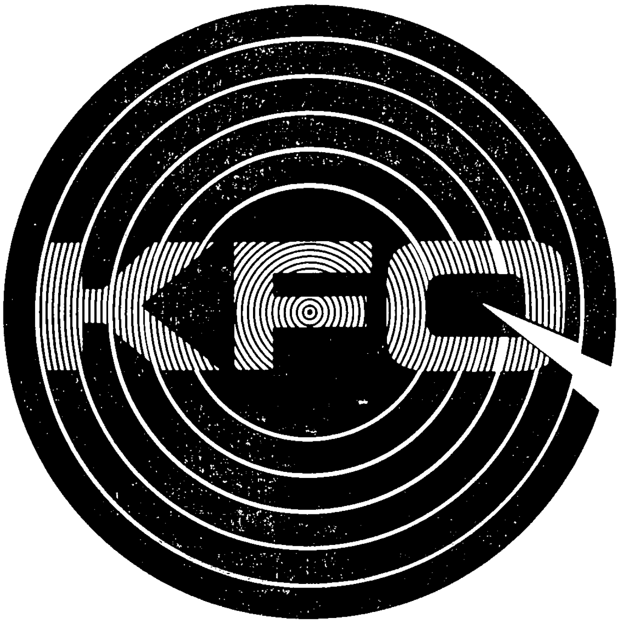

A Training Manual
in
Quality Circle Techniques

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QUALITY CIRCLE TRAINING MANUAL

for

LEADERS AND FACILITATORS

This is a working manual; most of the left-hand pages have been left blank to allow individuals to make additional or alternative comments when working with the material.

September 1986

King's Fund Centre
126 Albert Street
London NW1 7NF

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The feminine pronoun has been used throughout this manual though all statements refer equally to both genders. -

FOREWORD

> 'Training is everything. The peach was once a bitter almond; cauliflower is nothing but cabbage with a college education'.
>
> Mark Twain

This training manual has been written over many months by a group of people who were interested in the concept of Quality Circle techniques. Interested, yet not entirely committed to the idea. They brought with them a healthy scepticism and insisted in testing every aspect of the vast material at their disposal, not only theoretically but practically. Ideas were tested where 'messy mortals' could sabotage effort and did; but as the work progressed so changes developed in their own Circles at District level, which surprised and excited the group members themselves.

The work was slow but a high level of participation persisted at all meetings and the group members were determined to produce a manual pleasing to read and not bogged down with excess terminology.

This publication is offered as a model, no way suggesting a blueprint, but it contains many good ideas which may be adapted to any setting interested in approaching a realistic way of achieving improved quality care.

The approach is in essence simple and practical, not overwhelmingly time consuming and even fun in execution - a commodity missing from some of our earnest endeavours today.

Hazel O Allen
Associate Director
King's Fund Centre

September 1986

ACKNOWLEDGEMENTS

The work of the Quality Circle Monitoring Group (QCMG) was greatly enhanced by contributions from many sources. Whilst the contents of this manual have been reached by the Group after much discussion, drafting and re-drafting - our thanks for stimulation outwith the group must go to:

Sun Health Inc. North Carolina, for their generous donation of training manuals and materials which provided a starting point for our deliberations. Elinor Leonard, a former employee of Sun Health Inc. who gave every support and encouragement to this United Kingdom development. Hazel Allen, an Associate Director at the King's Fund Centre who gave us space and time to develop our own knowledge of Quality Circles, who shielded us from 'others' who wanted us to 'go public' before we were ready to do so and who, at times, provided an additional stimulus to our deliberations. To our managers for having the foresight to give us the initial impetus to be involved in this initiative and for their support throughout the development of the project.

Others who have contributed to our thinking and thereby indirectly to this manual: The University of Manchester Institute of Science and Technology; National Society of Quality Circles; Josiah Wedgwood and Sons Ltd; Rank Xerox U.K; Valdese General Hospital, North Carolina; The North Carolina Memorial Hospital; Durham County General Hospital, North Carolina and a number of Health Authorities in the U.K.

Members of the Quality Circle Monitoring Group
September 1986

INTRODUCTION TO QUALITY CIRCLES

A Quality Circle (QC) is a group of 3-10 individuals who work in the same ward/department/unit and who volunteer to meet together regularly to identify and solve in a systematic way, work related problems.

At first reading this statement might well produce a response of 'we already have regular meetings at which individuals can express their problems, why set up another meeting which will take them away from their work?'

A reasonable response but inaccurate because it implies that QCs are simply about expressing problems.

Looking at the statement in more detail reveals that the individuals....'work in the same ward/department/unit... ideally members should be from the same work area or do similar work or interact closely in their work so that the problems they identify will be familiar to them all. Also, at the reporting stage there should be a manager to whom the group report their findings and recommendations; a disparate group might well have difficulties in identifying the manager to whom they are accountable. The Health Service is fortunate in that it already has structures which allow for QC groupings i.e. wards, departments, units.

The number of individuals in a circle is significant - anyone who has been involved in working with groups will be aware that for participative group work, too few might hinder discussion and too many will allow some passenger members to be carried. The 3-10 allows for group interaction to take place and for all individuals to contribute to the work of the circle.

The statement goes on to clarify that members....'volunteer to meet together regularly....' This voluntary aspect is sometimes questioned i.e. how voluntary is voluntary? Infact, a workable interpretation of this 'free commitment' is that the individual is free to leave the circle if he/she reaches the point of thinking "QCs are not for me". A very good example of this individual freedom was seen in a BBC2 programme about the Wedgwood China Manufacturers, which outlined how even this prestigious company was hit by the recession and how they went about seeking their own route to recovery by investing in people. This investment involved developing QCs and one of the employees stated she had left her QC group because she felt...."it was too like being back at school..." In this particular instance, the individual re-joined the group a year or so later when she saw some of the beneficial results coming from the circle. In this example, leaving and later re-joining the group, was the decision of the individual - no pressure was made of feeling she had to stay in the circle.

The next part of the statement....'to meet together regularly....' might well produce the question of 'how regularly is acceptable?' Infact, this is a group decision but in general one hour a week is advisable. In the Quality Circles Digest of September 1984, a company with 8 circles preparing for expansion to more circles within the company, carried out a survey with members of the existing circles to find out the value and frequency of QCs. Two of the answers supported the weekly, one hour meeting:

> Hour long meetings are just right : 83% agreed
> Once a week meetings are just right : 74% agreed

Whatever the interpretation of meeting regularly, once the group members have agreed their time scale, it should be strictly adhered to. If the meeting is to be for one hour then any business not completed in the hour must be carried over to the next meeting - the contract for the frequency of meetings and their duration must be honoured.

....'To identify and solve in a systematic way work related problems....' i.e. not simply 'expressing problems' but, as a group, to identify and put in priority order the work related problems the group members wish to solve. This is a much bigger commitment than going to a meeting to voice one's problems; it involves communication, sharing ideas, seeking answers and doing it all as part of a group.

It is of paramount importance that the facilitators and circle leader receive preparation for their roles in guiding the circle members, hence this workshop and training manual, (circle members have these techniques passed on to them at circle meetings and use real problems and real situations in which they work). The need for preparation in QC techniques has been identified again and again and yet there are still those who believe a few hours infront of a training video tape or with a slide/tape programme is sufficient to organise QC preparation. In a UMIST paper A **further study of QC programmes in the UK Service Section'**, Lees and Dale corroborate this fundamental need for preparation when they state "It is now well documented that unskilled facilitation can be detrimental to the health of a QC programme."

QCs are not a panacea for solving all problems. They are a method of involving individuals in looking at their own areas of responsibility and of providing a structure which harnesses suggested methods of improvement by the people doing the job. QCs afford individuals the opportunity of developing their own abilities, they provide the means whereby each individual's unique ability/creativity can be recognised and used.

For management, the whole process means that colleagues for whom they are responsible are taking a more overt role in seeking solutions to their own difficulties. Such freedom pre-supposes that management will be actively and visibly supportive of the process - not in an intrusive way but by being responsive. Responsive in recognising the need for training in QC techniques for facilitators and leaders and later in acknowledging the need to re-charge batteries by encouraging facilitators and leaders to be involved at appropriate conferences and seminars. Responsive in recognising the need for a steering committee to give overall direction and guidance to the QC programme. Responsive in facilitating some of the basic requirements for QC meetings to take place e.g. in a room free of daily distractions, appropriate writing materials, typing support. Responsive in attending when a 'Presentation to Management' takes place and, later, in acknowledging the suggestions that have been presented - not with a blank cheque, but with considered weighting.

At the risk of stating the obvious, QCs are not the latest ploy; they are part of an open management style where there isn't a 'them' and 'us' divide and where trust is the cornerstone of the organisation. As such, QCs should not be seen as being grafted on as an additional appendage to the existing management style, rather as being transplanted into a system which already exists. A system which has been prepared, tissue-typed, cross matched and where the risk of rejection has been minimised; such a receptive system will be complimented and strengthened by the transplant.

Some doubting Thomas's may well raise the old chestnut that QCs are for manufacturing industries and whilst they work in Japan where they were first developed, what chance have they in a service industry in the West? In the Lees and Dale paper this question has been answered in the introduction: 'In all countries which have quality circles, they are introduced first into the manufacturing sector, then as the benefits are publicised and expertise is built up, different types of service organisations start to consider their introduction. The situation in the UK has followed such a pattern.' There are difficulties in setting-up QCs in an organisation like the Health Service and this should be recognised. For example, those staff working shift systems might have difficulty in finding a suitable time to meet. The work in the Health Service is so often interrelated with other departments that it might be difficult to identify problems which are sufficiently contained within the group that bringing their joint energies to the problem, data can be collected from which solutions can be recommended. As work in the Health Services is so interrelated with other departments, a solution for one might appear as a criticism of another hence the need for careful discussion before selection of the problem to be addressed. The selection and discussion might well involve experts outwith the QC group. On an ad-hoc basis those who are not members of the circle but have a contribution to make to the QC discussion, can be asked to share their expertise at a QC meeting. A 'plus' for QCs in the Health Service is that as QCs are about people involvement, and people resource in the Health Service is a reality therefore the NHS has one of the fundamental requirements for a QC programme.

> Small groups are, quite simply, the basic organisational building blocks of excellent companies. (Peters, T. J. & Waterman, Jnr. R. H.)

****

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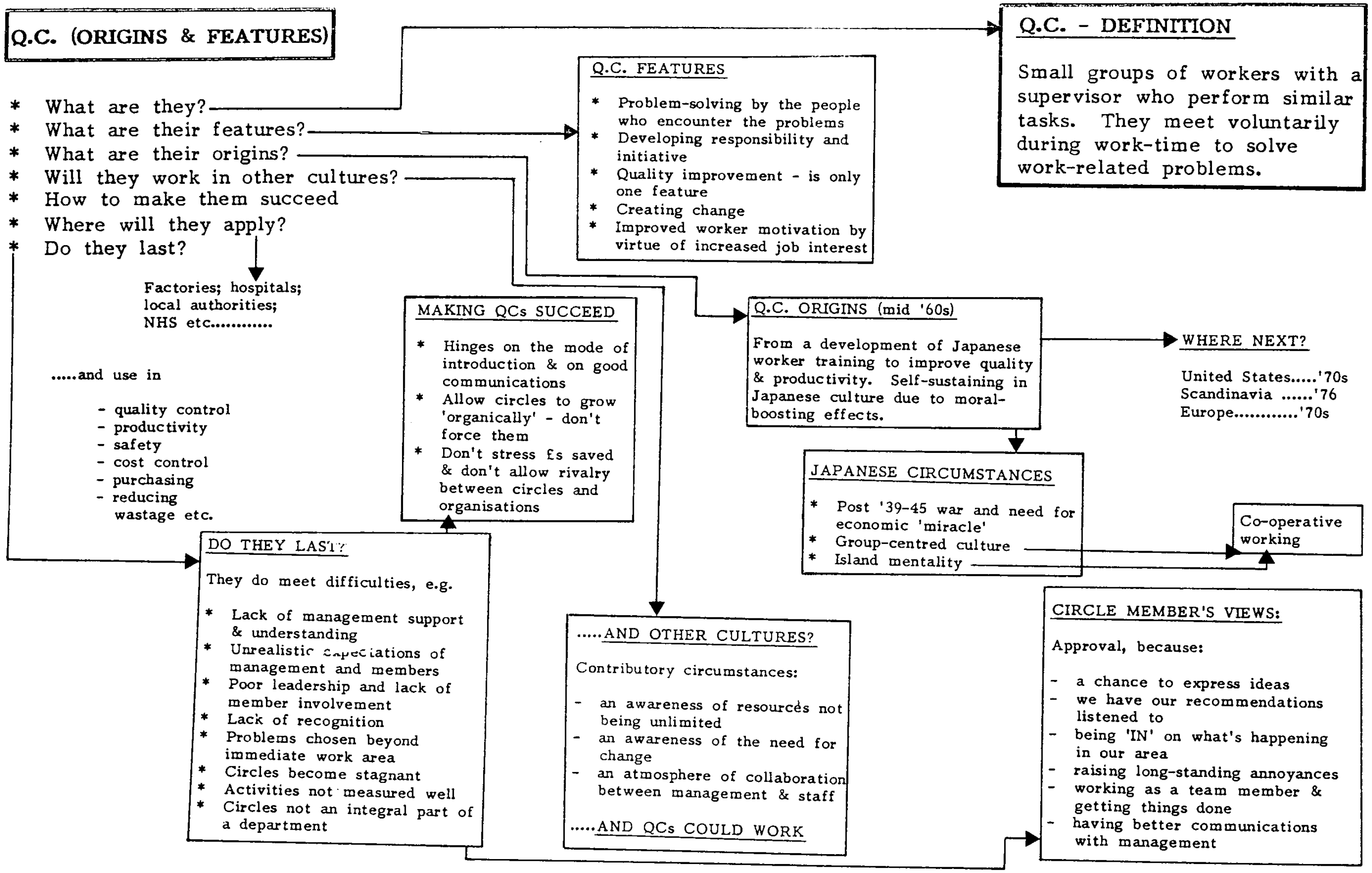
1. BBC2 programme 'Discovery' (1985). Written and narrated by Brian Redhead.

2. A Further Study of Quality Circle Programmes in the UK Service Sector. Lees, J. and Dale, B. G. Occasional Paper No. 8511 (Dec. 1985). Published by The University of Manchester Institute of Science and Technology.

