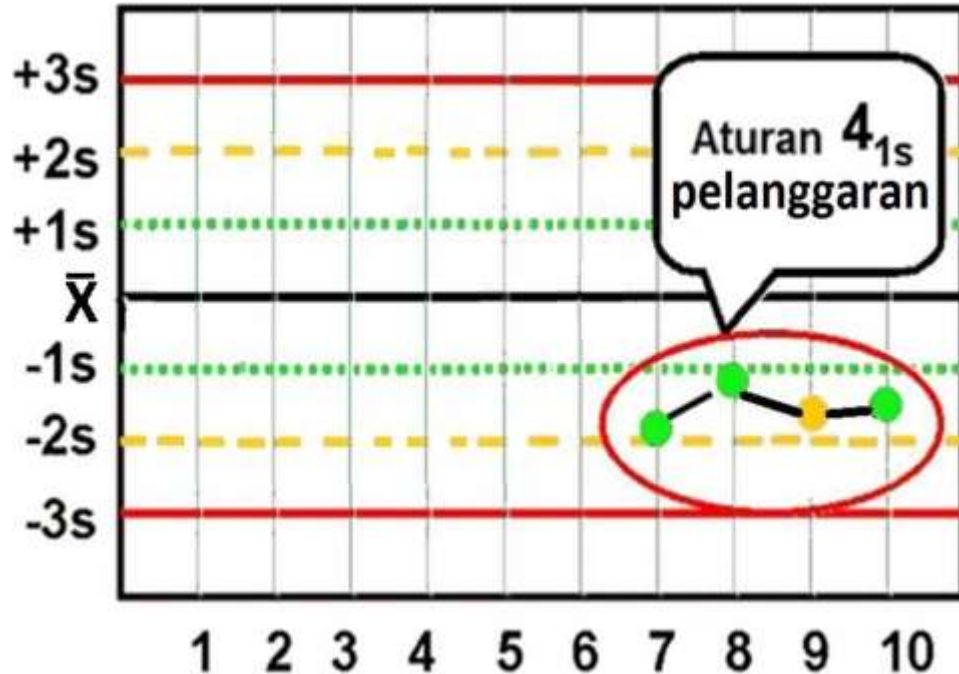
- 1_{3s}
- A single control measurement exceeds three standard deviations from the target mean
- Action - Reject

Aturan R_{4s}



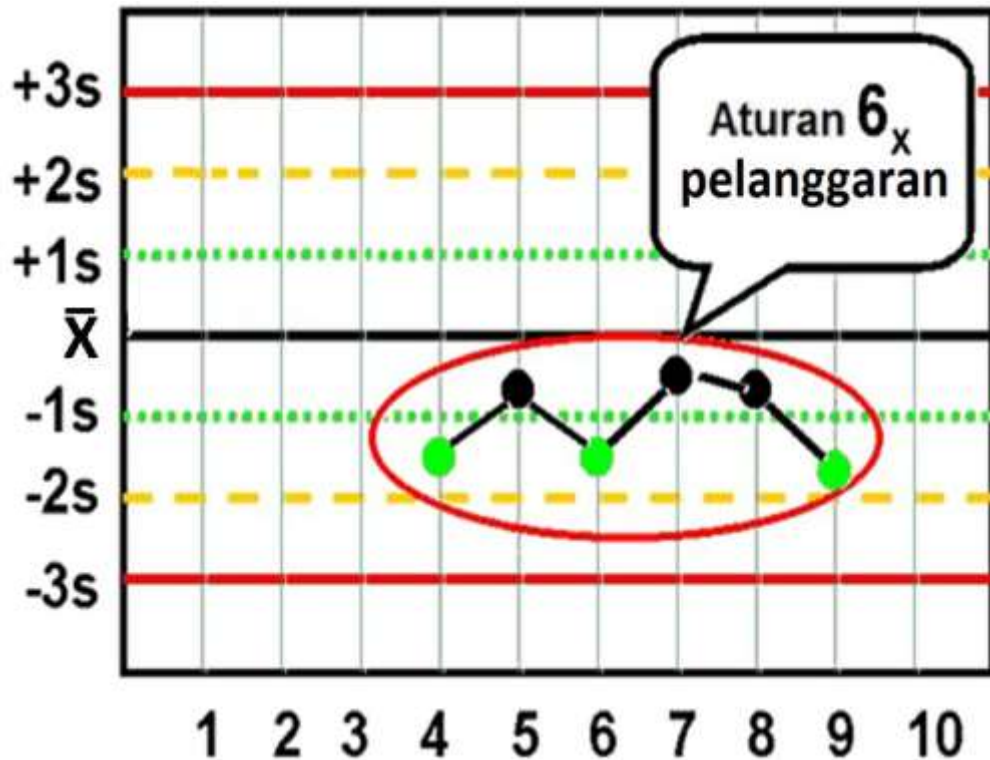
- R_{4s}
- One control measurement in a group exceeds the mean plus $2S$ and another exceeds the mean minus $2S$.
- Action – Reject

