Clinical Safety & Effectiveness Session # 12

“Reduction of T& O Treatment Cancellation Rate”

AIM STATEMENT

To reduce the rate of T&O* treatment cancellation at the CTRC Radiation Oncology Clinic by at least 10% (or absolute 10% improvement) in the next 6 months (December to May 2010).

*Tandem & Ovoids Intracavitary Brachytherapy

Project Name: UTHSCSA CTRC Project Reduction of T&O Treatment Cancellation Rate

Participants:

Tony Eng, MD

Vanessa Magel, RN

Team members:

Jonathan Tinker, MBA

Kathleen Schwegmann, RN

Lupe Martinez, Edward Bustos, Diane Stewart, Kathy Scales, Luis Rocha, Liz Meyers

CS&E Course Facilitator:

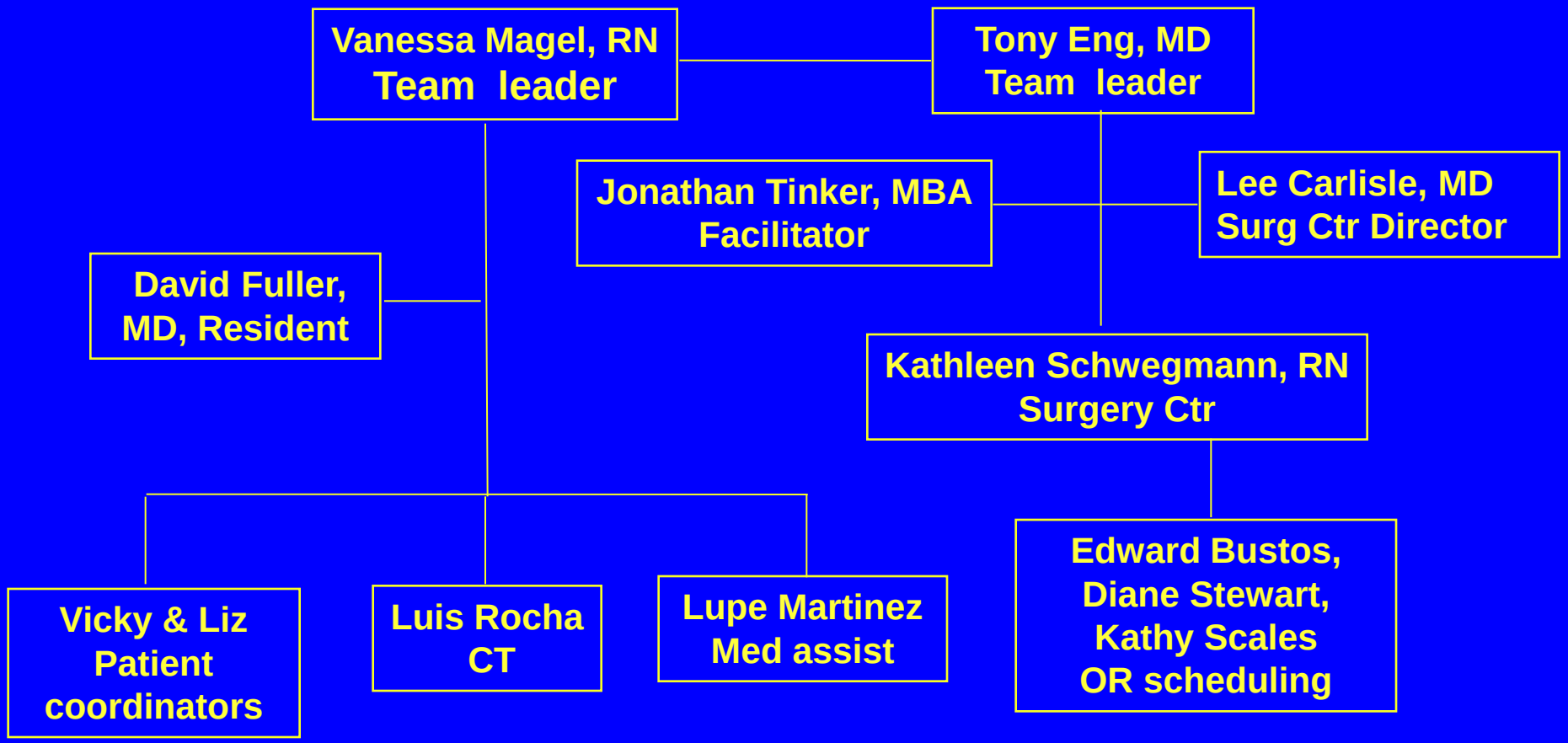
Wayne Fischer, PhD

Amruta Parekh, MD

Major Responsibilities

- **Tony Eng, MD**
  - Project Leader
  - Oversee team progress
  - Analyze data
- **Vanessa Magel, RN**
  - In charge of patient coordinators
  - Patient education
  - Nurses and MA's
- **Jonathan Tinker, MBA**
  - Administrative support
  - Problem solver
  - "Team Facilitator"
- **Kathleen Schwegmann, RN**
  - In charge of OR scheduling
  - OR resources
  - OR data
  - OR nurses

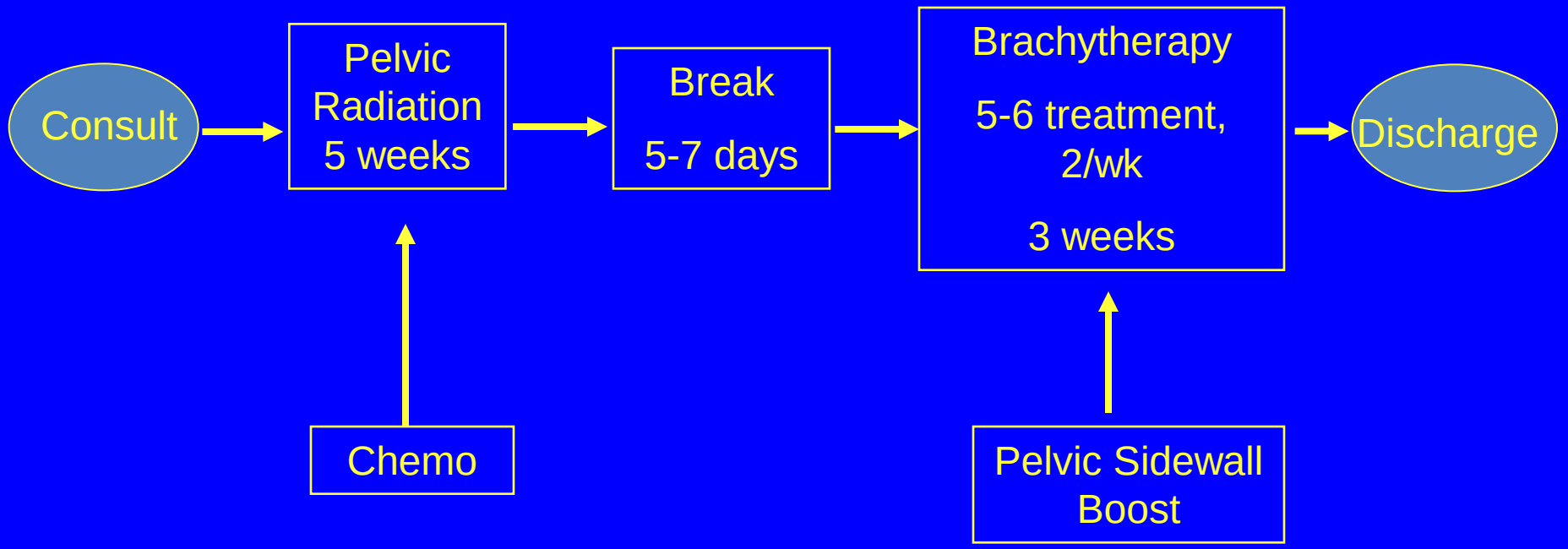
Team Organization



BACKGROUND

- Cervical Cancer can be cured with radiation therapy.
- One of the important prognostic factors is overall treatment time.
- The duration of treatment from the first external beam treatment to the last brachytherapy has shown to decrease control rates up to 10-15% (See Ref).
- Therefore, any cancellation leading to delay in radiation therapy will ultimately affect patient survival or cure.
- The goal of this project is to find the causes of treatment cancellation, implement corrective actions, and ensure sustainable improvement.