3. In Search of Excellence - Lessons from America's Best Run Companies. Peters, Thomas J. and Waterman, Jnr. Robert H. (1982). Published by Harper and Row.

Christine Davies, Project Officer (Education and Training)
King's Fund Centre
September 1986



Q.C. (ORIGINS & FEATURES)

- What are they?
- What are their features?
- What are their origins?
- Will they work in other cultures?
- How to make them succeed
- Where will they apply?
- Do they last?

Q.C. - DEFINITION

Small groups of workers with a supervisor who perform similar tasks. They meet voluntarily during work-time to solve work-related problems.

Q.C. FEATURES

- Problem-solving by the people who encounter the problems
- Developing responsibility and initiative
- Quality improvement - is only one feature
- Creating change
- Improved worker motivation by virtue of increased job interest

Factories; hospitals; local authorities; NHS etc............

.....and use in

- quality control
- productivity
- safety
- cost control
- purchasing
- reducing wastage etc.

MAKING QCs SUCCEED

- Hinges on the mode of introduction & on good communications
- Allow circles to grow 'organically' - don't force them
- Don't stress £s saved & don't allow rivalry between circles and organisations

Q.C. ORIGINS (mid '60s)

From a development of Japanese worker training to improve quality & productivity. Self-sustaining in Japanese culture due to moral-boosting effects.

WHERE NEXT?

United States.....'70s
Scandinavia ......'76
Europe............'70s

JAPANESE CIRCUMSTANCES

- Post '39-45 war and need for economic 'miracle'
- Group-centred culture
- Island mentality

Co-operative working

DO THEY LAST?

They do meet difficulties, e.g.

- Lack of management support & understanding
- Unrealistic expectations of management and members
- Poor leadership and lack of member involvement
- Lack of recognition
- Problems chosen beyond immediate work area
- Circles become stagnant
- Activities not measured well
- Circles not an integral part of a department

.....AND OTHER CULTURES?

Contributory circumstances:

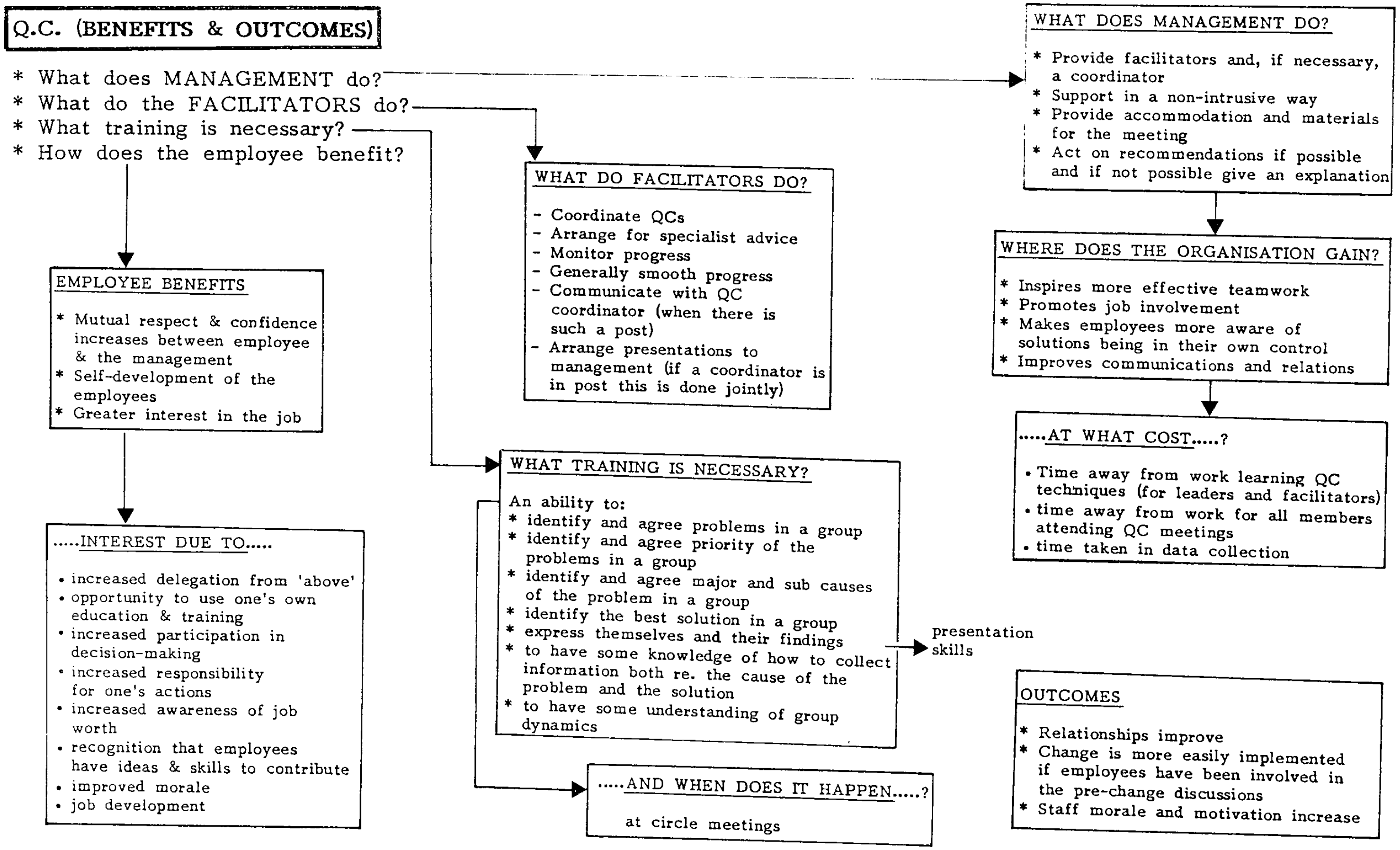
- an awareness of resources not being unlimited
- an awareness of the need for change
- an atmosphere of collaboration between management & staff

.....AND QCs COULD WORK

CIRCLE MEMBER'S VIEWS:

Approval, because:

- a chance to express ideas
- we have our recommendations listened to
- being 'IN' on what's happening in our area
- raising long-standing annoyances
- working as a team member & getting things done
- having better communications with management



Q.C. (BENEFITS & OUTCOMES)

- * What does MANAGEMENT do?
- * What do the FACILITATORS do?
- * What training is necessary?
- * How does the employee benefit?

EMPLOYEE BENEFITS

- * Mutual respect & confidence increases between employee & the management
- * Self-development of the employees
- * Greater interest in the job

.....INTEREST DUE TO.....

- increased delegation from 'above'
- opportunity to use one's own education & training
- increased participation in decision-making
- increased responsibility for one's actions
- increased awareness of job worth
- recognition that employees have ideas & skills to contribute
- improved morale
- job development

WHAT DO FACILITATORS DO?

- Coordinate QCs
- Arrange for specialist advice
- Monitor progress
- Generally smooth progress
- Communicate with QC coordinator (when there is such a post)
- Arrange presentations to management (if a coordinator is in post this is done jointly)

WHAT TRAINING IS NECESSARY?

An ability to:

- * identify and agree problems in a group
- * identify and agree priority of the problems in a group
- * identify and agree major and sub causes of the problem in a group
- * identify the best solution in a group
- * express themselves and their findings
- * to have some knowledge of how to collect information both re. the cause of the problem and the solution
- * to have some understanding of group dynamics

presentation skills

.....AND WHEN DOES IT HAPPEN.....?

at circle meetings

WHAT DOES MANAGEMENT DO?

- * Provide facilitators and, if necessary, a coordinator
- * Support in a non-intrusive way
- * Provide accommodation and materials for the meeting
- * Act on recommendations if possible and if not possible give an explanation

WHERE DOES THE ORGANISATION GAIN?

- * Inspires more effective teamwork
- * Promotes job involvement
- * Makes employees more aware of solutions being in their own control
- * Improves communications and relations

.....AT WHAT COST.....?

- Time away from work learning QC techniques (for leaders and facilitators)
- time away from work for all members attending QC meetings
- time taken in data collection

OUTCOMES

- * Relationships improve
- * Change is more easily implemented if employees have been involved in the pre-change discussions
- * Staff morale and motivation increase

From an original flowchart and with kind permission of B. J. McCallum

King's Fund Centre September 1986

QUALITY CIRCLES

1. BRAINSTORMING AND LISTING PRIORITIES

AIM: To evolve a simple technique for developing a priority listing of suspected problem areas or related concerns.

Introduction

Brainstorming is a technique used to generate ideas. It is one of the most important techniques used by quality circles, particularly in identifying problems or their causes of both good and poor quality. In fact, brainstorming may be used in any situation where it is necessary to come up with as many ideas as possible.

Outline of sequence for brainstorming

There are several techniques used for brainstorming, what follows is a suggested method for:

- generating ideas
- developing a technique for the group to agree priorities.

Writing down an idea gives it clarity and objectivity which is not always possible by just thinking of it, therefore, **circle members are asked to write down their ideas.**

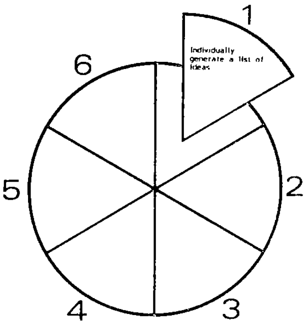
People do not necessarily think of their best ideas first, nor do they always think of ideas in logical sequence. Often a person will have no ideas during the first few minutes of 'thinking' then she experiences a flood of ideas, therefore, **circle members are given time to think and write.**

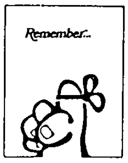
If ideas are allowed to be suggested as they occur to individuals, the group will focus its entire attention on those and so prevent other ideas from being generated.

When people are allowed to generate **ideas independently they are less inhibited, more productive and more creative.**

1. The circle leader should begin by giving a general introduction to the purpose of the meeting (as outlined above).

2. Allow 5-10 minutes for circle members to think independently and write down their work related problems and/or concerns.

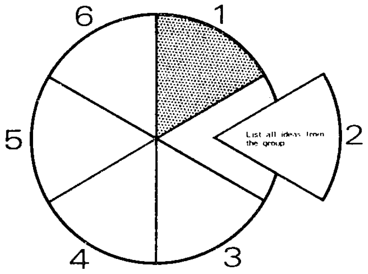




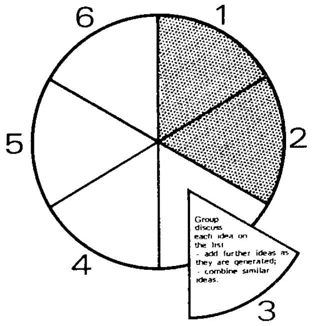
Remember these work related problems/concerns come from members and should not be imposed.

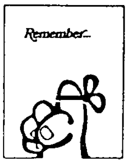
3. After about 10 minutes the leader should ask each member in turn for one idea from her list. Each idea should be written on a chart which is visible to all. There should be no discussion, comment or criticism at this stage.

   Listing should continue until all ideas have been written on the chart - the more ideas the better, no idea is useless.



4. Each idea should be discussed in turn and each member should be given a chance to comment. The leader should enable all members an opportunity to participate.



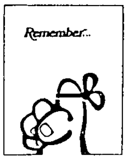


Remember, the dominant members of the group do not always have the best ideas.

5. During discussion, additional ideas are often generated. Also, an idea which appears to be 'useless' might provide the fuse to ignite an explosion of additional ideas. All additional ideas should be added to the list.

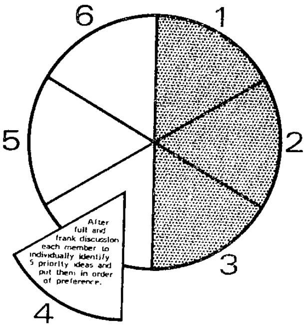
6. During discussion it might be agreed that some ideas are similar, if so, these can be linked together and treated as one.

7. During discussion it may become evident that some subjects are inappropriate or beyond the control of the group and these should be discarded.

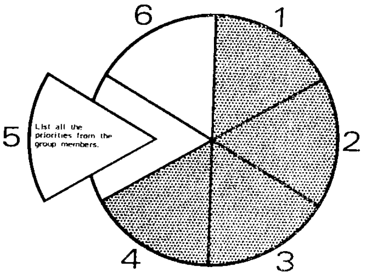


Do not rush the discussion period even if completing the discussion means holding over some ideas to the next meeting. It is vital that all members are given the opportunity to contribute fully and comment on the listed ideas.

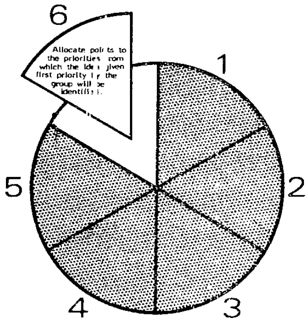
Outline of Sequence for Listing Priorities



1. When discussion and linking of ideas has been completed, members should be asked to write down independently their choice of the five ideas they consider to be the most important.



2. The circle leader should list these ideas on the chart. Where the same idea has been chosen by more than one circle member then, of course, the idea need be listed only once.

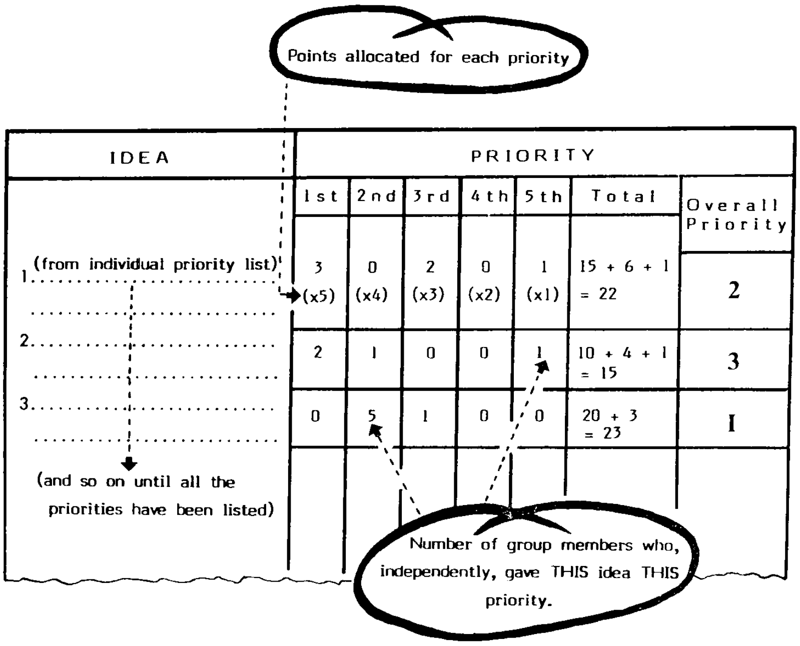


3. From the list each circle member casts her votes. This is done in priority order of 1-5.

4. In order to produce a summary of the priority order of the group, the leader allocates points to each priority from individual circle members, i.e.