Aturan 4_{1s}



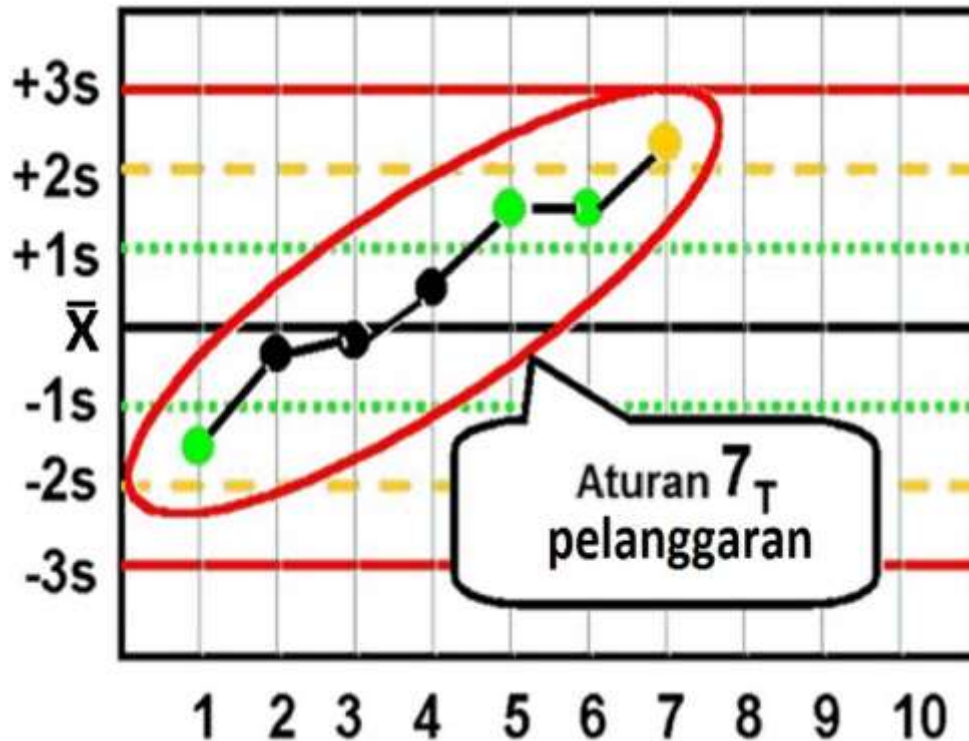
- 4_{1s}
- Four consecutive control measurements exceed the same mean plus 1S or the same mean minus 1S control limit.
- Action – Reject

Aturan 6x



- Systematic Error detected with 6σ : shift
- 6 results are on the same side of the mean