9-week Treatment Plan



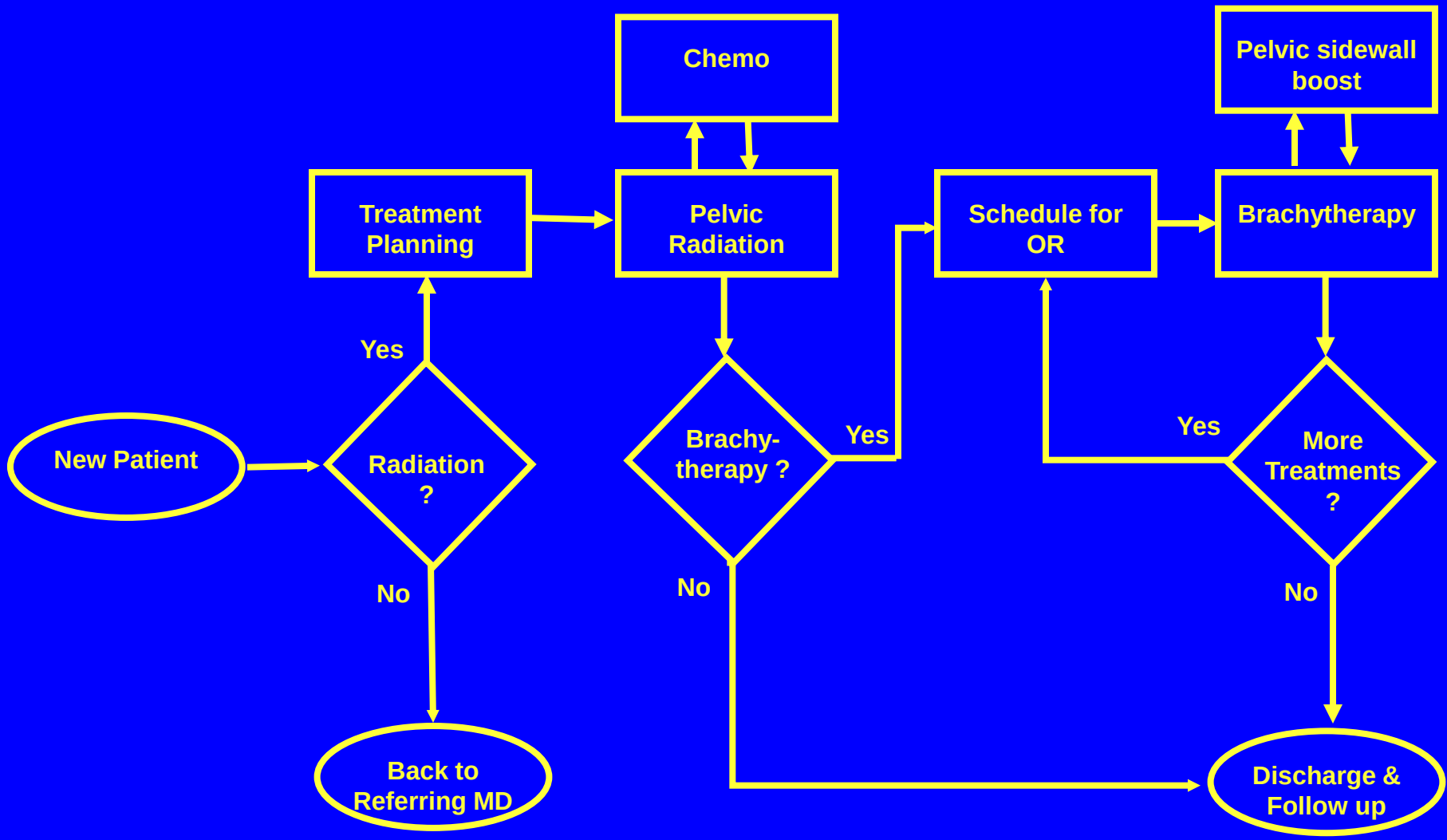
RT duration > 9 wks correlates with ↓ LC

Reference	Loss of pelvic control
Girinsky et al.	1.0% /day
Petereit et al.	0.7% /day
Perez et al.	0.9% /day
Fyles et al.	1.0% /day
Lanciano et.	~1%/day

Secondary endpoint

Reduce treatment delays by 10% (treatment duration less than 9 weeks or <63 days)