1st priority on individual list = 5 points per vote
2nd priority on individual list = 4 points per vote
3rd priority on individual list = 3 points per vote
4th priority on individual list = 2 points per vote
5th priority on individual list = 1 point per vote

5. The summary of this sequence will look something like figure 1



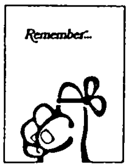
Points allocated for each priority

IDEA	PRIORITY					
	1st	2nd	3rd	4th	5th	Total	Overall Priority
1. (from individual priority list)	3 (x5)	0 (x4)	2 (x3)	0 (x2)	1 (x1)	15 + 6 + 1 = 22	2
2.	2	1	0	0	1	10 + 4 + 1 = 15	3
3.	0	5	1	0	0	20 + 3 = 23	1
(and so on until all the priorities have been listed)							

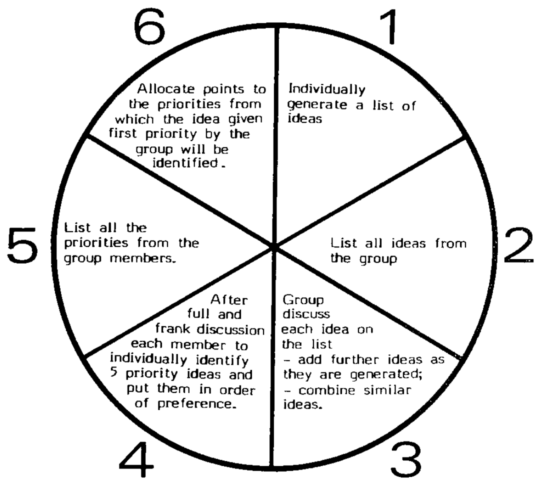
Number of group members who, independently, gave THIS idea THIS priority.

Figure 1 **Final summary chart of listing priorities**

6. When all the scores have been totalled, **the idea with the highest score is the preference of the group.** The idea with the next highest score is the second preference and so on. Using this method it is possible that the idea with the highest score was not the first choice of any circle member. However, as the total points from the group give it the highest score, this will be the idea the group will first work on.



Remember this method of brainstorming leading to the group agreeing its priorities is one of the most useful and powerful techniques used in quality circles.



4 - 6 Developing a technique for the group to agree priorities

1 - 3 Generating ideas

Figure 2 Summary of the stages in brainstorming and listing priorities

Additional Comments

The ideas generated during the brainstorming sequence should be kept and reference made to them when fresh ideas need to be looked at (although some ideas may be eliminated during the solving of earlier ideas).

At local level an audio visual programme may be developed using the outlines in this module. A slide/tape prorgamme, overhead transparancies, flip charts, or video programme could be developed.

Whilst it is important to follow the order of the sequences outlined, this format allows for local skills and local resources to be used by the facilitator and/or circle leader.

Further Reading: Rawlinson, J.G. Creative Thinking and Brainstorming. (Gower) 1981.

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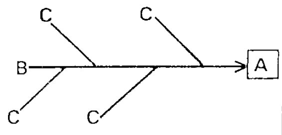
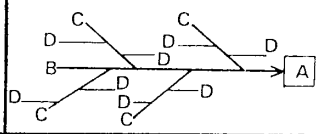
2. ANALYSING THE CAUSE OF THE PROBLEM (or CONCERN**)

(**throughout this module where 'problem' is used 'concern' may be interchanged)

AIM: To develop a technique which will help identify the causes of a problem.

Introduction

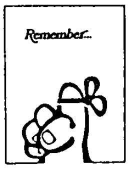
After selecting a problem the next stage is to find the cause. A Cause and Effect diagram will be used - this was first developed by Professor Ishikawa of the University of Tokyo in the early 1950s. Having agreed a top priority work related problem this has to be broken down and each contributing factor, explored. Figure 3 shows how the Cause and Effect diagram is constructed, and why it is sometimes called a 'fishbone diagram'.

	COMMENT	ACTION	DIAGRAM
A	Identify the effect, this is usually stated as the problem. Make sure it is clearly stated. Too often 'causes' are identified and not 'the problem'. This can lead to the cause being eliminated but the problem still existing.	Write the problem statement in a box on the right side of the page/flip chart/transparency	
B	This stage simply helps to focus attention on the problem being studied. The arrow might be seen as the spine of the fishbone.	Draw an arrow pointing towards the box.	
C	As a group, agree the major causes of the problem. The circle leader might ask members to jot down their ideas of major causes, using the brainstorming technique developed in Module 1. Usually 4 major causes are identified, but this number is not finite. Be sure the major causes are not subsidiary causes.	Add small 'bones' to the main spine. E.G. Major causes often used: Manpower/Staffing Machinery/Equipment Methods/Training Materials/Supplies	
D	As a group identify and agree subsidiary causes (again, using the brainstorming technique)	Connect the subsidiary causes with the appropriate major causes.	

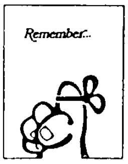
N.B. If you wish, instead of expressing the problem in the negative, phrase it in the positive; complete a positive Cause and Effect diagram and finally assess where the problem being studied falls short of the positive lay-out.

E.G. If the problem being studied is 'Poor Transportation to the Department' this could be put in Box A as: 'What Causes Good Transportation to the Department?' The final positive diagram can be used as a yardstick against which to measure the real problem.

Figure 3 Cause and effect diagram



It isn't always easy to know where to start when listing 'causes'. The leader might well use the Brainstorming Technique at this stage and ask circle members to identify what they consider are the major causes. It is important for the leader to allow only causes to be identified. When the major causes have been agreed, the subsidiary causes can then be identified using the same technique. No criticism should be allowed except to challenge a statement's validity as a cause.



It is easy for the group to start talking of solutions before all the subsidiary causes are listed. If this happens the leader should question whether the talking point is a cause.

Taking the example 'Poor transportation to the department' and entering it in the problem box as a positive question of 'What causes good transportation to the department?' The resulting cause and effect diagram might look something like Figure 4.

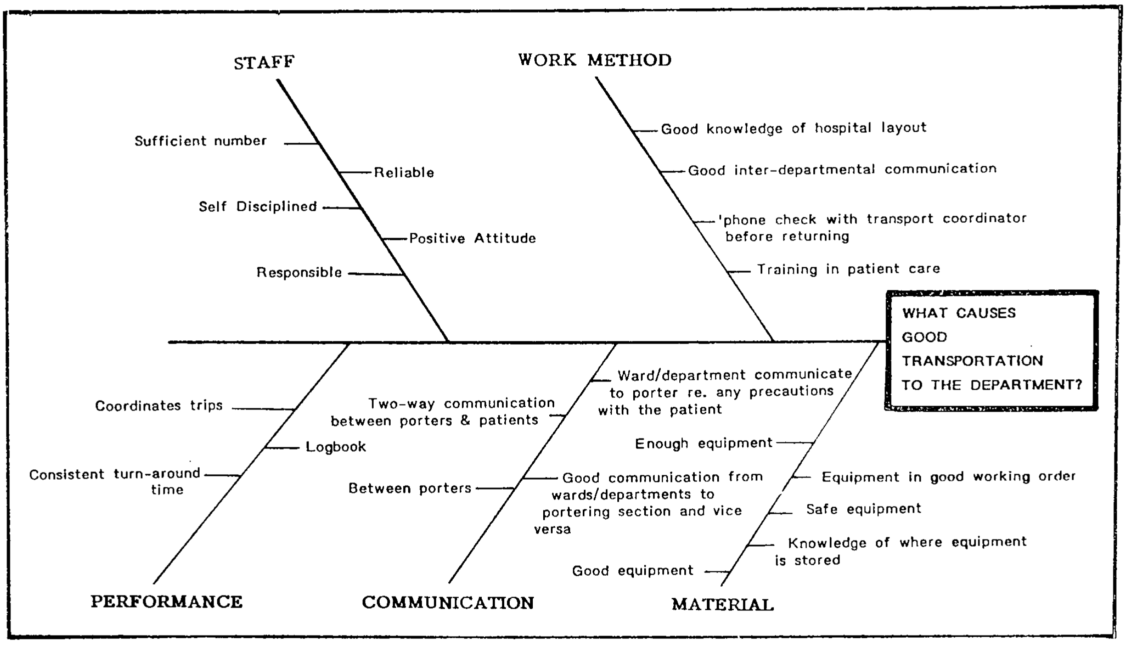
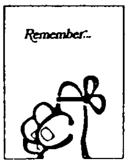


Figure 4 An example of a cause and effect diagram

Display cause and effect diagram

When the diagram has been completed with the problem clearly stated and with the major and subsidiary causes identified, the diagram should be displayed in a prominent place in the ward, department or unit for a few days. During this time anyone interested in the problem can be invited to add their suggestions. It will also serve to demonstrate that the Quality Circle meetings are open.

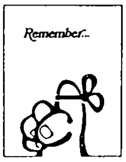


Many times the most obvious causes are not immediately apparent.

Collect further data

When the diagram has been completed, the major and subsidiary causes may be obvious however, additional study is often necessary to confirm that the causes agreed are those which contribute to the selected problem. This study will also help establish which causes are the major contributors therefore, compile a simple check sheet in order to collect data.

Each circle member should share the load of collecting data, carefully monitoring each occurrence of the problem being investigated and fill out the check sheet by putting a mark in the box each time 'a cause' occurs. It may be possible for this to be done by interviewing an individual or by observing for a specified period.



First of all decide what data is really needed.
Do not allow the data collection period to be too lengthy.
Do not make data collection too complicated.
The data collected will have to be collated.
The Q.C. members are investigating a problem with a view to taking action to reduce or solve it, data collection is a means to that end and not the end in itself.

CHECK SHEET

Date:..........................

PROBLEM. What causes GOOD transportation to a department?

Major Causes:	STAFF		WORK METHOD		PERFORMANCE		COMMUNICATION		MATERIAL	
Subsidiary Causes	Sufficient number		Good knowledge of hospital layout		Coordinates trips		Two way communication between porters and patients		Enough equipment	
	Reliable		Good inter-department communication		Consistent turn-around time		Between porters		Good equipment	
	Responsible		'Phone check with transport coordinator before returning		Logbook		Ward/dept c. to porters re. any precautions with the patient		Equipment in good working order	
	Self Disciplined		Training in patient care				Good c. from wards/depts. to portering section and vice versa		Safe equipment	
	Positive Attitude								Knowledge of where equipment is stored	

(leave blanks in each column in case unexpected causes are identified)

Figure 5 An example of what a check sheet might look like

When the agreed period for data collection is completed, a summary sheet of the findings should be drawn up using either the check sheet or the original cause and effect diagram. The summary will show the **frequency** of each major and subsidiary cause for the problem being studied. A further outcome from this information will be that the **priority** of each cause can be ranked.

The summary check sheet for 'What causes good transportation to a department?' could be developed by asking porters, ward staff, departmental staff and patients what they consider contributes to good transportation to a department. So that a number of choices are made by individuals it is probably wise to limit the number of ticks for each individual. A summary check sheet might then look like Figure 6.

CHECK SHEET

Date:..................

PROBLEM. What causes GOOD transportation to a department?..................

Major Causes:	STAFF		WORK METHOD		PERFORMANCE		COMMUNICATION		MATERIAL	
Subsidiary Causes	Sufficient number	𝍸 𝍸	Good knowledge of hospital layout	𝍸 II	Coordinates trips	𝍸 I	Two way communication between porters and patients		Enough equipment	𝍸 III
	Reliable		Good inter-department communication		Consistent turn-around time		Between porters		Good equipment	
	Responsible		'Phone check with transport coordinator before returning		Logbook		Ward/dept c. to porters re. any precautions with the patient		Equipment in good working order	𝍸 III
	Self Disciplined		Training in patient care				Good c. from wards/depts. to portering section and vice versa	𝍸 I	Safe equipment	
	Positive Attitude								Knowledge of where equipment is stored	

(leave blanks in each column in case unexpected causes are identified)

Figure 6 An example of a summary check sheet

From the data collected on the summary check sheet it can be seen that the order of priority for 'What causes good transportation to a department?' is:

1 Sufficient number of staff (10 ticks)
2 Enough equipment (8 ticks)
2 Equipment in good working order (8 ticks)
4 Good knowledge of hospital layout (7 ticks)
5 Coordinates trips (6 ticks)
5 Good communication from wards/departments to transport section and vice versa (6 ticks)

The priority order can either be marked on the check sheet summary or on the original cause and effect diagram (see Figure 7).