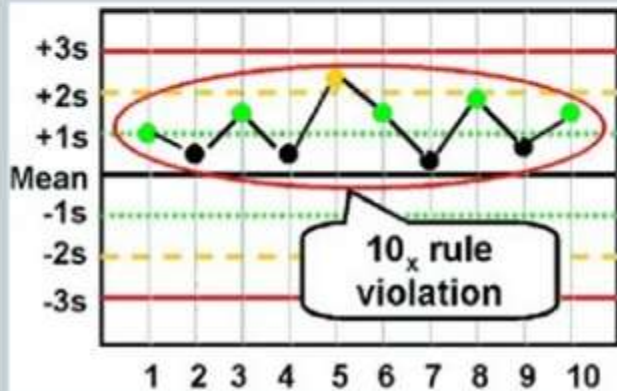
Aturan 7_T



- Systematic error detected with 7_t : trend
- 7 results falling in a pattern, up or down

10_x

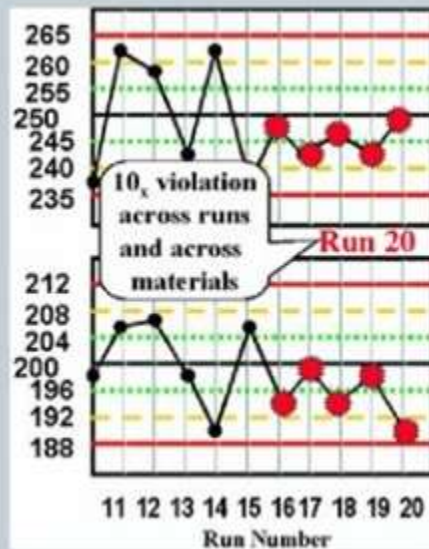
31



10_x warning when 10 consecutive control measurements fall on one side of the mean.