Patient Process Flowchart

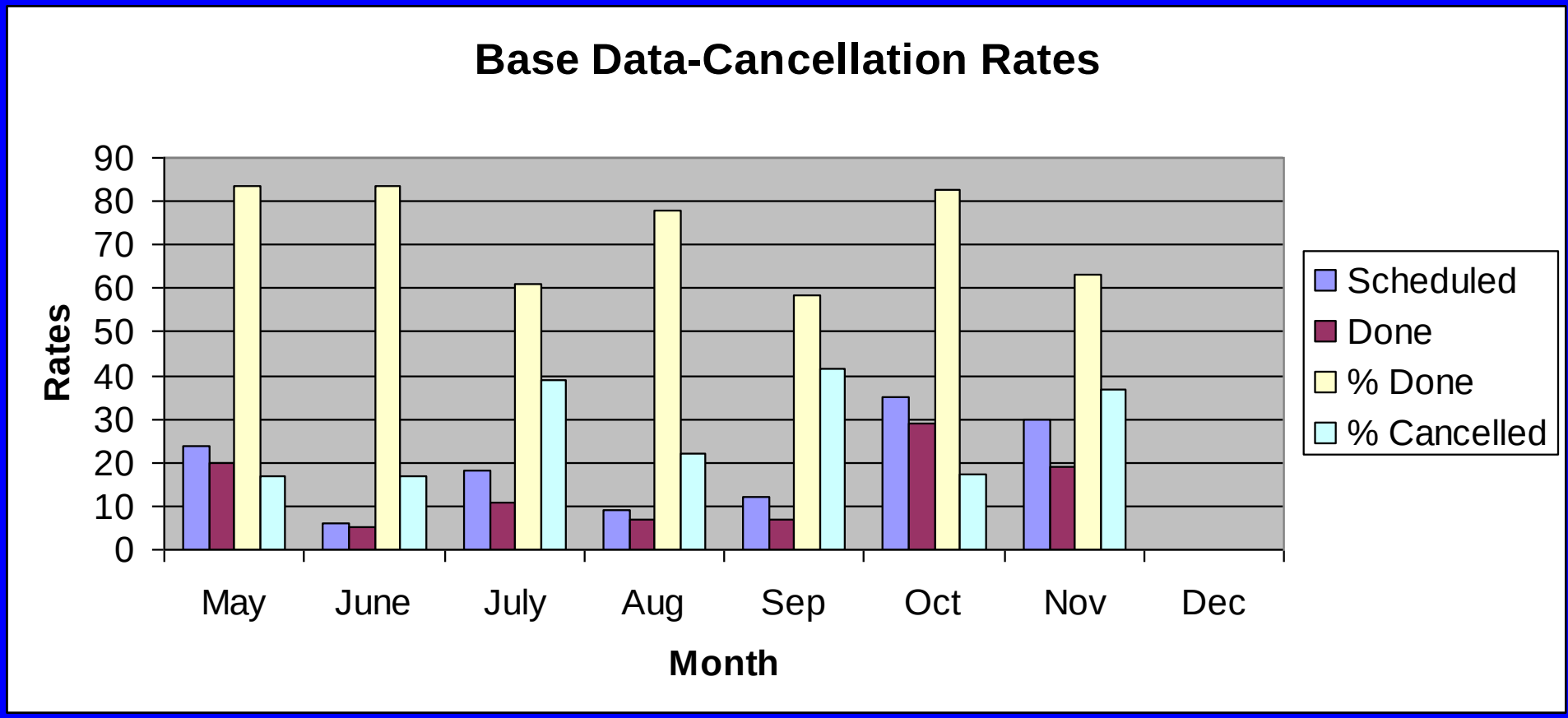


Observation

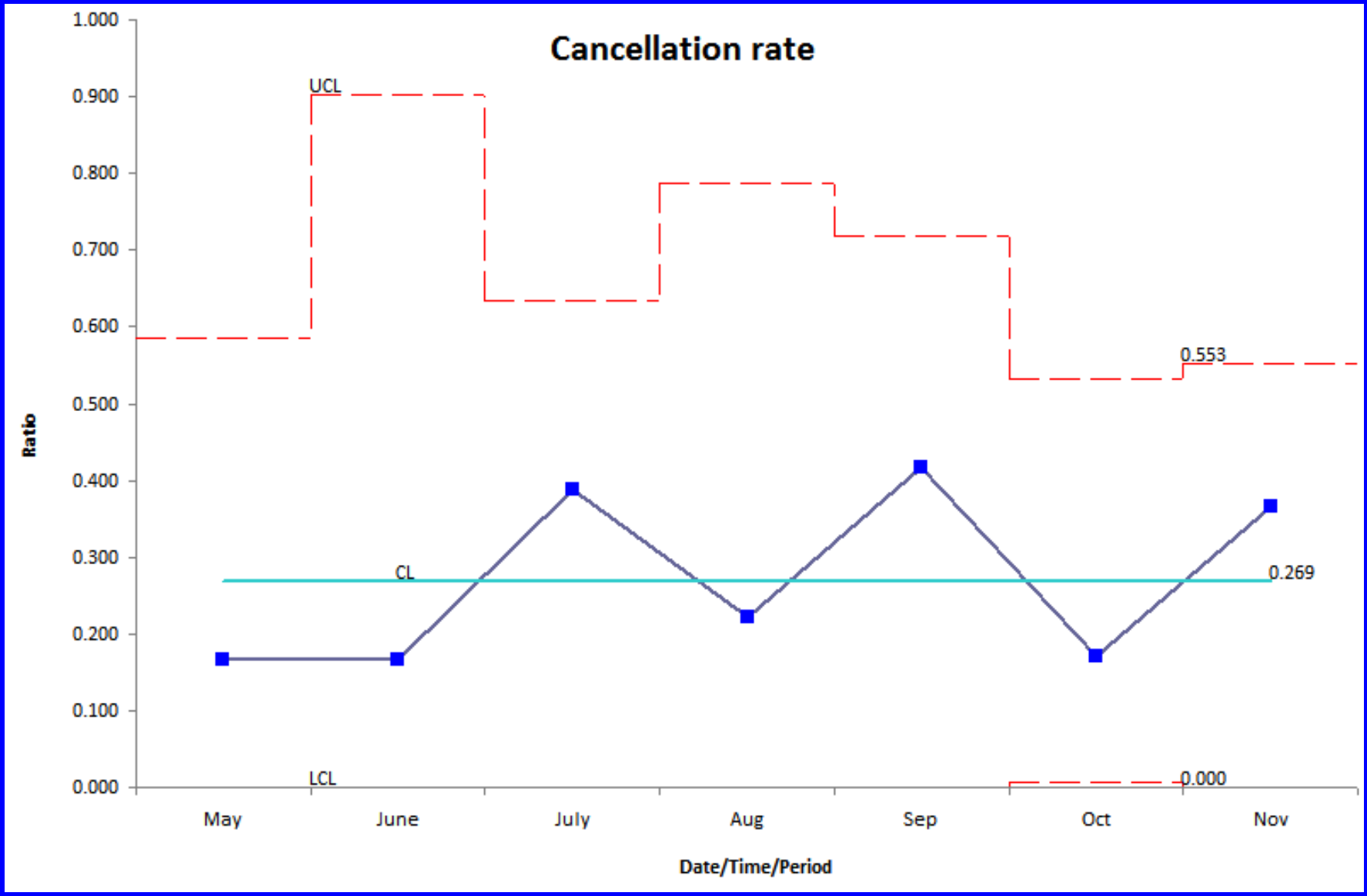
- Treatment Cancellation
  - Pelvic external beam therapy-minimal delays
  - Chemotherapy-minimal delays
  - Brachytherapy-**YES**
- We have to look into the brachytherapy cancellation rate due to various reasons

Base Data
Brachytherapy Cancellation Rates

	May	June	July	Aug	Sep	Oct	Nov	Total
Cases Scheduled	24	6	18	9	12	35	30	134
Cases Done	20	5	11	7	7	29	19	98
% Done	83	83	61	78	58	83	63	73
% Cancelled	17	17	39	22	42	17	37	27


Base Data-Cancellation Rates
Rates
90
80
70
60
50
40
30
20
10
0
May
June
July
Aug
Sep
Oct
Nov
Dec
Month
Scheduled
Done
% Done
% Cancelled

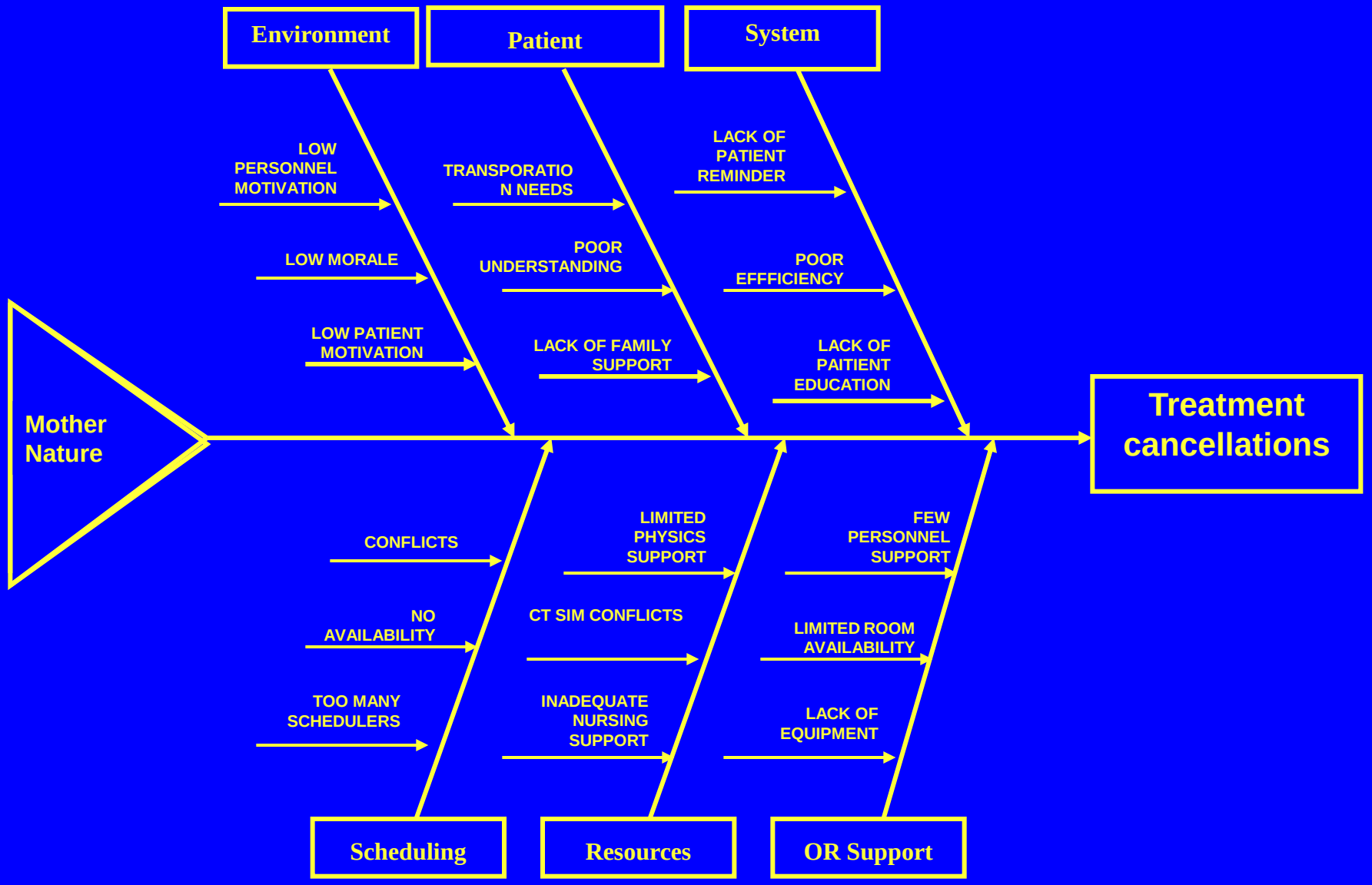
Base Data Control Chart



Secondary Endpoint Treatment Delays: May-Nov 2009 Base Data Summary

- 28 patients received HDR for T&O treatment
- 43% completed the treatment on time (within 9 weeks or <63 days)
- 57% were delayed (over 9 weeks or >63 days)
- Average number of days delayed: 10.5 days