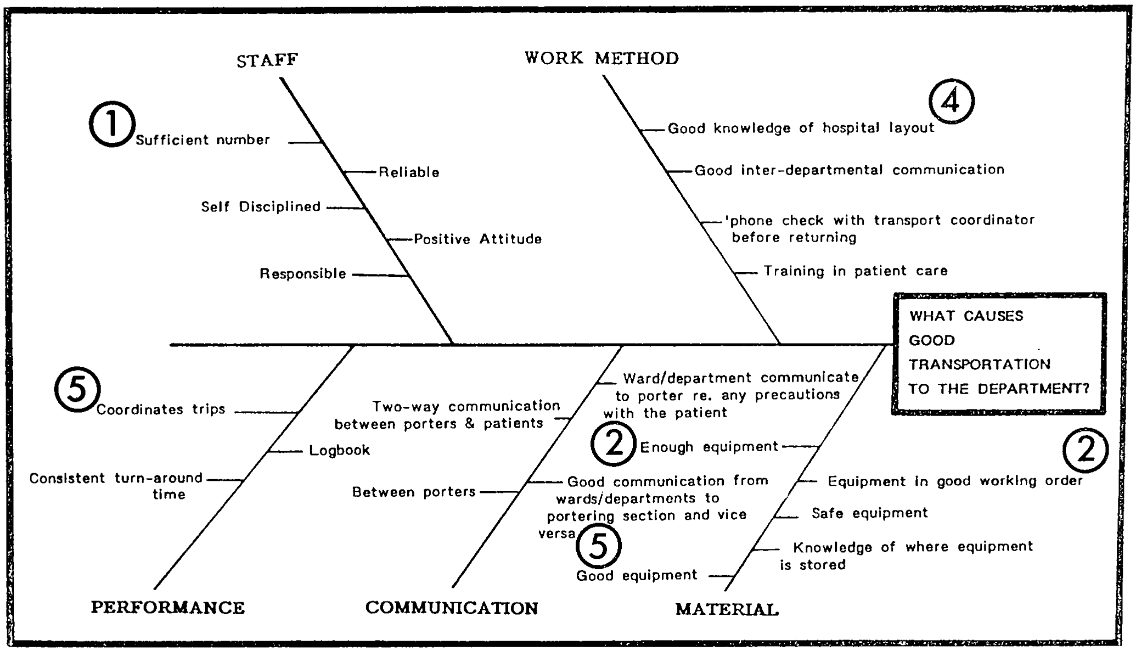


Figure 7 After data collection priority of causes for this problem

Sharing the outcome of the data collection

The summary sheet or the summary on the cause and effect diagram should be put in a prominent place for colleagues to see the outcome. Focussing attention on the problem and its causes in this way is often sufficient to solve the problem within a few days of posting the information. If this outcome does not become evident or is anticipated as being insufficient action to solve the problem, then module 3 should be followed in order to:

DEVELOP CREATIVE SOLUTIONS

Additional comments

A cause and effect diagram is sometimes called 'A fishbone diagram' or 'An Ishikawa diagram'.

Going back to what was stated at the beginning of this module:

> If the problem being studied is 'Poor transportation to the department' this could be put in box A as 'What causes good transportation to the department?' the final positive diagram can be used as a yardstick against which to measure the real 'negative' problem.

From the data collected for good transportion the yardsticks to be used are:

1. Is there a sufficient number of portering staff to respond to the requirements of the wards/departments? (This consideration may be outwith the ability of the Quality Circle and management may, for example, consider a workstudy).

2. Is there enough equipment for porters and is it in good working order?

3. Do the porters have a good knowledge of the hospital layout?

4. Do the porters coordinate their trips thereby making optimum use of their time?

5. What methods of communication are there from the wards/departments to the transport section and vice versa?

Major Causes. The four 'Ms' are often used (Machine, Manpower, Materials and Methods) however, these may not always be applicable to the problem being considered and the Quality Circle may have to brainstorm major causes e.g. for a gardening problem the four major causes might be Soil, Seed, Equipment and Environment; a health service problem might fall more easily into the categories of Equipment, Staffing, Training and Supplies.

****

3. DEVELOPING CREATIVE SOLUTIONS

AIM: To generate as many creative solutions to the problem as the group are able to identify. To be aware of difficulties that may occur when a group is trying to find solutions to a problem.

Introduction

As outlined in Module 1, Brainstorming is a technique used to generate systematically as many ideas as possible. This technique was also used when the causes of a problem were being identified and will also be used to produce a list of creative solutions. Before Brainstorming this list it is necessary to understand some of the difficulties people have with developing creative solutions.

A. Difficulties in developing creative solutions

One difficulty for circle members is dealing with **mental blocks** which keep them from:

- correctly perceiving the problem, or
- finding its solutions.

Everyone has mental blocks but most people are not aware of them. During this module these blocks will be discussed, examples given and causes explored.

Mental blocks are obstacles that prevent people from clearly seeing:

- the problem, or
- the information necessary to solve the problem.

1. Difficulties arise when a QC **defines a problem too closely** thereby limiting perception and understanding and, further, limiting creative solutions. The more broadly a problem can be stated, the more room there is for creative thinking. For example, if the problem is stated as:

'Find ways of getting to the other side of the wall'

the mental block might limit one's thinking of **ways through the wall** and not **getting to the other side,** which is the ultimate purpose of finding the different ways. The resulting **limited** solution might look like those illustrated in Figure 8.

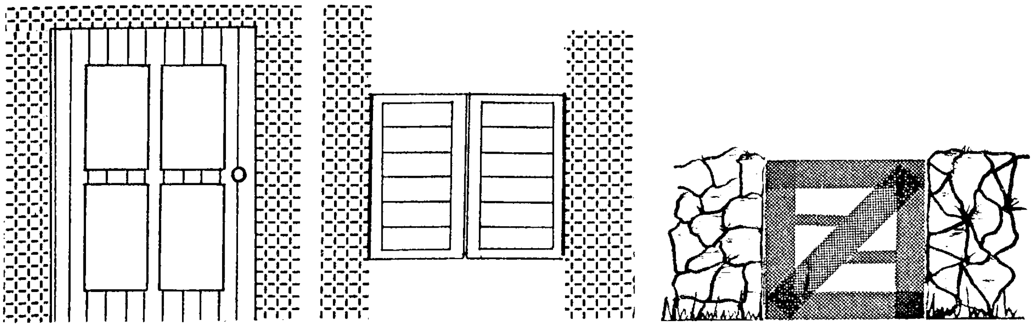


Figure 8 **Limited solutions for getting to the other side of the wall**

However, if the problem had been stated as:

'Finding ways of getting from one side of the wall to the other'

thereby removing the mental block of having to go **through** the wall, the imaginative solutions illustrated in Figure 9 might have resulted:

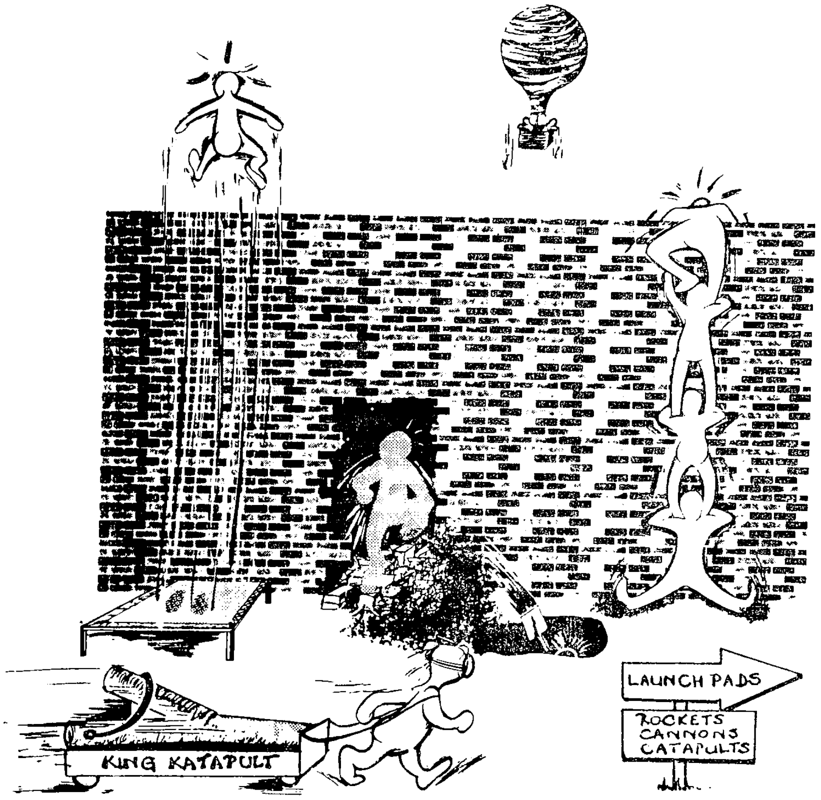
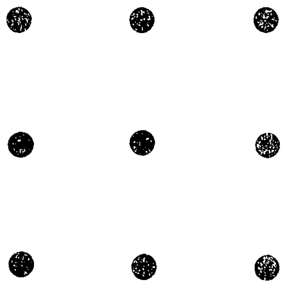


Figure 9 **Imaginative ways of getting to the other side of the wall (not all practical solutions but certainly creative!)**

Another illustration of a mental block often occurs when one asks:

- join these nine dots together
- use four straight lines
- do not remove the pen from the paper



The chances are, the person being asked will:

a. know the answer straight away because she has come across the problem before.

b. be stuck, because although she has come across the problem before but can't remember the answer.

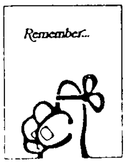
c. immediately impose mental blocks on the problem in that the layout of the dots suggests an area in which to work; the four straight lines compound the thought of the area in which to work - a square, **BUT** need this be so?

If you have reached point c. look at the problem again and try to determine which aspects you can broaden out:

- join these nine dots together
(can't really broaden these out, however much the **scale** of the dots was increased, the proportion would be the same)

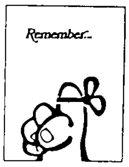
- using four straight lines
(nothing about the **length** of the lines, nothing about the four straight lines **in a square** therefore any length of lines, and they don't have to be in a square might help to broaden your thinking of a solution)

A possible solution is at the end of this module.



Unnecessary difficulties arise when a problem is defined too closely. The more broadly a problem can be stated, the more room there is for creative thinking.

2. When working on a QC problem it is always important but sometimes difficult to see the problem from the **viewpoints of all circle members.** Consideration of everyone's viewpoint however, can lead to a better solution of the problem.



The dominant member does not always have the best idea.

3. **Stereotyping** is another difficulty which might arise when using the problem solving technique. Stereotyping in this context is used as the **opposite to creativity.** When trying to generate creative solutions group members are trying to **imagine** and **sometimes combine** many possible solutions. In their stereotype form the solutions might appear to have no connection whatsoever but together in a creative form, they could take on quite a different meaning. For example, if the problem is:

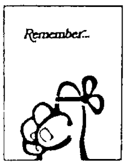
> 'Locked out of the house. Front door key on the inside of the key hole'

Possible solutions:

Magazine Credit Card Stiff wire	In their stereotype form, these items may appear to have no connection with opening the door, however in their creative form:

Credit Card:	The credit card 'door key' for some locks is a well known alternative use of the plastic card.
Magazine and stiff wire:	Push the magazine under the door frame so that most of it is inside; poke the key out of the key hole with the stiff wire so that it falls onto the magazine inside the house; gently pull back the magazine with the key on it.

Creative solutions to problems are sometimes brought more sharply into focus when 'usual' resources are limited; for example, on some survival courses when individuals have to draw on their inner resources, their ability to adapt and use what materials are available has a direct effect on their ability to survive. This ability to find creative solutions to problems was well illustrated in a TV series in which small groups of individuals were given equipment at different stages in a 48-hour survival period. At each stage there was a written clue to take them on to the next clue; also at each stage there were disparate objects which, using their personal knowledge and ingenuity helped them to the next clue. (From the comfort of an armchair it was fascinating to see how different groups used the same resources)



In their stereotype form the solutions might appear to have no connection whatsoever but together in a creative form, they could take on quite a different meaning.

4. **Obvious solutions** often do not occur to you. You become so familiar with an item that you no longer notice all the details.

To prove this to yourself, from memory draw a telephone dial and put in the numbers. Few people can do this exercise successfully even though they have used a telephone for a large part of their lives.

5. Another reason for failing to find the best solution is that the group do not use **all of their senses:** sight, sound, taste, smell and touch. It is important to consider using all of these, although most people concentrate on sight and sound i.e. vision and voice. For an example of using all senses to assess the quality of a product think of wine tasting. The sense of taste appears to be the most obvious to use but sight and smell senses play an equally important role.

6. **Cultural and environmental factors can also create blocks.** Cultural blocks are acquired by exposure to a given set of cultural patterns. Some examples are:

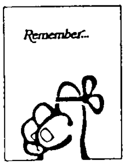
- playfulness is only for children
- reason, logic, numbers and practicality are good
- feeling, intuition and pleasure are bad
- tradition is preferable to change.

Environmental blocks are imposed by our immediate social and physical environment. Some examples of environmental blocks are:

- distractions (telephone ringing; bleep being answered; floor polisher at inopportune time...)

- lack of co-operation and trust among co-workers ("why bother, we're closing the hospital"...."transport has always been at that time, it'll take a month of Sundays to change it"....)

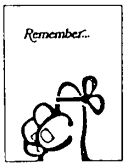
- lack of support for bringing ideas into action ("we tried it 10 years ago, it didn't work then and I don't see why it should work now"... "they won't have the money for it"...)



A system that doesn't allow for change will mean that ideas will not be generated as the system cannot be changed.

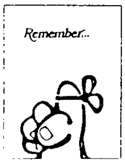
7. Each circle member encounters some **emotional blocks.** Creativity is risky and new ideas are hard to evaluate. The expression of a new idea and convincing someone else it has value can make one feel foolish, i.e. the individual is doing something that may make her vulnerable to criticism. To prevent this feeling, people often avoid suggesting new ideas. Probably the most common kind of emotional block is the fear of taking a risk, making a mistake or failing. Most of us have grown up rewarded when we produce the right answer and punished when we made a mistake. When one produces and tries to sell a creative idea there is a risk of:

- making a mistake
- failing
- looking foolish
- losing money
- hurting oneself



The solution of a problem is a complex process especially when done by a group. One must often deal with misleading and incomplete information, difficult to test ideas, opinions and values. The desire for order and the ability to tolerate some chaos in the process are both necessary.

7.1 The next emotional block is **a preference for judging ideas, rather than generating them.** Judgement, criticism, and practicality are essential in problem solving. However, if applied too early or indiscriminately in the process, they are counterproductive. If judgements are made too early many good ideas will be rejected. Delaying judgement does not come easily to most people because we are taught to be severe critics of anything impractical, unrealistic, or socially frowned upon. We don't even want to admit to ourselves that such thoughts exist.



Many good ideas might start out as frivolous ideas.
It is only after considerable thought that they are properly developed.

7.2 The final type of emotional block is the **inability to relax and 'sleep on' an idea.** The unconscious mind plays an important role in problem-solving. Everyone has had the answer to a problem suddenly occur in their mind, sometimes too late.

One must allow the unconscious to struggle with problems. It is important to be able to relax in the midst of solving problems. If an individual is never relaxed it is difficult to think creatively.