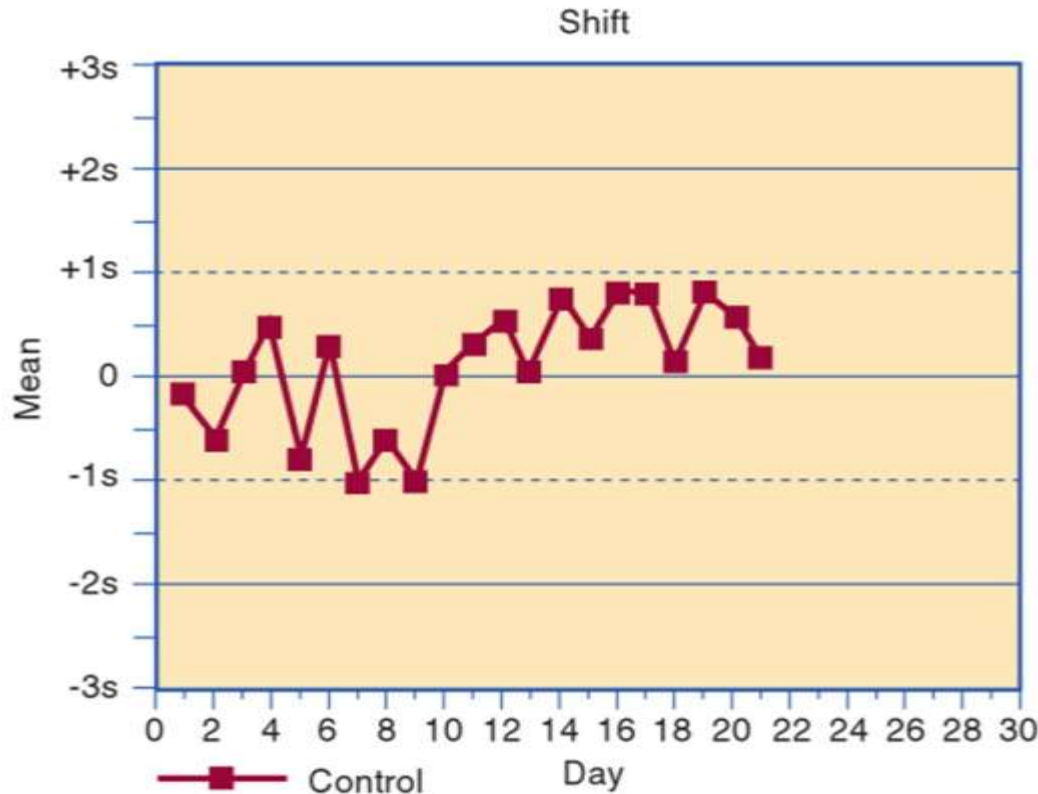
OR

5 consecutive control measurements fall on one side of the mean for two control levels.



Pola pd grafik Levey - Jennings

1. Pergeseran (shift)

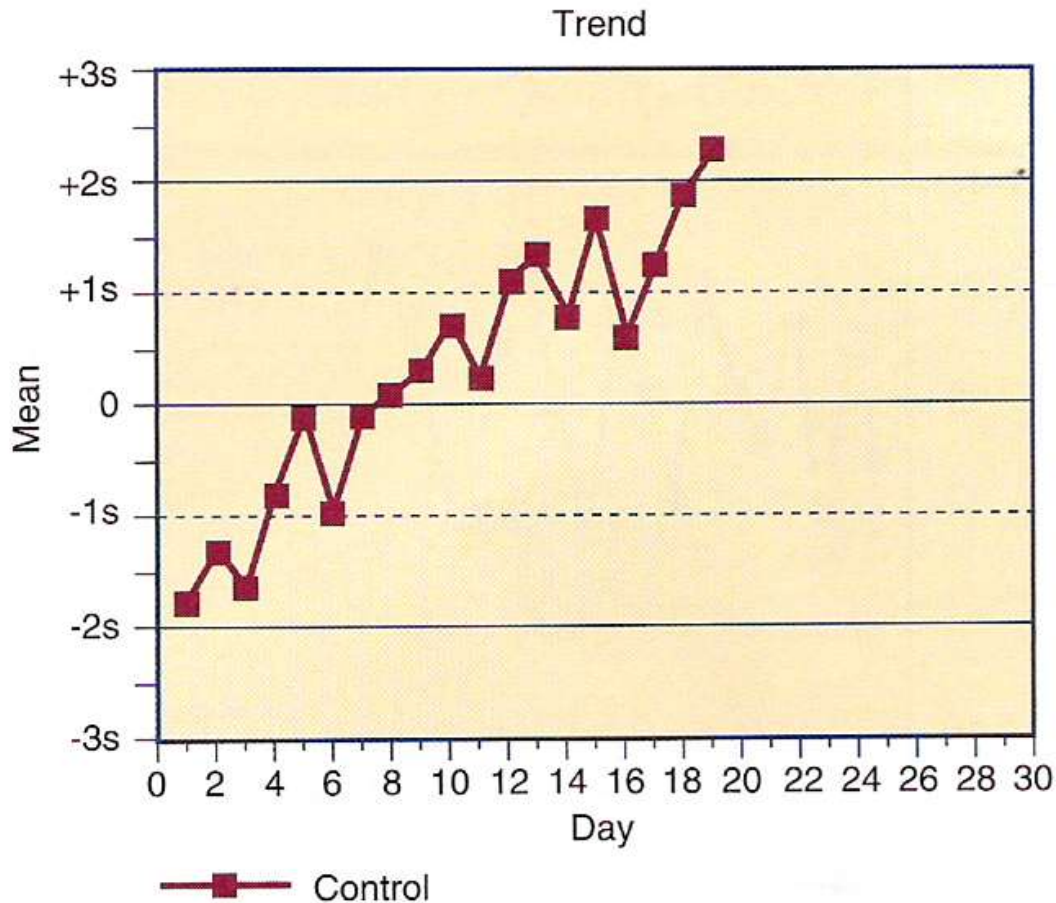


Pergeseran nilai kontrol dari satu tingkat ke tingkat lain
Perubahan ini bisa tiba-tiba atau perlahan