Cause & Effect Diagram

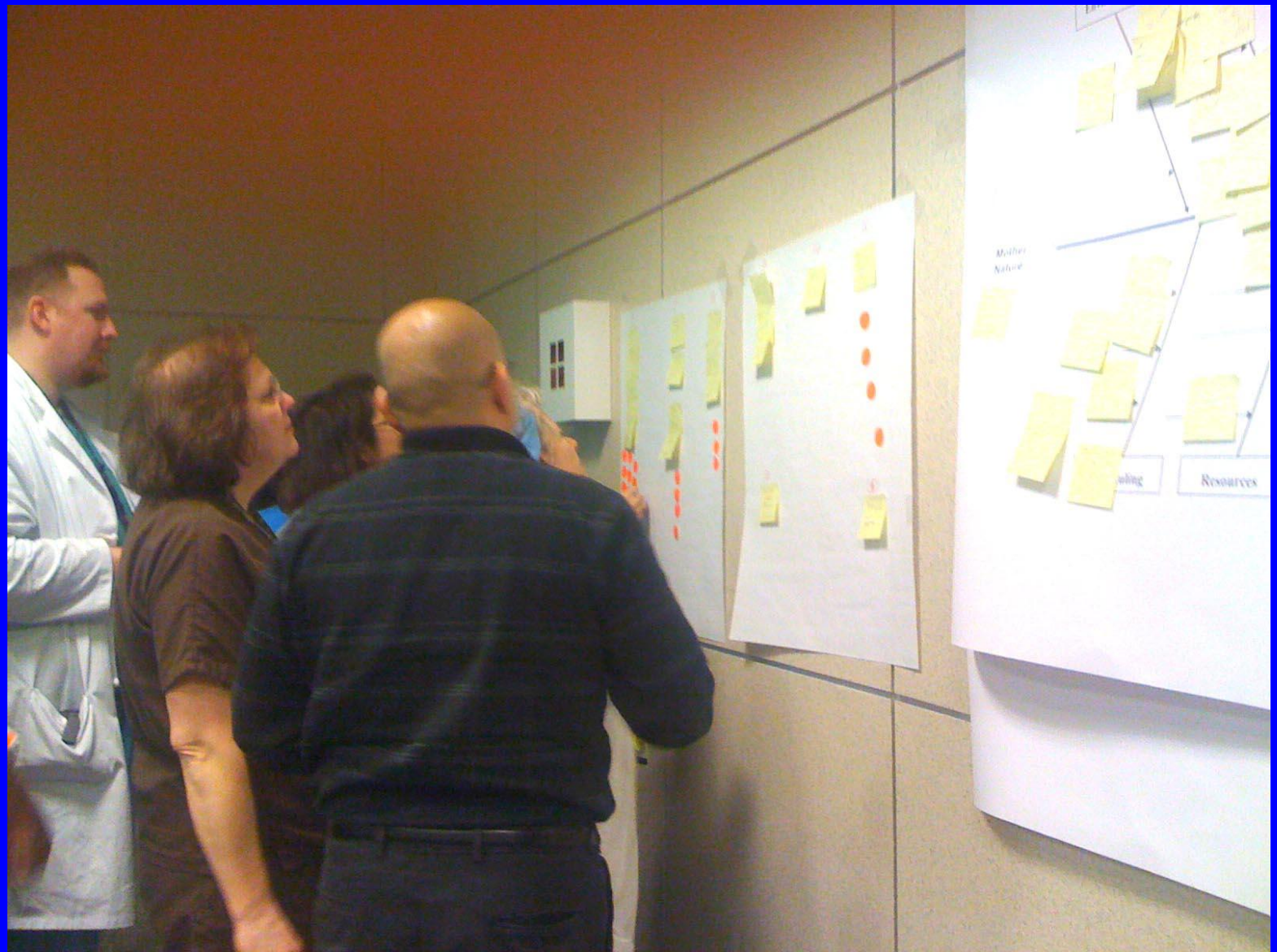


Brainstorming Team Meet

Common Root Causes Discussed

- Patient factors (understanding, motivation, education)
- Scheduling
- Logistics (Transportation, finance)
- Social Work
- Medical problems
- Resources/personnel cut

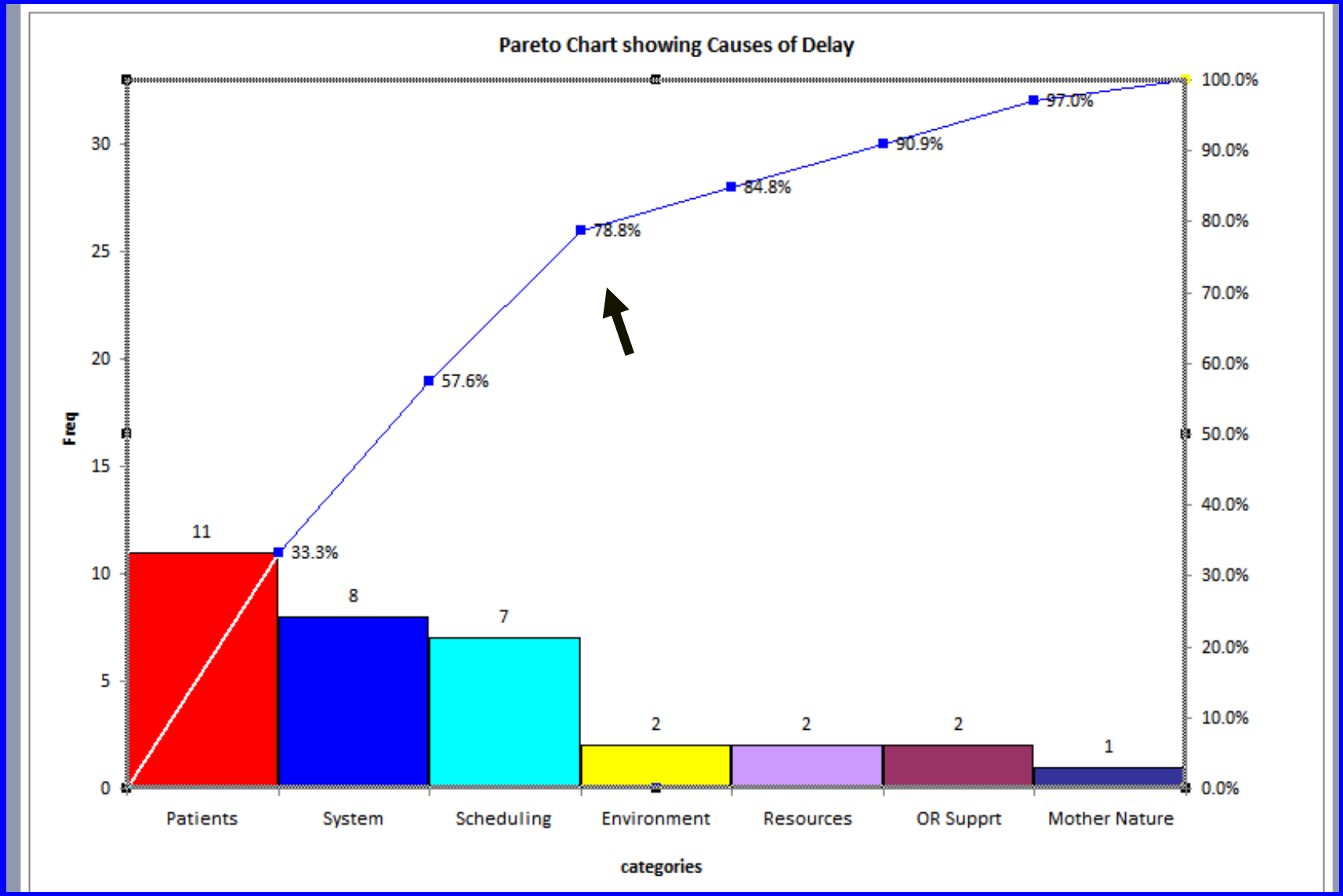
Affinity sort



Causes of Cancellations

- Patient=11
- Scheduling=7
- Resources=2
- Mother nature=1
- System=8
- OR support=2
- Environment=2