8. It is important to use the most appropriate method of expressing oneself. For example, it may be necessary to be creative in the choice of method used to present results e.g. graphs, drawings, three-dimensional models.

B. Overcoming difficulties in developing creative solutions

So far in this module mental blocks have been discussed and illustrated. The remainder of this module will be concerned with **overcoming these blocks.** It will be shown that there is a need to:

- use alternative thinking;	- become more mentally agile;
- become more relaxed;	- become less critical.

1. **The first step towards overcoming mental blocks is to identify them.** One of the most important attributes in a creative persons is a **questioning mind.** Everyone has a questioning mind as a child because of the need to assimilate an incredible amount of information in a few years but we tend to lose our questioning mind as we grow older. If we accept the status quo without question and we cannot see needs or problems, then we have no reason to come up with something new. There are two principle reasons for this:

   a. We are discouraged from enquiry. After a child reaches a certain age, parents and others are not as patient with questions.

   b. As we grow older we learn that a question admits that we don't know or understand something, and therefore feel threatened.

It is possible to train oneself to have a questioning mind. A good way is to create lists as thinking aids. List making is surprisingly powerful. It uses the compulsive side in most of us that makes us productive thinkers. List making is used when developing creative ideas to a problem. For example, if one sets a goal for coming up with ten ideas for the use of a credit card excluding the legitimate uses for a credit card it might prove a struggle to fill in all ten places (ideas that could be included in such a list are at the end of this module).

2. Another technique for creative thinking is **lateral thinking.** Lateral thinking is well documented in other publications notably in the Edward de Bono series; briefly however, the following are steps that might be taken in order to develop an ability to think laterally:

a. List the attributes of the situation.
b. Alongside each attribute, place as many alternatives as possible.
c. When completed, make random runs through the alternatives, picking up a different one from each column and assembling the combinations into entirely new forms from the original subject.

For example, imagine one wishes to improve a ball point pen. An initial reaction might be 'impossible' - the basic components of a ball point pen cannot be changed therefore the pen cannot be changed. However, following the three stages listed in the previous paragraph:

ATTRIBUTES	**ALTERNATIVES**
1. Cylindrical	Square, Beaded, Faceted, Spherical
2. Plastic	Metal, Glass, Wood, Paper
3. Separate Cap	Attached Cap, No Cap, Cleaning Cap, Retracts
4. Steel Cartridge	No Cartridge, Permanent Cartridge, Paper Cartridge

One random run through the alternatives could provide an imaginative ball point pen:

Square, Wood, No Cap, with a Paper Cartridge.

What would this pen look like?

Remember...

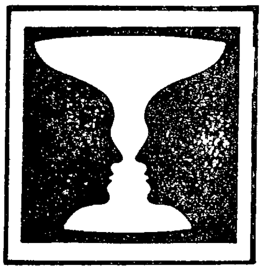
Never assume everyone sees things in the same way or that everyone sees what others see.

An alternative way of thinking is by visualizing a picture in our mind. In solving problems where shapes, forms or patterns are concerned, visual thinking is a more appropriate method to use. One way to develop visual thinking abilities is to practice drawing:

Remember...

The telephone. Would you have had difficulties recalling the dial if you had drawn it several times before being asked?

Once you draw things you will really start seeing them. The clarity of the images in our minds depends on our ability to see in the first place. For example what does the following outline illustrate?

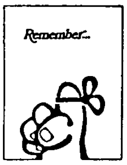


Some might see a vase, others might see two faces looking at each other. The point being made is when looking at a problem, different people will see it from different angles and it thereby follows that different solutions will be forthcoming.

Remember...

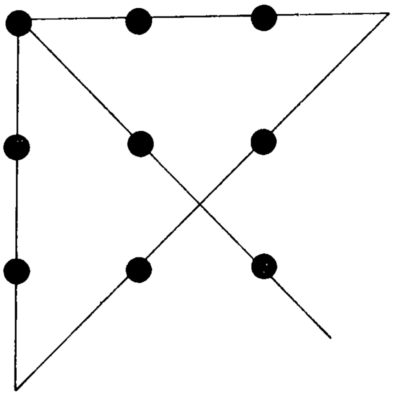
Often Quality Circles have to work through chaos in order to achieve shared ideas or solutions.

Delaying judgement does not come easily to most people because we are taught to be severe critics of anything impractical, unrealistic or socially frowned upon.



Many good ideas might start as frivolous suggestions. It is only after considerable thought that they are properly developed.

POSSIBLE SOLUTIONS



Ten ideas for a credit card:

1. Scraper
2. Book Marker
3. Gardening implement
4. Ruler
5. Tooth pick
6. Paint guard
7. Paper knife
8. Glass mat (coaster)
9. Palet knife
10 Splint for finger/thumb

Additional comments/Further reading

de Bono E. The Use of Lateral Thinking. Pelican Books Ltd
de Bone E. Lateral Thinking for Management. McGraw Hill Book Co (UK)

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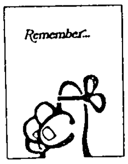
4. CHOOSING THE BEST SOLUTION

AIM: To develop ways of choosing the best possible solution from a list of alternatives.

Introduction

At this stage the Quality Circle will have developed a list of possible solutions to the problem in hand. It should be easy to see that some of the ideas listed are definitely out of the question. They may be unworkable, very costly or inappropriate. These particular alternatives may be crossed off the list without further discussion.



Circles should always work to develop solutions which they can implement.

Such solutions may be approved by the head of department and, therefore, would not need sanction by more senior management or the cooperation of other departments. If this can be achieved by the Circle without reference to others, implementation can begin right away.

In a complex organisation such as the Health Service, it will be inevitable that some problems and solutions will involve and affect other disciplines and departments e.g. a change in the nurses' shift patterns will involve not only the nursing staff but will affect the catering, transport and domestic departments. Therefore, when considering solutions which involve other departments it is imperative to have the approval and cooperation of that department to ensure successful implementation of the solution i.e. telling others how to organise their work is walking in dangerous territory. Sensitivity and awareness to the feelings of others can prevent them taking a negative viewpoint which may lead to sabotage (conscious and unconscious) of the circle's efforts.

There are three considerations a Circle must bear in mind in choosing the best solution:

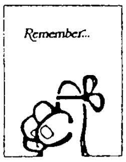
1. Consider **the probability of success of each solution**
2. Consider sensitively **the interest and involvement of others**
3. Consider **the costs** of each alternative solution (not always a direct financial cost; for example, it may be a cost in time) and compare them with cost reductions and/or other benefits resulting from the quality improvement.

1. Probability of success of each alternative

In choosing the best solution, it is necessary to consider the probability of success of each solution.

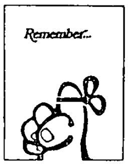
a. It may be that none of the solutions will work all the time
b. The group may be uncertain as to how well the solution will work
c. There may be some chance that the solution will not work at all but, if it does work, it will do so exceptionally well
d. Another possibility are solutions which will work in some cases but not in all cases.

To test out a possible solution, a pilot study may be the only way to find out if it will work. Depending on the results of the pilot study, modification of the solution may have to be made before presentation.



Think flexibly, some solutions could be more workable than others.

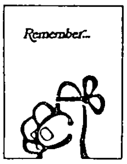
A pilot study and/or data collection to make an estimate of the results may seem a waste of time, but it is time well spent particularly when trying to convince management. (Data collection guidelines in Module 5)



There is no one best way to analyse all the possible solutions to all different problems. The techniques used will depend on the situation.

2. Interest and involvement of others

Another consideration in choosing the best solution, is to take account of the opinions of other decision makers or interest groups. These interest groups are other people or departments who may be affected by the results of your choice of solution.

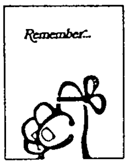


Telling others how to organise their work is walking in dangerous territory

Ideally, a Circle should only solve problems which implicate their ward, department or unit and do not involve others outside this sphere. However, in a complex organisation where the work of one area is closely interrelated with others, solving problems which are contained within the Circle, may be difficult. When other wards, departments or units are implicated in the problem which the Quality Circle group is attempting to solve, the chances are that colleagues in these other areas will have been made aware of the group deliberations, when Quality Circle members were analysing the cause of the problem and collecting facts.

At this stage of looking for **the best solution,** Circle members will need to test out - possibly with a small pilot study, the different solutions. Having collected relevant information for the different solutions to the problem, the Circle members should then discuss the potential solutions with colleagues who will be affected by any recommendations which come from Circle members. The discussion with other colleagues could be either at a Quality Circle meeting or at a mutually convenient time. If Circle members have systematically completed each stage of the Quality Circle process, this will be the time when the factual data will, almost, speak for itself. The Circle members should be able to demonstrate the best solution using the results of their analysis of the problem, their subsequent list of alternative solutions and the reasons for their final best solution.

When presented with factual information, most reasonable people will accept the recommendation for the best solution, however, there is always the possibility that some individuals or groups may present an impasse to any suggestions for solving the problem. Such a negative stance may be due to several reasons, for example any suggestions for solving a problem may be seen as a criticism of the current situation also any suggestions for change may be seen as threatening. This situation should not arise if management commitment to Quality Circles is fully recognised and seen as part of the total management philosophy of employee involvement and participation in the work of the Health Authority. However, when the leader or facilitator cannot negotiate the best solution with other departments or disciplines then the Steering Committee would have to consider ways of dealing with the situation.



Don't go it alone - involve all other groups and disciplines that the decision might affect. Failure to involve others could lose credibility and cooperation later.

3. Cost implications

In considering the projected results of each solution, the circle members must be aware that there are many ways a solution could have cost implications for the Health Authority. For example, if a solution will save time or reduce extra work for the staff, then it is possible to determine a monetary value for the benefit of a particular solution. However, it must be remembered that the most expensive or the cheapest may not be **the best.** Alternatively some benefits may be difficult to translate into financial terms e.g. reducing the waiting time for patients, decreasing pain or discomfort for patients - all desirable qualities but more difficult to value.

The simplest and usually the most useful method in considering the projected results of a solution is to compare the cost of implementing the solution with the benefits to be derived i.e. a Cost Benefit Analysis. Most

of us probably make this type of cost : benefit consideration when, for example, we buy a car, or a washing machine. Such questions as 'will the cost of the washing machine outweigh going to the launderette?' are part of the consideration. From the number of washing machines in use, it would appear that the benefits do outweigh the costs even with the maintenance and repairs needed for domestic machines. Also with a car a cost benefit consideration has to be made - car owners will often agree that keeping a car on the road is definitely an expensive way to travel however, the number of cars on the road would, again, indicate that the benefits are more than the costs.

It might be useful to construct a cause and effect diagram to identify all the possible costs and benefits which would result from each alternative solution.

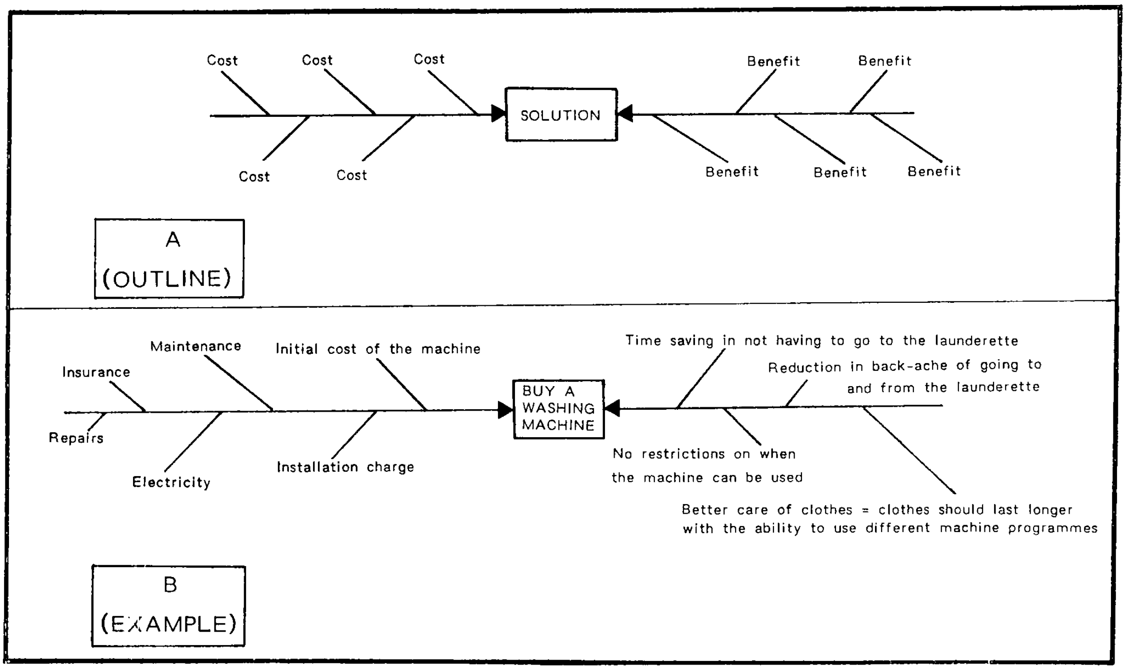


Figure 10 Cause and effect diagram for a cost:benefit analysis

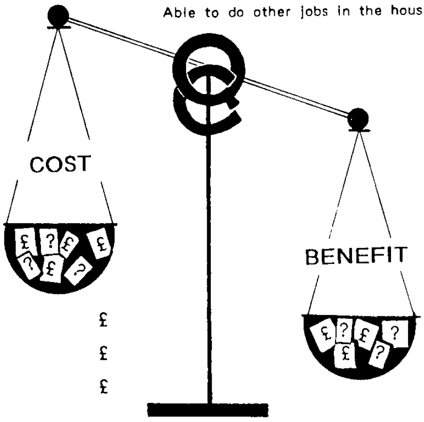
To put financial figures on some of the information in the example of 'Buy a Washing Machine' might still make it difficult to argue in financial terms alone the case to buy a washing machine. There are different ways of looking at the same solution. Those wishing to buy a machine will include benefits of 'doing things in the house while the washing is being done'. Those wishing to use a launderette will argue that getting out of the house and meeting others or reading at the launderette, are benefits. In a Quality Circle **a group** is looking at the solution therefore the solution will be from several viewpoints which should increase the thoroughness of the decisions. Really, all one is asking is:

IS THE COST WORTH IT?

and acknowledging that some costs will not have a monetary value but will be based on subjective judgement.

e.g. A WASHING MACHINE may have some of the following cost:benefit values - both monetary (£) and non monetary (?)