- Shift

- QC data results are distributed on one side of the mean for 6-7 consecutive days

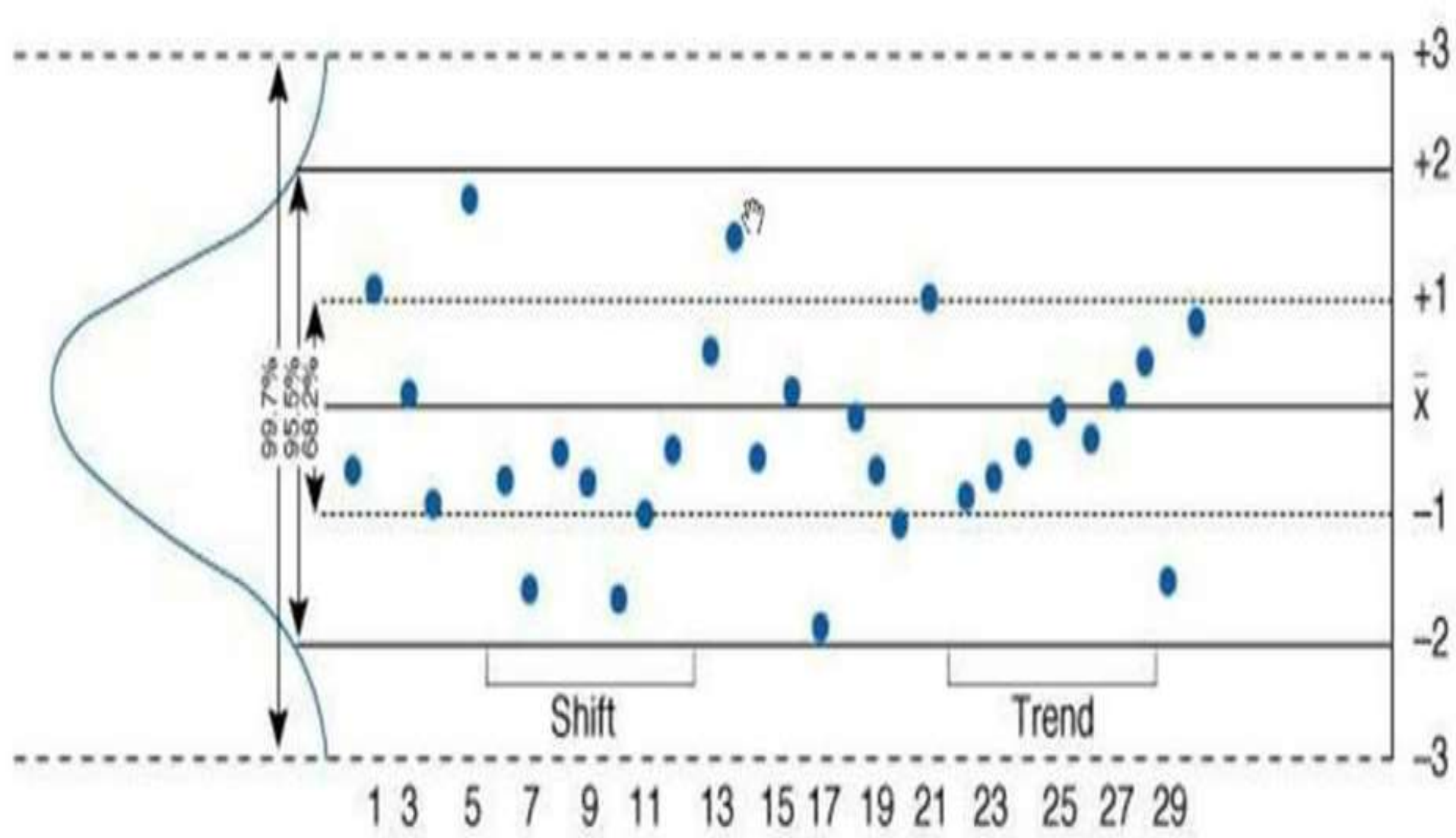
2. Kecenderungan (trend)