Pareto Diagram



"80-20 rule"- roughly 80% of the effects come from 20% of the causes

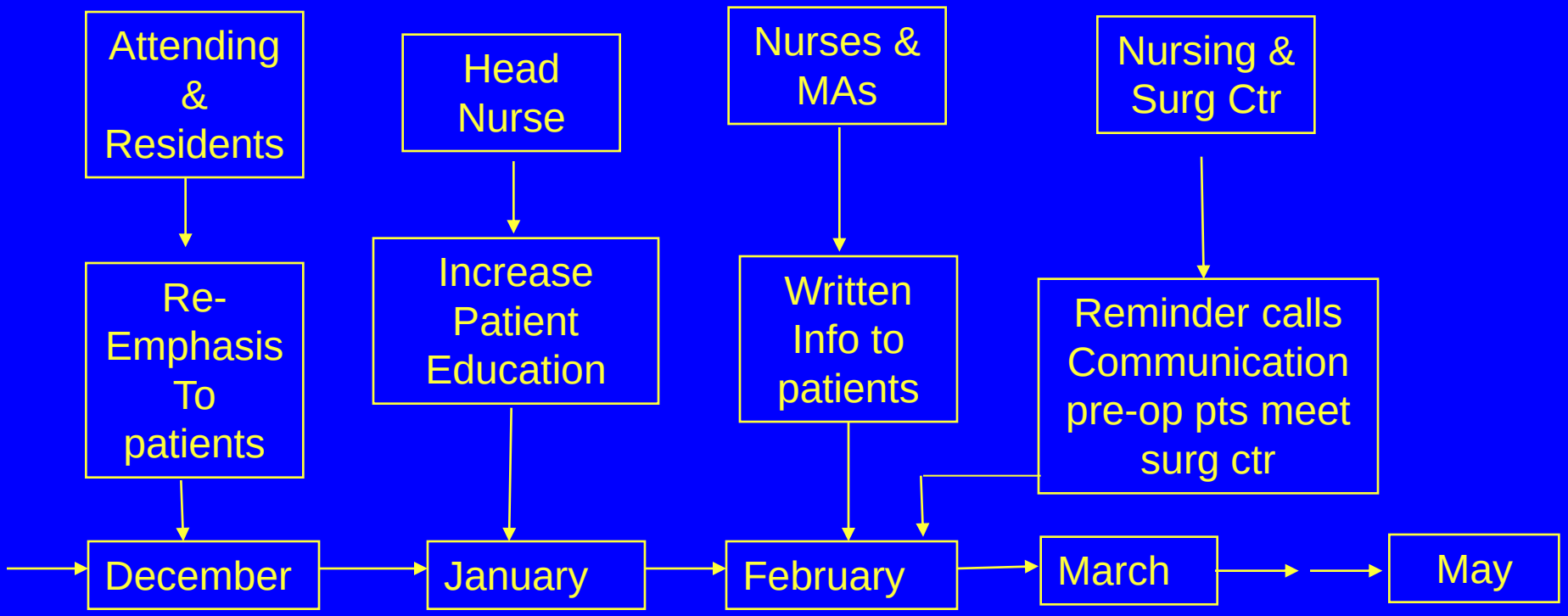
Brainstorm Team Suggestions

- Patient Education=19
- Patient Pre-op Instructions=13
- HDR Coordinator=12
- Patient Reminder=4
- Scheduling Conflicts=4
- Schedule checklist=4
- RX in Computer=3
- Social Work Consultation=0

Interventions

- Reminder calls-two
- Patient education
- Written info
- Scheduling check –Pre-op meet with surg center
- Promote Motivation
- Better Communication

Intervention Timeline

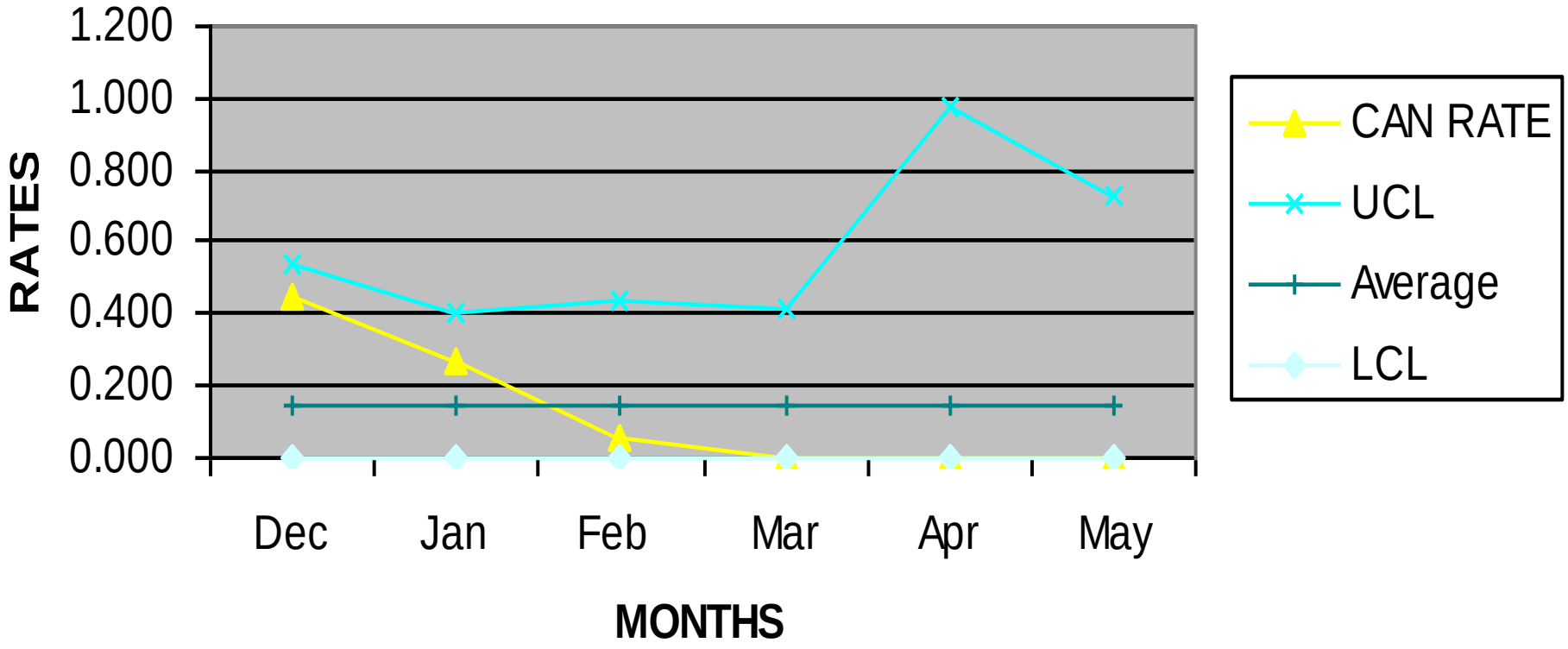


Results

Post-intervention Cancellation Rates

	Dec	Jan	Feb	Mar	Apr	May	Jun	Total
Scheduled	9	22	17	19	2	4		73
Done	5	16	16	19	2	4		62
% Done	56	73	94	100	100	100		85%
% Cancelled	44	27	6	0	0	0		15%

POST INTERVENTION CANCELLATION RATES



Treatment Cancellations Leading to Delays: Dec 2009-May 2010 Post-intervention Summary

- 10 patients received HDR for T&O treatment
- 50% (vs. 43%) completed the treatment on time (within 9 weeks or <63 days)
- 50% (vs. 57%) were delayed (over 9 weeks or >63 days)
- Average number of days delayed: 10.8 days (vs. 10.5 days)

Statistical Significance

- Cancellation rates: 27% (36/134) vs. 15% (11/73)
  - Z-test for 2 proportions, 95% Conf, 1-tail,
  - Yes, Z=1.763,
- Treatment Delay rates: 57% (16/28) vs. 50% (5/10)
  - No, Z=0.019

Return on Investment

- Reduction of manpower
- Less waste of resources
- Potential improved disease control
- $$ saved

Return on Investment

- Step 1.