Time saving in not having to go to the launderette	£
Less aches from carrying heavy loads = less analgesics	£
Better care of clothes = last longer	£
Convenience	?
Able to do other jobs in the house at the same time	?



Initial cost	£
Installation	£
Possible alteration to kitchen	£
Annual running costs:	
Insurance	£
Maintenance and Repair	£
Electricity	£
Spending more time in the house	?
Less Opportunity to meet others	?

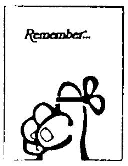
****

5. DATA COLLECTION

AIM: To demonstrate different methods of data collection which may be used by a Quality Circle.

Introduction

One of the requirements of Quality Circles might be to collect facts about the causes of a problem and not to rely solely on impressions or opinions. However, as stated in Module 2:



'First of all decide what data is really needed.
Do not allow the data collection period to be too lengthy
Do not make collection too complicated
The data collected will have to be collated
The QC members are investigating a problem with a view to taking action to reduce or solve it, data collection is a means to that end and not the end in itself.'

Module 2 also states:

> 'Each Circle member should share the load of collecting data, carefully monitoring each occurrence of the problem being investigated and fill out the check sheet by putting a mark in the box each time 'a cause' occurs. It may be possible for this to be done by interviewing an individual or by observing for a specified period.'

Each member sharing the load of collecting data may not be relevant every time, when this is so, Circle members might agree to miss a Circle meeting and one member could use the time to collect relevant data for a shift or a day.

Continuous Sampling (100%)

In the example given in Module 2, 'Poor Transportation to the Department' monitoring each occurrence of the problem might be very time consuming. It would involve asking **every** porter involved in transportation relevant questions. It would also involve asking relevant questions of **every** ward or department involved with transportation over the specified period; and, of course, where possible **every** patient transported during the specified period should be asked relevant questions. Not only would this be time consuming in data collection it would also be time consuming in summarising the results. A more feasible method of data collection, in this instance, might be random sampling.

Random sampling

Random sampling says 'a small piece of the whole will give a reasonable representation of the whole'. There are different ways of conducting this type of sampling but whatever method is used:

- every item has an equal chance of being selected as a sample
- there is no human bias in the selection of the sample
- the sample can be repeated

The very obvious example of random sampling in the Health Service is a blood sample: - a few millilitres of blood to give a picture of the whole of the circulatory system. No human bias is involved as to which few millilitres are taken and if a second sample is required, this is possible.

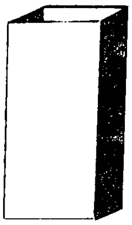
One way of conducting a random sampling is to use a wide based box and 100 strips of paper. For a 10% sample 10 of the strips would be marked in some way to distinguish them from the unmarked strips. All the papers should be folded and put in the box. The folded papers should all look and feel the same so that when a piece of paper is taken from the box, there is nothing which makes one piece of paper different from the others i.e. no bias in which paper is taken.

To random sample the problem of 'transportation to the department' a strip of paper would be removed from the box when the request for transportation was received. If the paper was marked, then that trip would be monitored. Alternatively, if it is thought that a bias might be given to that trip as one 'which is being monitored' then there is no reason why taking a strip of paper from the sample box could not be done after the trip has been concluded.

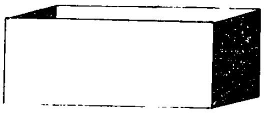
Of course, if the paper has no marking on it then the waiting time for that patient is not monitored.

One important point to remember is that after they have been picked out and looked at, ALL strips of paper are re-folded and put back into the box - this is so that the 10% ratio is kept constant throughout the period of random sampling.

Another small, but important detail in this method of random sampling - is the size and shape of the container used:

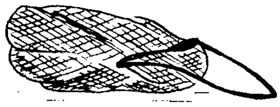


Taking strips of paper from this box may mean that paper at the bottom will have less chance of being picked out than those nearer the top.



This shape box allows access to all the strips of paper however there may be a bias to select from the corners or by avoiding the corners.

The rounded base of the bowler hat eliminates any 'corners' bias.



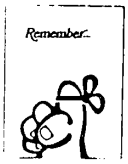
The strips of paper in a string bag can be shaken and thoroughly mixed between each random sample.

A combination of complete and random sampling

In the example already given, it might be considered that a questionnaire for all portering staff to complete would be feasible, with a random sample of the trips and the relevant wards or departments. Alternatively, a questionnaire to all wards and departments related to any portering during a specified period might be feasible, with a random sample of the trips and relevant porters.

Summary:

Data collection takes time to plan, to carry out, to collate and to evaluate. Although collecting facts is essential for many problems which a Quality Circle identifies, careful planning before going ahead with collecting data, is time well spent.



Whatever the method of data collection:- charts, check sheets, etc. should be clearly dated.

Additional information:

The following brief outline describes an advocator of the use of objective data and some of the current applications.

PARETO (1843-1923)

Vilfredo Pareto was an Italian economist who lived during a time of major re-evaluation of social, political and economic systems. Today Pareto would probably be known as a lateral thinker, one who 'seeks new ways of looking at a problem and does not merely proceed by logical steps from the starting point of what is known or believed' (Chambers 20th Century Dictionary). For example, Pareto saw that social and economic systems were not mutually exclusive, that the one had an influence on the other and he demonstrated this by collecting facts on the distribution of wealth in different countries.

At the conclusion of his study he was able to show that the social system (in this study the people) had a constant relationship with the economic system (in this study, the wealth). The constancy and international background were very significant. He was able to demonstrate **from facts** not opinions or impressions, that 20% of the population owned 80% of the wealth; so faithfully was this ratio reproduced in different countries, he was able to predict that future wealth distribution would remain in the region of 20:80 i.e. a few would continue to own most of the wealth whatever the democratic or autocratic setting.

In chemistry when mixing different chemicals a predicted result can be forecast and, given the same chemicals and the same proportional mix, the same result can be obtained repeatedly. In Pareto's day, the ability to predict an inexact science was revolutionary. Have his predictions stood the test of time? Certainly in the current economic climate when so many news bulletins have a reference to the national and international currency levels and where the income of 'Mr Average' is juxtaposed with the latest salaries of the judges and other top executives, this statement of a few owning most of the wealth may not be as surprising as it was in the middle of the last century.

To be able to predict the outcome of a situation given certain facts is something we all do every day. In a hospital setting the duration of an operating list is based on facts collected from previous similar operations; albeit, some unforeseen difficulties may arise which lengthen the operating time but generally this method of predicting how long an operating list will run, continues to be used. Another prediction used daily in a hospital, is the one of bed occupancy - how many discharges are predicted for a certain day leading on to how many admissions can be accepted.

Another way of looking at Pareto's findings is to say that the few owned most of the wealth and this is of use when looking at a list of problems. **Is it worth time and energy trying to solve all problems or should one concentrate on the few?** This approach was well illustrated in a TV documentary concerning burglaries in London. One district was able to demonstrate that it was a waste of time and manpower to investigate **every** burglary. They were able to prove that where a burglary took place and there were certain clues at the scene of the crime, it was well

worth following up these incidents and the results produced a high conviction rate. However, the majority of burglaries, where there were none or very few clues at the scene of the crime, were not worth following through other than with an initial cursory investigation. The programme presenter clarified that time and resources are not unlimited in the Metropolitan Police and therefore having set certain criteria to 'select' those burglaries to be investigated, the success rate for convictions was significantly high. Nothing here about 20% of burglaries being investigated, it might be 25% or 40% or whatever - what is being said is that in some instances concentrating resources on a few might be better use of resources than trying to cope with the total. Indeed in the same documentary, there was another district which had done just that, it had tried to treat all burglaries as the same with no criteria for selecting out those which had a high probability of conviction. The total result was a much lower conviction rate than the first district.

What use can Quality Circles make of this information? It is suggested that in some instances if time and energy are focused on the important problems - arrived at by a group process of brainstorming and priority listing - then there is a higher probability of solving the problem. Also, in solving 'the few' problems some of 'the many' might also be eliminated. In the Health Service this concept of being able to separate the important few from the trivial many may be used when faced with a list of problems i.e. manpower and resources can be directed on the important few, thereby making optimum use of resources.

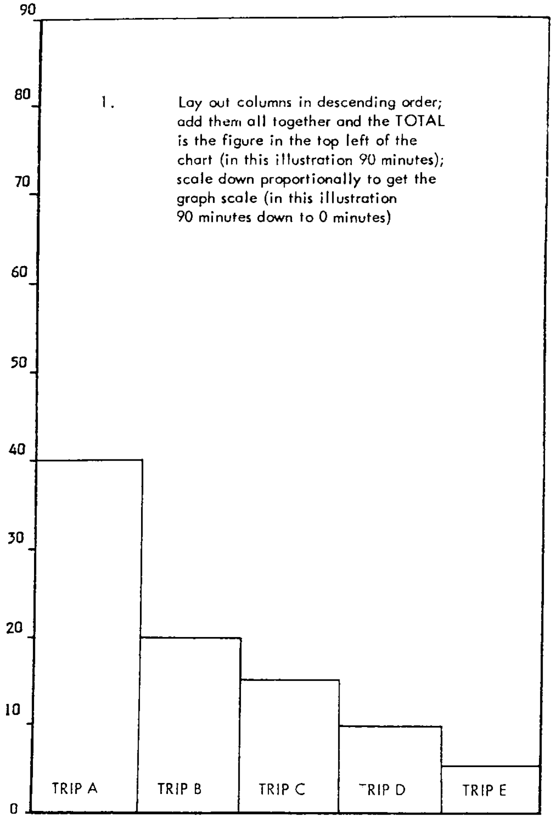
A Pareto Chart is also of use to a Quality Circle when there is a need to:

- illustrate degrees of importance.

- give a simple illustration of percentages.

- show changes or improvements.

PARETO CHART

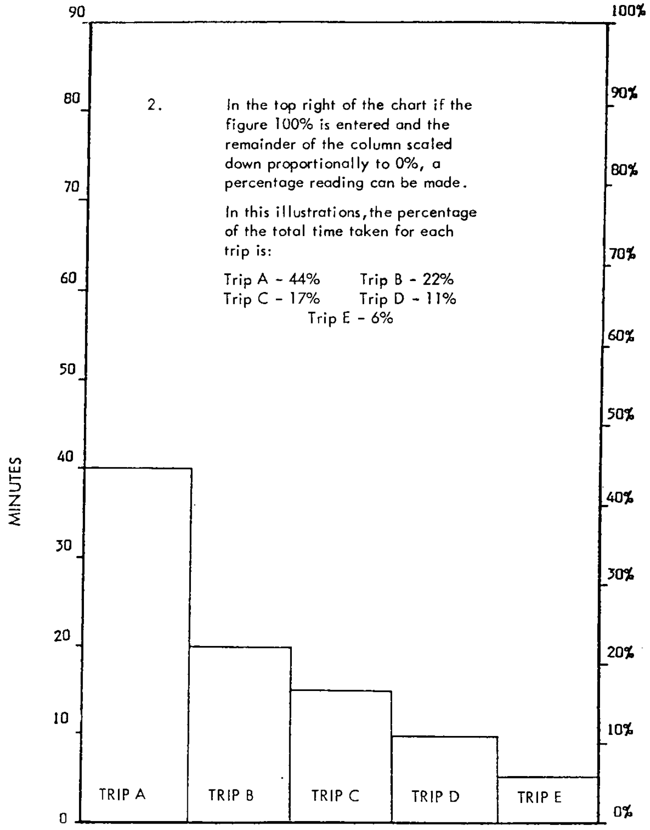


1. Lay out columns in descending order; add them all together and the TOTAL is the figure in the top left of the chart (in this illustration 90 minutes); scale down proportionally to get the graph scale (in this illustration 90 minutes down to 0 minutes)

e.g. Five marked strips of paper from a box of 50 strips would produce a 10% sample. Therefore in a day, the above illustration might be the 10% result of time taken by portering staff to complete trips.

A Quality Circle group would concentrate on the longer trips to investigate if there were any causes which could be reduced or eliminated.

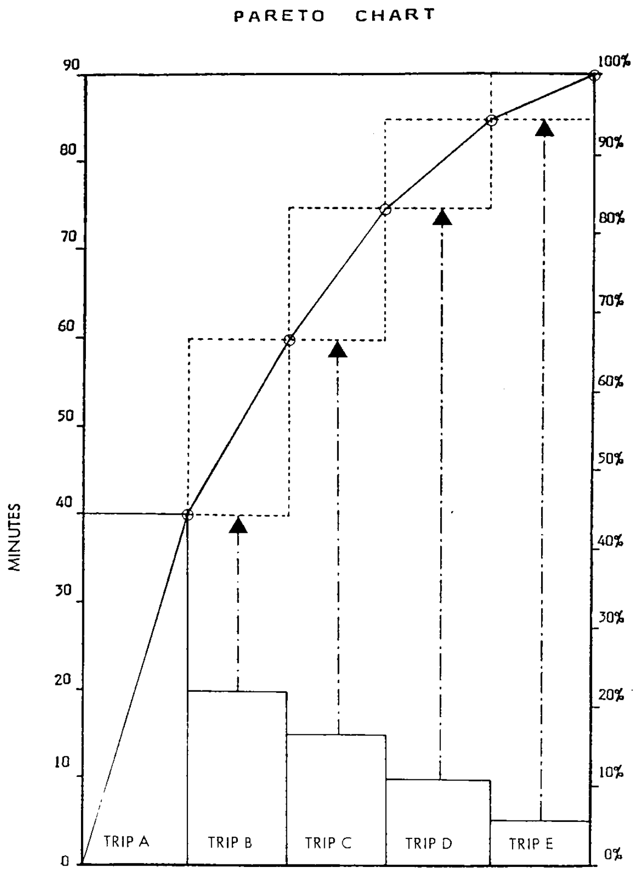
PARETO CHART



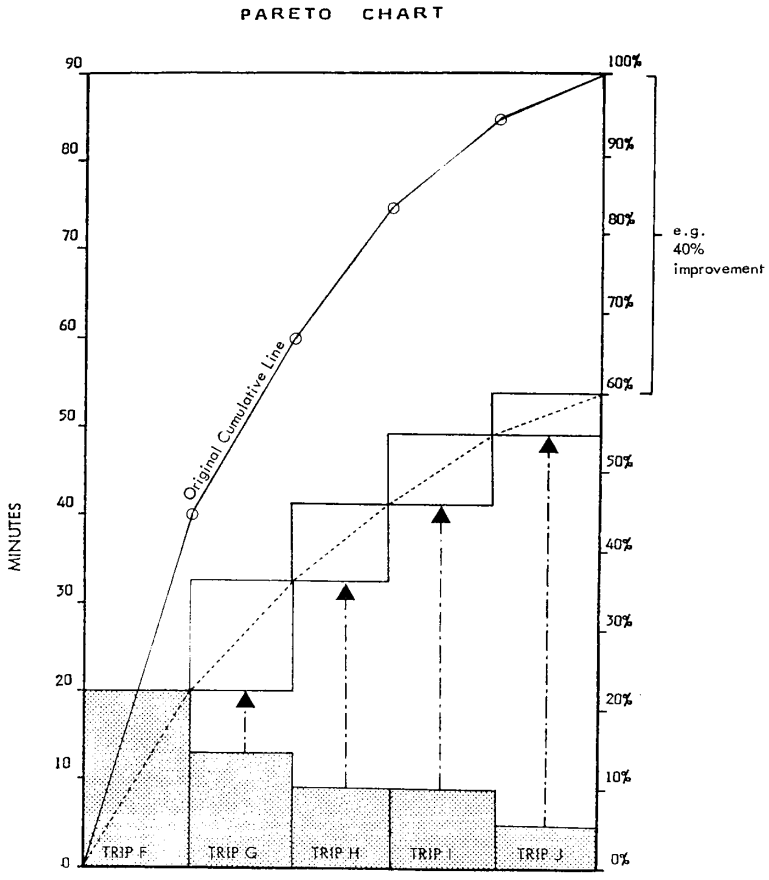
2. In the top right of the chart if the figure 100% is entered and the remainder of the column scaled down proportionally to 0%, a percentage reading can be made.