Pergerakan nilai dalam satu arah lebih dari 6 nilai

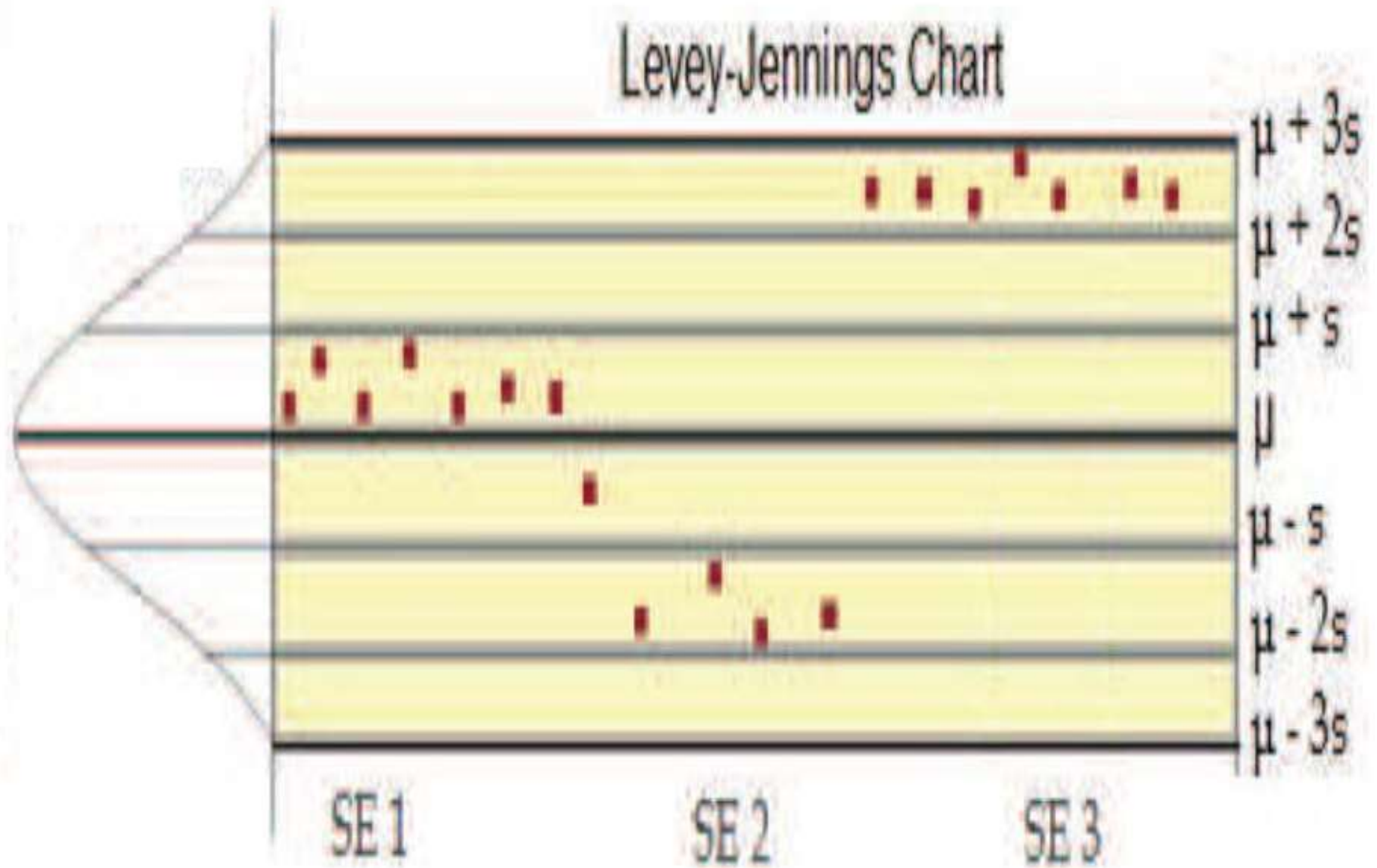
■ Trend

- Consistent increase or decrease of QC data points over a period of 6-7 days



- Pola *trend* tsb merupakan akibat dari kesalahan sistematis proporsional atau konstan