Calculate Labor Cost to Schedule the Procedure

  - $489.24
  - 10.6 hours of staff time

Title	Hours Per Case to Book
XRT RN	1.5
MD	0.75
Resident	1
Patient Coordinator/Financial Clearance	4
Radiation Therapist	0.5
CT Technologist	0.25
Physicist	0.5
Medical Assistant	0.1
ASC RN	2
Total Labor Cost	**$ 489.24**

Return on Investment

- Step 2.

Cost of Labor times 40 cases cancelled (May through Dec)

  - $19,570

- Step 3.

Subtract Cost of Labor times 7 cases cancelled (Jan through May) extrapolated to forecast through August

  - $3,811

Return on Investment

- $15,758 cost savings over 9 month period
- **$21,011** cost savings annualized

Summary

- Cancellation rate is substantially improved
- However, it has not translated into significant reduction of treatment delays
- Other Uncontrolled Factors: hospitalizations (DM, amp,..), unexpected side effects (bladder spasm,..)
- Limitations
  - small study, lacking statistical power

Future Direction

- Sustain current interventions
- Continue data collection
- Apply the method to other scheduled brachytherapy procedures


Thank God it snows. I get to leave early!
No Smoking

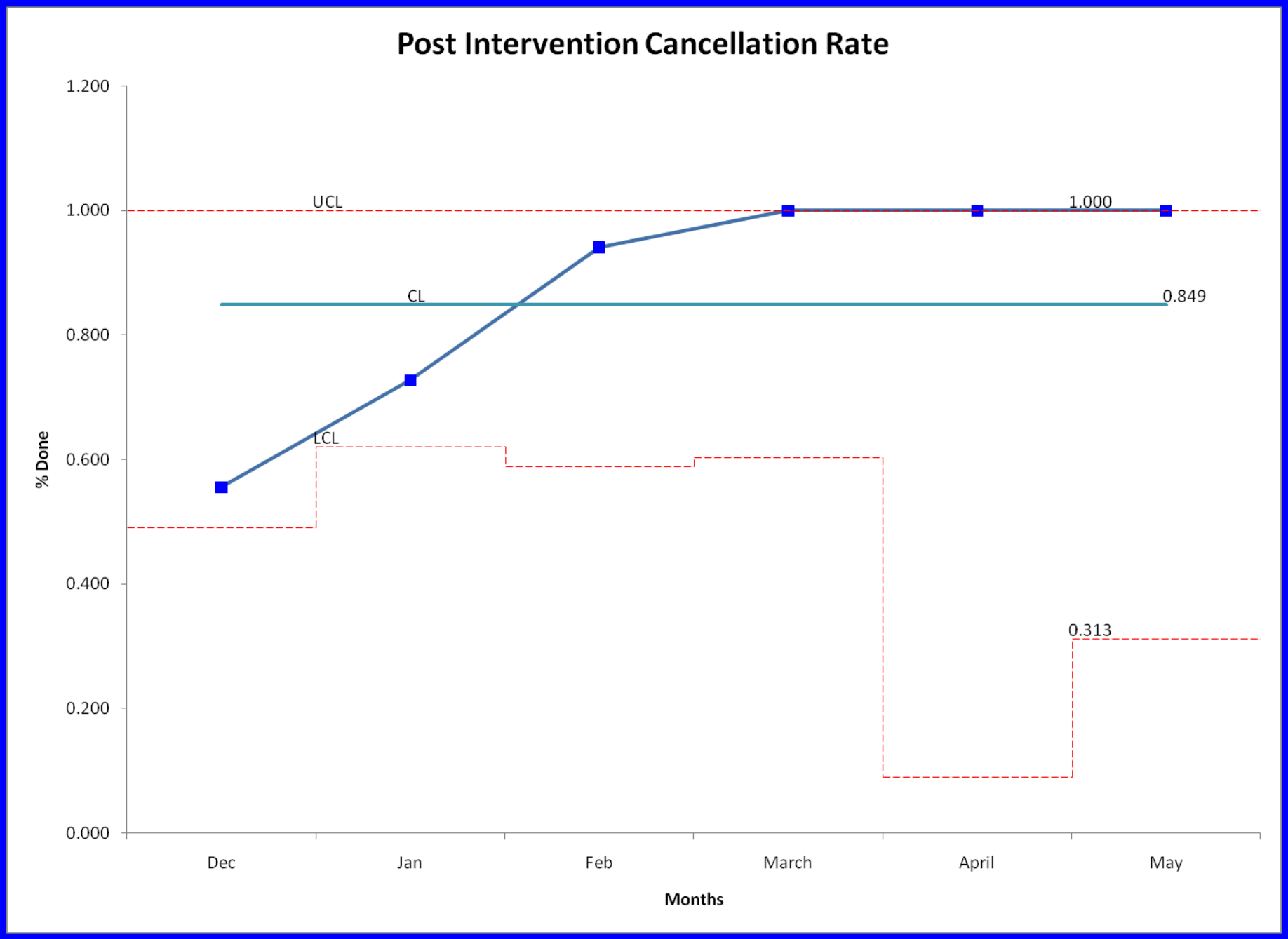
References

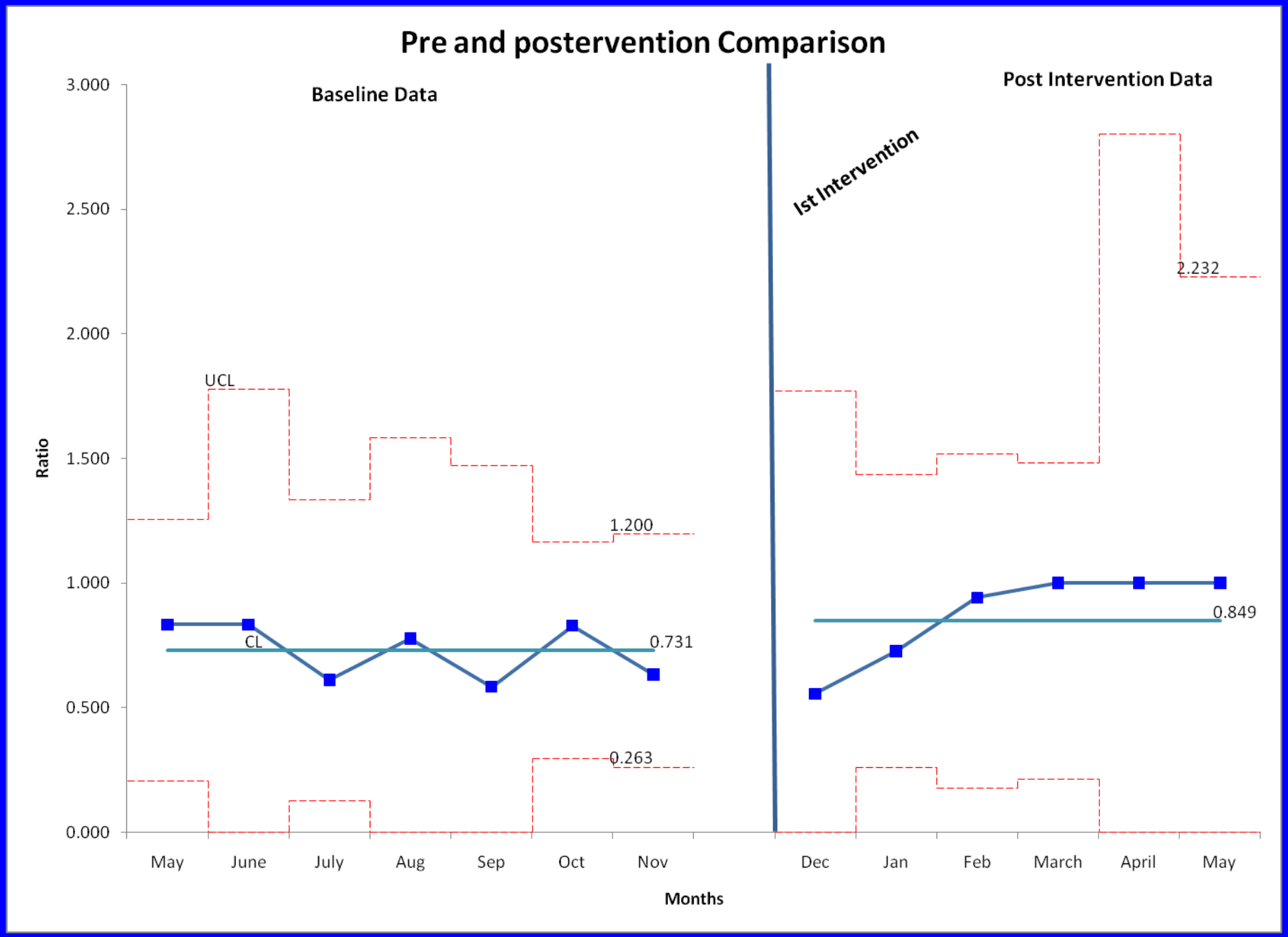
- **Wash U, 1995.** Carcinoma of the uterine cervix. I. Impact of prolongation of overall treatment time and timing of brachytherapy on outcome of radiation therapy. Perez CA et al. Int J Radiat Oncol Biol Phys. 1995 Jul 30;32(5):1275-88.

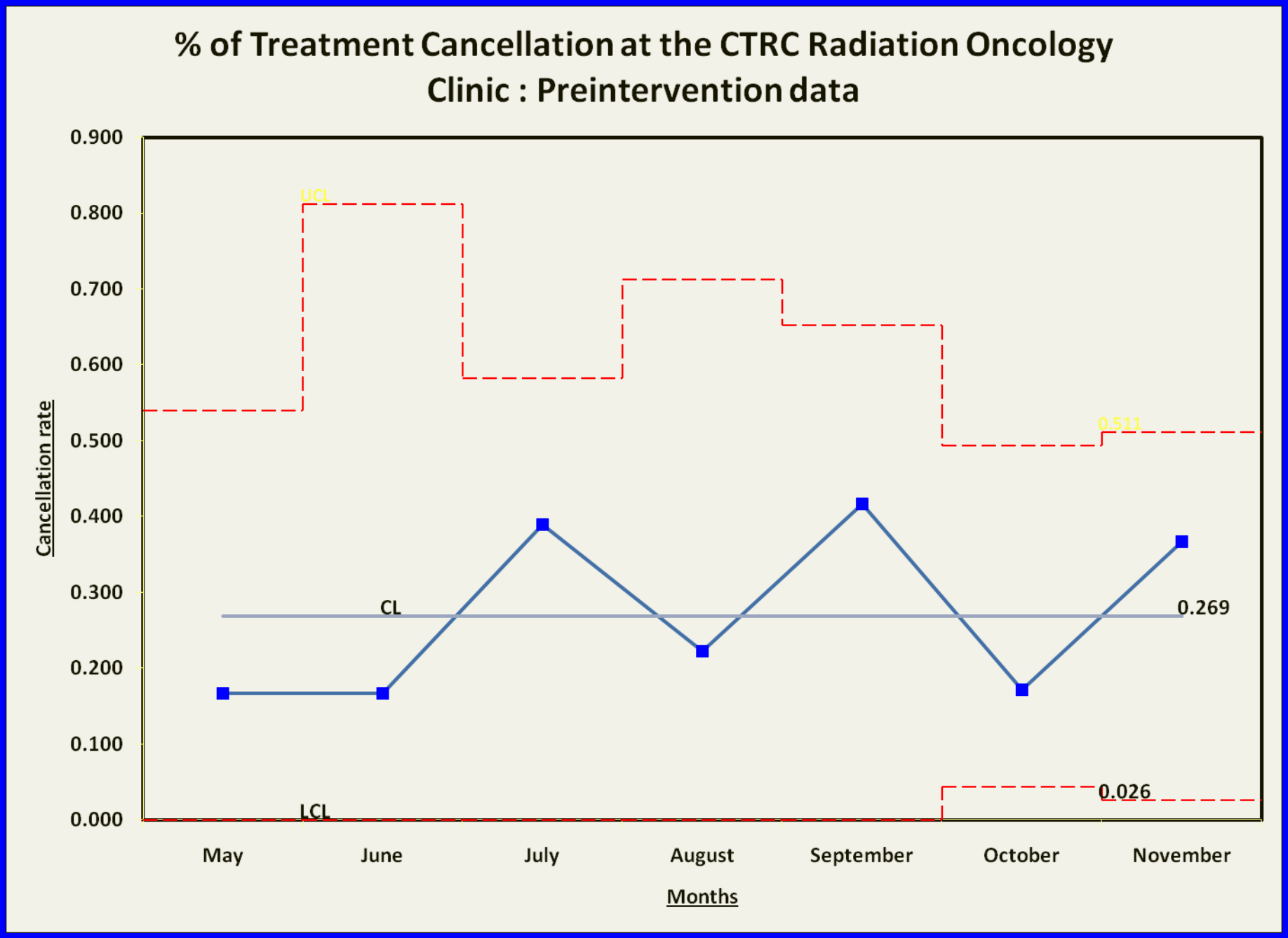
- **Patterns of Care, 1993.** The influence of treatment time on outcome for squamous cell cancer of the uterine cervix treated with radiation: a patterns-of-care study. Lanciano RM, Int J Radiat Oncol Biol Phys. 1993 Feb 15;25(3):391-7.