In this illustrations, the percentage of the total time taken for each trip is:

Trip A - 44% Trip B - 22%
Trip C - 17% Trip D - 11%
Trip E - 6%



3 By drawing each solid column diagonally one on top of the other, illustrated as broken line columns, a line can then be drawn joining the top right point of each column – this becomes the CUMULATIVE LINE.



4 In the imaginary example – after some of the causes for the lengthy journeys have been reduced or eliminated, another random sample might be carried out. The illustration shows how the percentage improvement can be easily illustrated.

6. CHARTING TECHNIQUES

AIM: To outline different methods which may be used to illustrate the results of data collection.

Introduction

Having gathered information about a particular problem, circle members will have a collection of numbers. It is now necessary to present these findings in a form which is easily understood by others. These presentations may be for use:

- at circle meetings when analysing the data
- in the written report to management
- when demonstrating points at a circle presentation

There are many different methods of presenting information and each has its own uses and limitations. In order to gain most interest and credibility the methods used must demonstrate the point clearly and correctly.

Tables

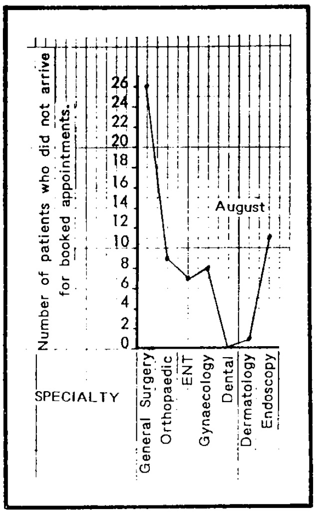
Numbers can be presented in a table. However, although all the information is there the table may not give the true significance of what is demonstrated by the data. Also it will not hold the attention of most people very long. For example:

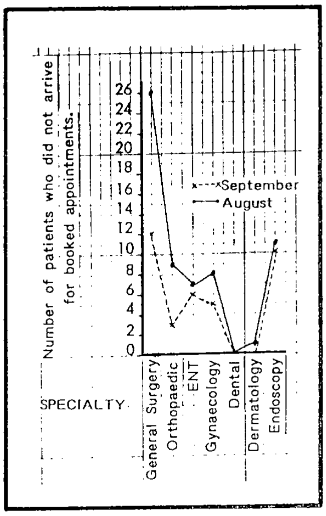
MONTH:	Aug	Sept	Oct	Nov	TOTAL
General Surgery	26	12	22	17	77
Orthopaedic	9	3	4	3	19
ENT	7	6	5	8	26
Gynaecology	8	5	4	6	23
Dental	0	0	1	0	1
Dermatology	1	0	8	13	22
Endoscopy	11	10	9	12	42
TOTAL:	62	36	53	49	200

Figure 11 Patients who did not arrive for booked appointments

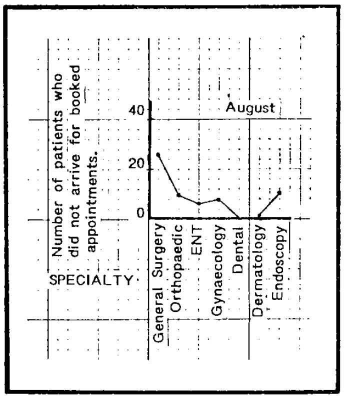
Graphs

Use of a graph may have more visual impact. Separate graphs may be drawn (e.g. Graph A) or the information added to as more data becomes available (e.g. Graph B).





Since the use of graphs depends on visual interpretation, the same data presented on graphs using different scales can show a different picture. Graph A and B show a somewhat erratic difference while the same information on Graph C tends to indicate stability.



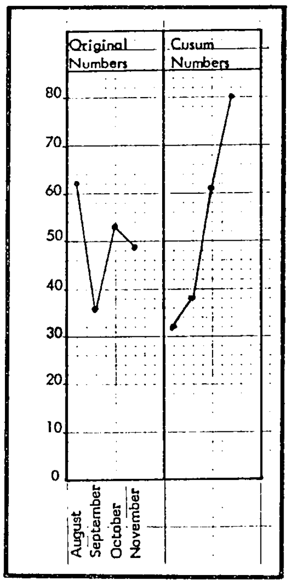
Another point is that the data illustrated in Graph B is only for two months, further additions might give a somewhat muddled picture.

Remember...

The methods used to present numeric information must demonstrate the point(s) clearly and correctly.

A graph which can be used when illustrating a trend, is a **Cusum Graph.** A trend can be described as a recognisable movement towards or away from some standard or goal. In the non-attenders example, it might be useful to illustrate a trend to show if the number of non-attenders is increasing or decreasing. One easy method for doing this is to use the theory of cumulative summing. This will magnify the scale of differences, so that a real trend will show up much earlier. the Cusum Graph will show this. The idea is to collect a set of figures and to subtract from each figure a constant value. The resulting values are cumulated - that is, each is added on in turn. the graph of these cumulated values will be quite different from a graph based on the original figures.

Number of non-attenders		**Constant values of 30 subtracted**	**Cusum Value**
August	**62**	32	32
September	**36**	6	38
October	**53**	23	61
November	**49**	19	80

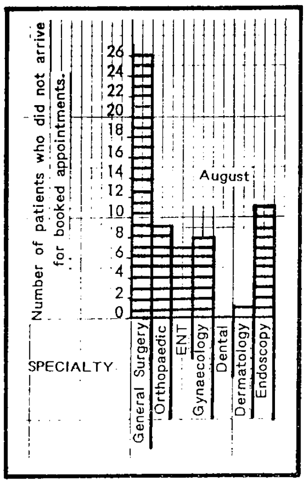


Remember...

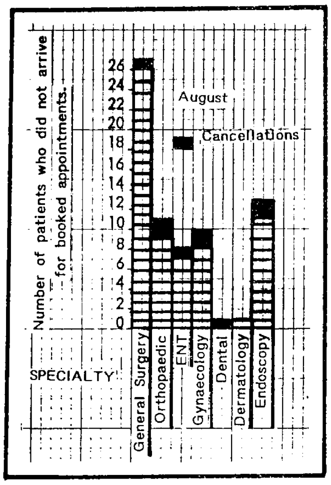
A Cusum Graph will magnify the scale of differences so that a real trend will show up much earlier.

Bar charts

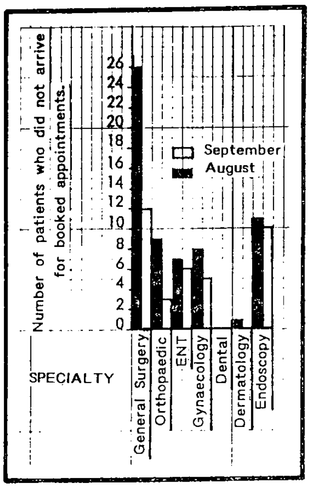
A simple bar chart is similar to a graph but bars are used instead of points on a scale. In the example for non-attenders at outpatient departments this might have been a better format to have used than a graph. For example:



Component bar charts are used when the overall height of the bar is made up from two or more resources. For example in addition to the non-attenders there might also have been a number of cancelled bookings and this could have been illustrated as:



Multiple bar charts are used when comparing one set of information against another. For example, comparing the non-attenders for the different months would have resulted in this bar chart:

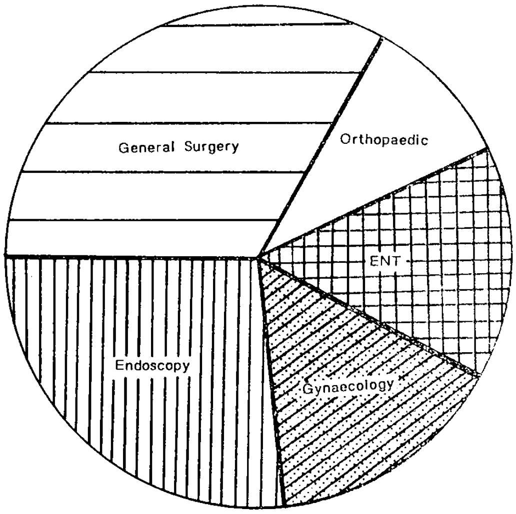


A Pie chart is simply a circle divided into sections (like slices of cake or a pie). The illustration shows how the non attenders for September could have been illustrated (obviously with colour the illustration would have even more impact.)

Total degrees in a circle = 360°
Total non-attenders for September = 36
Therefore, one non-attender = 10°

Number of patients who did not arrive for booked appointments in September:

General Surgery	**12 = 120°**
Orthopaedic	**3 = 30°**
ENT	**6 = 60°**
Gynaecology	**5 = 50°**
Endoscopy	**10 = 100°**

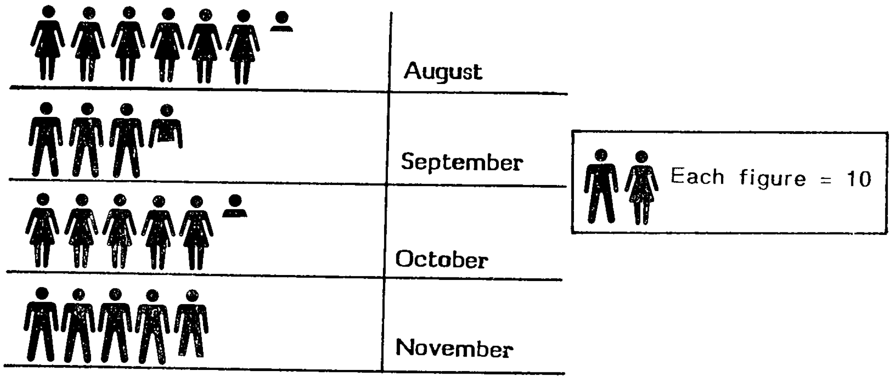


Pictogram

This is a simple method of presentation which is easily understood visually but, in some instances, may be less accurate. There are two types of pictogram:

1. The pictures are the same size and the values are indicated by the number of pictures shown, for example:

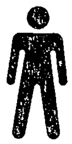
Number of patients who did not arrive for booked appointments.



2. The size of the picture is **altered proportionally** to the value it is illustrating, for example:

= 10

= 20 (i.e. it is twice the size of the first figure therefore twice the value)



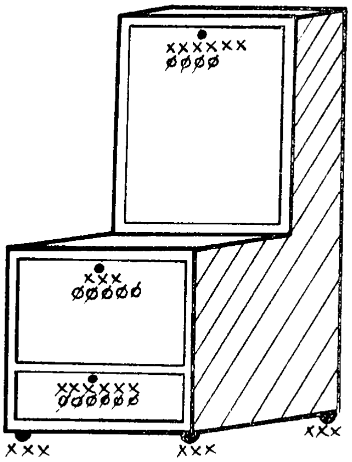
= 40 (i.e. it is four times the size of the first figure therefore four times the value)

Defects Charts

These are sometimes known as 'Measles Chart'. A diagram of the object is drawn and defects marked on it in postion. This type of illustration is usually only suitable for a simple piece of equipment. For example, a survey of problems with a bedside locker might produce the following illustration:

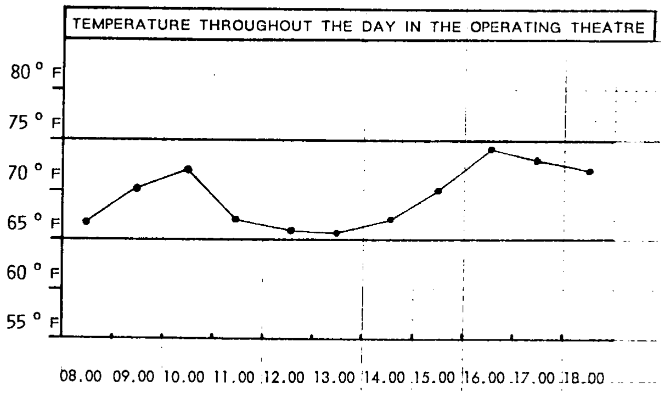
Survey of 50 people concerning problems with bedside lockers
(x and ø = 10% identified problem area)

x = sticks, difficult to move.
ø = wrong position



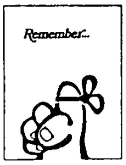
Control Chart

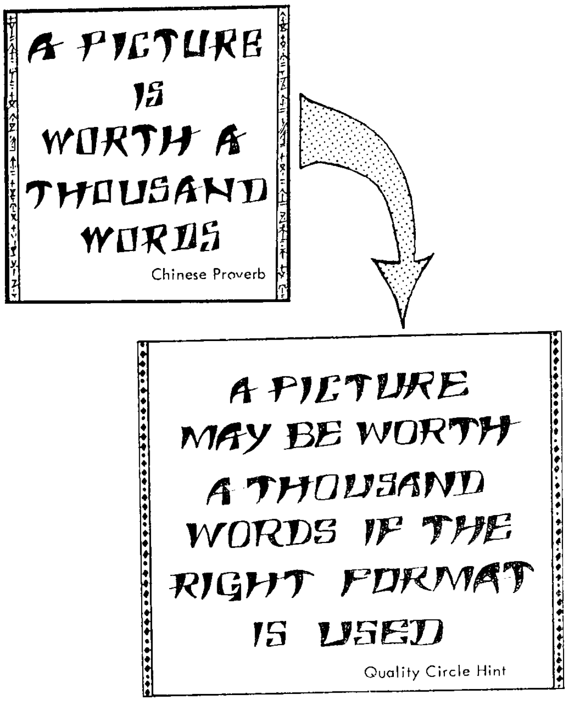
This can be used to keep a check on a problem and determine whether or not it is staying within pre-set acceptable limits. For example, the temperature in the operating theatre might be recorded as:



Summary

There are many different ways to present information and charting is one method. The examples illustrated in this Module are not finite and Quality Circle members should always seek to choose the method which has the most impact and demonstrates the point being made in the most accurate and effective manner.