Levey-Jennings Chart

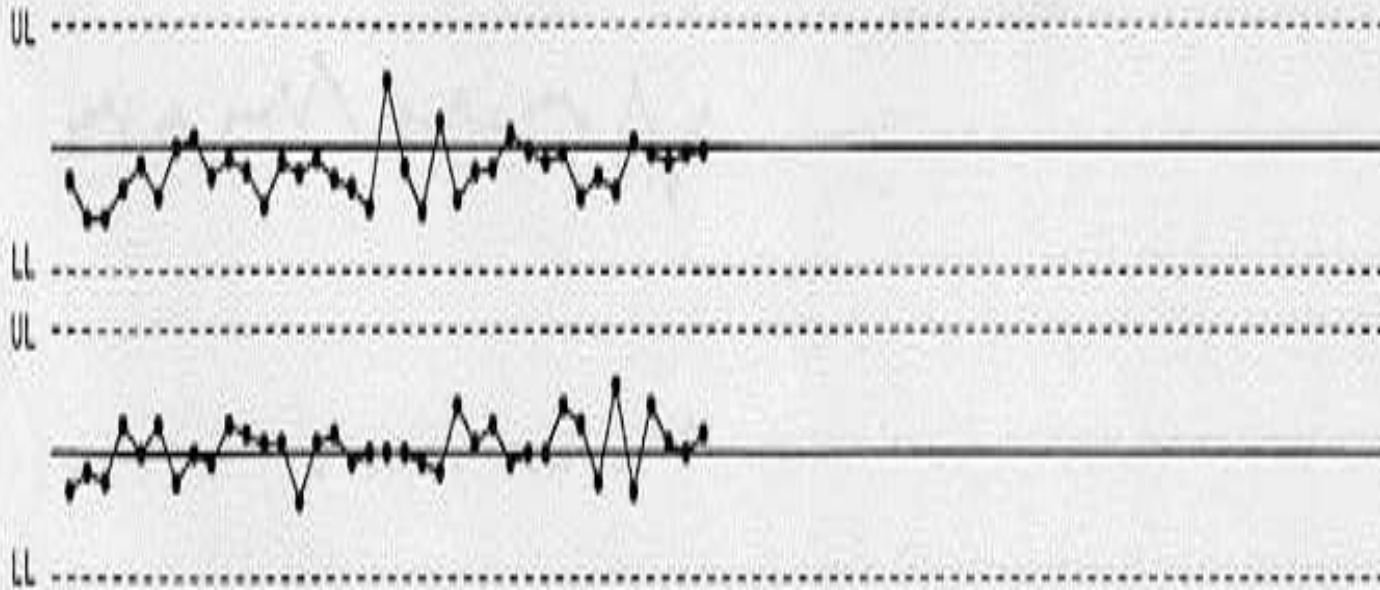


XE-2100 Quality Control

Material:e-CHECK Number of Plots:37
 Mode:Manual

Instrument ID	Level(Lot)	Lot No.	Exp. Day	Date From	To
XE-2100-1	Level2(Current)	QC-31320802	27/07/2003	09/06/2003	27/07/2003

Print Date:27/07/2003
 Time:16:09:17



UL=	7.38	SD=	0.097
Targ.=	6.96	Mean=	6.88
LL=	6.54	CV=	1.4
UL=	4.54	SD=	0.028
Targ.=	4.41	Mean=	4.41
LL=	4.28	CV=	0.6

Penggunaan Westgard's rules