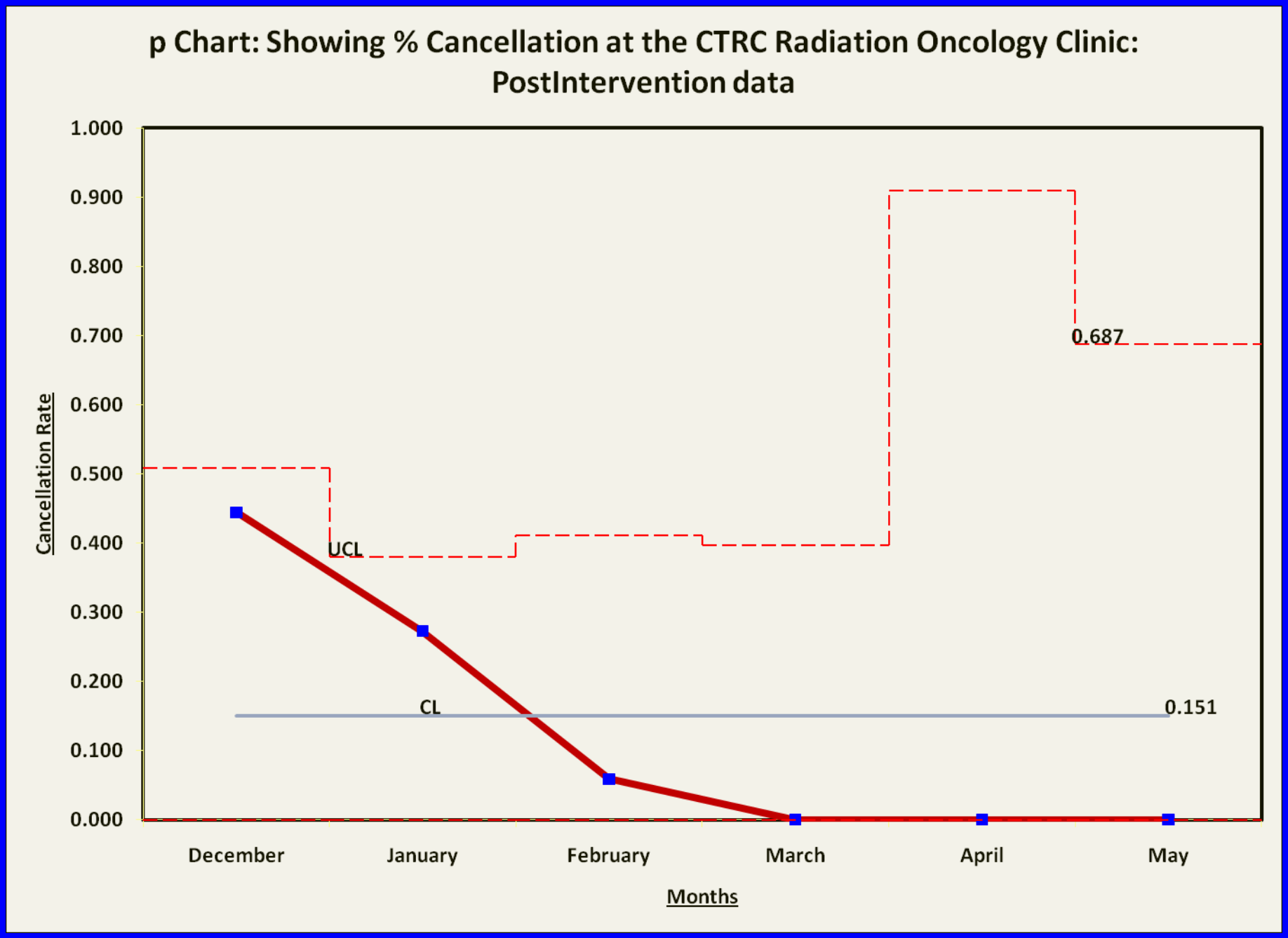
- **Gustave-Roussy, 1993.** Overall treatment time in advanced cervical carcinomas: a critical parameter in treatment outcome. Girinksy T et al. Int J Radiat Oncol Biol Phys. 1993 Dec 1;27(5):1051-6.

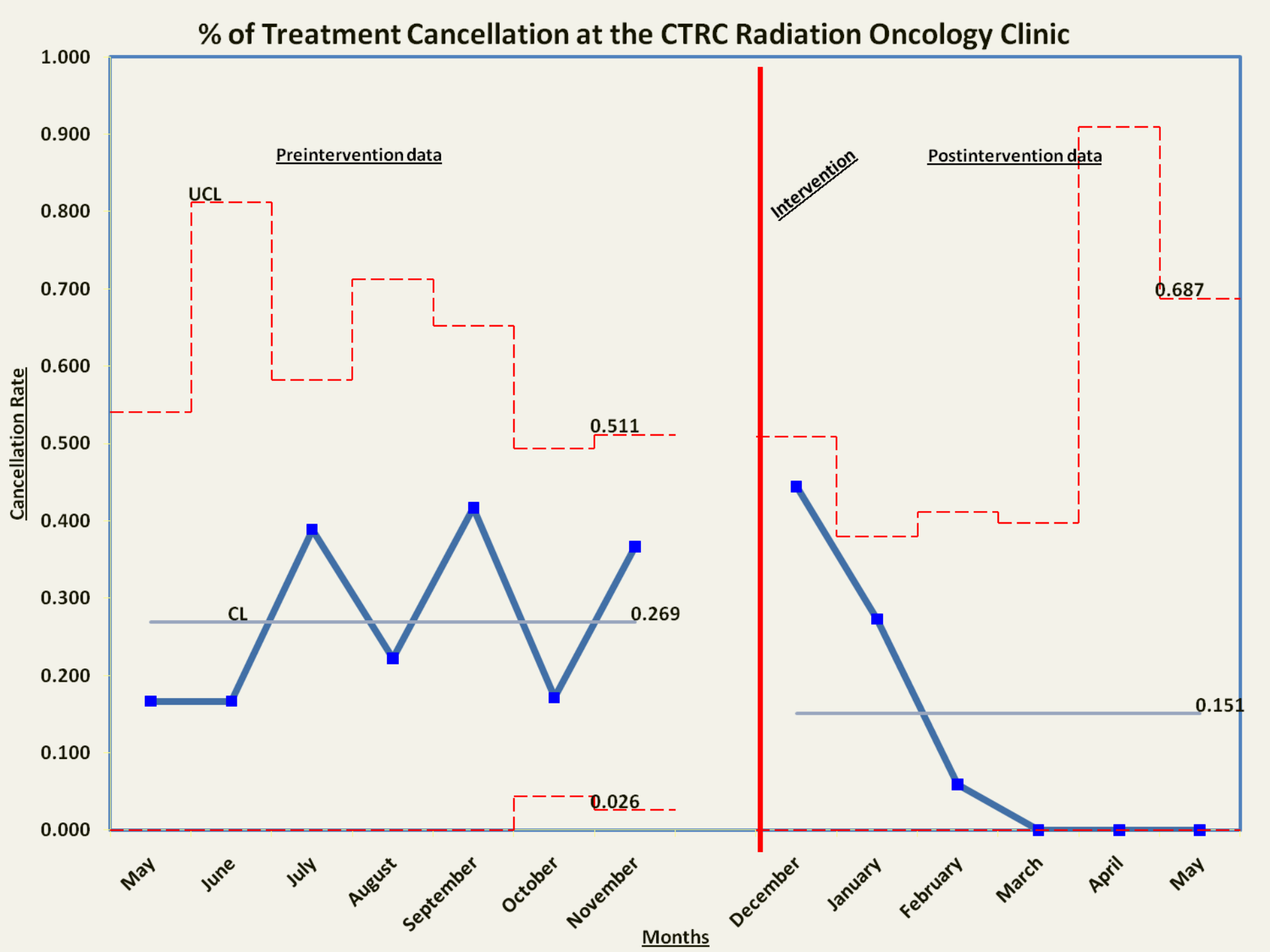
- **Princess Margaret, 1992.** The effect of treatment duration in the local control of cervix cancer. Fyles A, Radiother Oncol. 1992 Dec;25(4):273-9.


Post Intervention Cancellation Rate
1.200
1.000
0.800
0.600
0.400
0.200
0.000
% Done
UCL
CL
LCL
1.000
0.849
0.313
Dec
Jan
Feb
March
April
May
Months


Pre and postervention Comparison
Baseline Data
Post Intervention Data
Ist Intervention
3.000
2.500
2.000
1.500
1.000
0.500
0.000
Ratio
UCL
CL
1.200
0.731
0.263
2.232
0.849
May
June
July
Aug
Sep
Oct
Nov
Dec
Jan
Feb
March
April
May
Months


% of Treatment Cancellation at the CTRC Radiation Oncology Clinic : Preintervention data
Cancellation rate
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
UCL
0.511
CL
0.269
LCL
0.026
May
June
July
August
September
October
November
Months


p Chart: Showing % Cancellation at the CTRC Radiation Oncology Clinic: PostIntervention data
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
Cancellation Rate
UCL
CL
0.687
0.151
December
January
February
March
April
May
Months


% of Treatment Cancellation at the CTRC Radiation Oncology Clinic
1.000
0.900
0.800
0.700
0.600
0.500
0.400
0.300
0.200
0.100
0.000
Cancellation Rate
Preintervention data
Intervention
Postintervention data
UCL
0.511
0.687
CL
0.269
0.151
0.026
May
June
July
August
September
October
November
December
January
February
March
April
May
Months