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7. DOCUMENTATION

AIM: To outline how to write a concise account which reports the accomplishments of the Quality Circle.

Introduction

At this stage in the Quality Circle process, the circle members have almost finished the project. Plans should now start for producing a succinct account of what the project involved and the ensuing recommendations. The account may be for members of the Steering Group, the General Manager, Medical Staff or other appropriate groups. If the training modules have been followed, most of the information will be available in the notes of each QC meeting. (To simply staple together all the documents collected is not good enough).

A format is the first step in writing this concise account. The following is a suggested outline which can be used for most reports:

1. **Purpose of the project**
2. **Conclusions**
3. **Actions taken**
4. **Results**

The QC notes will serve as a reminder that the first meetings were held to identify problems. It was not until after the problems were identified and priorities set that the problem-solving cycle began. The purpose of the project was to reduce or eliminate a problem that was important to the circle members. In the first section **the purpose of the project** an explanation needs to be given of how the problems were identified and priorities established. It needs to be remembered that the real purpose of the project was to reduce or eliminate the problem.

The next section should describe the **conclusions** made related to the nature of the problem i.e. its causes and the need to eliminate the problem.

The third section should list and explain specific **actions taken** and data collected by the circle members; both those actions and data completed, and those incomplete.

The final section should describe the **results** obtained to-date. Any cost reductions and other improvements should also be included - this section might also include unexpected results or improvements.

It is often useful to include supporting statistics and data in a report but this information should probably be included as an appendix.

Documentation should be the easiest part of any circle project but some people dislike writing reports because they think the writing must be formal and highly technical. The report of a Quality Circle project should be clearly written with no ambiguities. Where possible specifics should be stated. For example, writing that the purpose of the project was to:

'Improve quality of patient care'

is too general. It is more precise to write:

> **The purpose of the project was to reduce the waiting time in outpatients by half in six months.**

This statement clearly says:

- **exactly which problem was to be solved**
- **how much improvement was looked for**
- **when the improvement was expected to be seen**

Sometimes it is necessary to explain **why** a particular thing was done.

WHY:

was that the purpose
was this thought to be the cause of the problem
would the solution being considered, improve the situation

An explanation of 'why' clarifies the intentions to those reading the report.

Sometimes it is necessary to explain **how** a particular thing was done.

HOW:

was the problem established to be the most important
was the information collected
was the data analysed
were the interests of other people considered

An explanation of 'how' adds value to the contents.

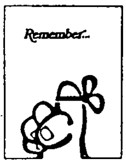
The best reports should not be too long. Two or three pages can be enough (excluding the appendices). Too often Quality Circles believe that the value of a report is measured by its weight. Long reports, even though they may provide a lot of useful information, are usually not read.

The best reports are the ones that are read by the people who receive them.

Summary

When writing a concise account which reports the accomplishments of the Quality Circle:

1. Prepare an outline
2. Wait a few days and read the draft (improvements will often be obvious only after a few days away from the draft)
3. Ask someone to review the draft
4. Have the account typed in a final form
5. Include a table of contents and a cover page
6. The cover page should show the name of the report, the name of the Health Authority, the name of the Quality Circle or department and finally, the date the report was submitted.



A written report does more than document the results of the Quality Circle project. It adds credibility to the work done and enhances the worth of the Circle. It is tangible evidence of the success of the Circle, its growth and self development.

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8: MAKING A PRESENTATION

AIM: To guide circle members in making a well conducted oral presentation which will expand upon the written report.

Introduction

The oral presentation of the written report to management or other appropriate group is the next stage in the circle project. A well conducted presentation will demonstrate the circle's success and accomplishments.

Preparation - for questions

Making an oral presentation can be difficult if quality circle members are not prepared, as this is the time that the work of the circle is likely to be challenged or questioned. This questioning should be taken constructively, even if the response appears to be negative. Circle members should understand that this means the work of the circle has been taken seriously. The circle should be prepared for questions and handle them well. Circle members should understand how others will examine the report and be prepared to provide details.

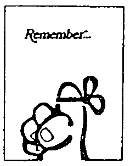
- on information sources

Critics often challenge the source of the information. They may want to know from where the data was collected and question the credibility of that data source. If **estimated** numbers are used, they may question the accuracy of the estimation. The only way to deal with this sort of criticism is to be sure, in advance, that the data is the best available in the given circumstances. Sometimes it might have been possible to have gathered more detailed information but at too high a price of both time and resources, as already stated in an earlier module '.....investigating a problem with a view to taking action to reduce or solve it, data collection is a means to that end and not the end in itself'.

Preparation (continued)

- of assumptions

Another form of criticism questions basic assumptions. Assumptions are facts taken for granted and information the group thought was obvious. To prepare for this kind of questioning the group should analyse and test any assumptions they have made. By fully understanding the assumptions, and testing them, potential questioning can be effectively dealt with.



NEVER ASSUME because you make an ASS out of U and ME

- of calculations

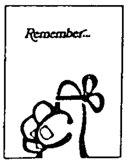
Critics will often check the calculations. Any mistakes in the calculations, no matter how small, can destroy the credibility of the entire project. Before submitting any type of report or presentation all calculations should be double checked.

- of visual aids

A presentation will have more impact if visual aids are used, these might include flip charts, overhead transparencies, photographs, posters etc. Outlines of the presentation can be prepared on a flip chart or suitable alternative aid.

Include human interest details

An oral report must have human interest as well as technical information to be successful. One or two short stories or anecdotes about something that happened during the course of the project can help to keep the interest of the audience.



An oral report does not have to cover exactly the same material as a written report, indeed it should not. Oral reports can be more general as the details are available in the written report.

Presentation

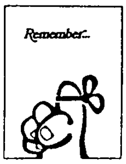
When possible, all members of the circle should be encouraged to participate in the presentation, as they have all been involved in identifying and solving the problem and all should receive recognition for this fact. The circle members will know more about the project than any of their audience, the members will be speaking from their own experiences of working on a real problem and as such will have a wealth of knowledge to share.

The presentation can be divided into three stages:

1. A brief summary of the points to be made; the contents should cover the whole of the project.

2. A systematic, logical order where each section leads to the next. If a pilot study to test the solution has been carried out then this data should be included. If a pilot study has not been carried out, suggestions for useful applications of the solution might be included.

3. A brief summary of the points made.



A well conducted oral presentation demonstrates the circle's success and accomplishments.

Summary

1. Tailor the presentation to suit the audience e.g. how might they be affected by the problem; how might they benefit from a solution to the problem.

2. Be fully prepared for questions, anticipate that some of the questions might be critical.

3. Rehearse adequately. Use prompts that individuals are happiest and most comfortable using e.g. some might prefer to speak from notes, some from overhead transparencies, some from flip charts. What should be avoided is writing out every word of the presentation and making a speech.

4. Use imagination in visual aids - the information most often remembered after a presentation is the imaginative pictures used to illustrate particular points.

5. Make sure the presentation tells a logical story.

6. Aim for a 10 - 15 minute presentation. At rehearsal a presentation of more than 15 minutes should be pared down. Clarify at the beginning if questions will be welcomed during or at the end of the presentation.

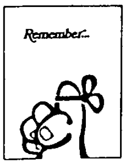
7. Speak up, speak slowly and face the audience. Facing the audience might seem an obvious position for speakers to be in but particularly when using a flip chart or overhead projector inexperienced speakers turn away from their audience (and sometimes forget to turn back!).

8. Be natural but resist informality.

9. Check papers, visual aids and equipment before a presentation.

10. Distribute handouts **after** a presentation.

(Based on guidelines produced by the National Society of Quality Circles and with their kind permission.)



Keep the presentation as simple as possible, keep the technology as simple as possible. Always choose the simple and safe in preference to the ingenious and ambitious.

Additional comments

If requested many commercial firms who, for example, produce overhead projector material, are pleased to supply booklets containing hints for making the most of overhead projectors.

Further reading

Jay, Antony. Effective presentation (BIM 1971) Available from Video Arts
Jay, Antony. Slide Rules. Video Arts Ltd. 1976 (Companion booklet to the film 'Can we please have that the right way round').

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THE ROLE OF A QUALITY CIRCLE LEADER

The circle leader is the nucleus around which the circle revolves but he or she cannot do everything. A good leader delegates tasks to members so everyone feels part of the team. A wise leader keeps in close touch with the QC facilitator.

The main tasks of the leader are:

To stimulate interest and maintain enthusiasm.

To plan for and hold regular meetings.

To ensure that the circle keeps to the guidelines.

To help train circle members and to seek opportunities for self developement and for that of circle members.

To advise the manager and facilitator of progress.

To ensure that the notes and work of the group are produced and seen by everyone who needs to be kept in touch by circulation, or notice boards.

From: Basic Circle Handbook and with kind permission of:
National Society of Quality Circles

THE ROLE OF A QUALITY CIRCLE FACILITATOR

The role of the Facilitator is to coordinate several circles to ensure they function correctly, that all members are sufficiently motivated and outside stresses are minimised, thus allowing circles to keep 'rolling'. The Facilitator should not take an active part in discussion of problems or voting but should observe the circle functioning. The Facilitator should only intervene when necessary.

The main tasks of the facilitator are:

To be link person between Circle and Steering Committee, communicating information between both parties.

To ensure Circles 'stick to the rules of the game' and function effectively, giving advice as and when necessary and directing the Circle with their current project.

To provide training for Circle members and leader, monitoring their performance, developing them further, highlighting strengths and weaknesses and giving support.

To arrange for the provision of equipment/venue to enable a circle to function properly.

To collect data outside the Circle member's remit thus enabling them to solve a problem effectively.

To take an active role in preparing the Circle to present their problem and proposed solution to management.

To make every effort to be knowledgeable of current developments within the organisation in order to avoid wasting time with problems that are going to 'disappear' (e.g. rebuilding might eliminate an access problem); or wasting time with problems that another circle is working on (i.e. duplication of effort).

On implementation of the solution the Facilitator should monitor and review the situation as appropriate.

THE ROLE OF THE STEERING COMMITTEE

The Steering Committee provides direction and support to the Quality Circles. Membership of the Committee often includes top and middle management representing major divisions in the health authority e.g. nursing, ancillary staff, support services, finance. The facilitator(s) are also members of the Committee.

In the Health Service, Quality Circles sometimes begin with one discipline e.g. nursing. In such a situation, the Steering Committee members would probably consist of Directors of Nursing Services representing each functional area, and the facilitator(s).

The direction and support the Steering Committee gives would include:

- giving clear objectives for the implementation of Quality Circles.
- stating the proposed plan for implementation.
- making certain that funding for Circles is available e.g. for stationery; for Q.C. publications; for attendance at relevant national conferences or seminars
- giving every support to the facilitator(s) both in training requirements and in responding to reports from the facilitator(s).

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Reprinted from the Quality Circle Digest PO Box 1503, Red Bluff, CA96080 - 1335, USA:

A Quality Circle process is made up of four interrelated parts,

- the members.
- the Circle leader.
- the Circle facilitator.
- the Steering Committee.

A 3 - 15 member Steering Committee may compromise of managers, top executives, a union representative and the facilitator, together they,

- formulate the overall objectives
- draw up the implementation plan
- plan the rate of expansion.

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QUALITY CIRCLE NOTES

Circle: Leader:

Date of Meeting: Time of Meeting:

Those Present:

Brief Notes:

Agreed action to be taken + if possible, time period in which action to be taken.	Circle member(s) responsible

Signature of Circle Leader: Date:

(Copies: 1 to each Circle member; 2 to the Facilitator)

MEMBERS OF THE QUALITY CIRCLE MONITORING GROUP

Inaugural meeting: 20th November 1984

Elizabeth Capper	Patient & Nursing Services Manager, Chelsea Hospital for Women.
Janet Cartwright	Nurse Specialist, Day Care Unit, Mayday Hospital, Thornton Heath
Beverley Clack	Assistant Head of Quality Assurance Project Paddington & North Kensington Health Authority
Christine Davies	Project Officer, Education and Training King's Fund Centre
Pam Johnson	Allocation and Personnel Officer St Luke's Hospital, Guildford
Maria Lorentzon	Senior Nurse Research, Brent Health Authority (to April 1986) Deputy Coordinator, Quality Assurance Project King's Fund Centre (from May 1986)
Susan Osborne	Senior Nurse Medical Unit, Brent Health Authority (to March 1986) Deputy Director of Nursing Services (Acute Area) City and Hackney Health Authority (from April 1986)
Anne Rogers	Senior Nursing Officer, New Cross Hospital London
Dinah Tedman	Senior Nursing Officer, Hither Green Hospital London
Trudy Wood	Assistant Director of Nursing Services St Mark's Hospital, London

Resigned, December 1985.

Maggies Harrison	Formerly Director of Nursing Services, St Mary's Hospital, Harrow Road, London.

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King's Fund

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