

A Color Coded Chart Filing System for a Nuclear Medicine Laboratory¹

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A color code system for recording chart information has several advantages: Records are less likely to be lost through misfiling; the assembling of groups of charts for review of procedures, diagnoses or treatment results are greatly facilitated; and teaching cases need not be removed from the central file, since they can be identified easily.

The color code system used in the Radiation Therapy Department of the Massachusetts General Hospital was described by Schulz and Wang (1). Borrowing liberally from their report, a system for nuclear medicine color filing was devised and put into effect in a large Clinical Nuclear Medicine Laboratory with satisfactory results.

This report describes the color code adopted.

FOLDERS

Tuffbac Double Pocket Folders, $9\frac{1}{2} \times 11\frac{1}{4}$ inches are used. These are obtained from the Ames Color File Corporation in Sommerville, Mass. The folders are filed vertically (Fig. 1). If necessary, they can be filed in vertical racks against a flat surface requiring only 12 inch depth, as opposed to the standard pull drawer filing cabinets which require 28 inches closed and 55 inches open.

By filing vertically, the entire length of the outer crease of the folder is available for color coding. Twenty-two numbered spaces, $\frac{1}{2}$ inch each, are printed along this outer edge. They are numbered from below up, 1 through 22, when looking at the chart in the vertical file position.

COLOR TAPE

Acetate fiber color tape, $\frac{1}{2}$ inch wide, in rolls of 72-yard length are used to color code the folders.

Of 13 available colors (sic) ten were selected for use. Red-green combinations could not be avoided so the vulnerability of this code among the color blind is obvious.

A simple tape dispenser was constructed (Fig. 2). It holds 22 rolls of tape, 2 rolls of each color, plus black. Only one roll of each color is in use at any time.

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The second is used as a spacer. A hack saw blade is mounted in front of the rolls for tape tearing.

ALLOCATION OF THE NUMBERED SPACES

The allocation of the numbered spaces on the folder edge is as follows (Fig. 3):

Spaces 20, 17, 14, 11, 8, 5 & 3: Kept blank for spacing.

Spaces 22 & 21: Last two digits of the patient's Nuclear Medicine Number. Terminal digit filing is used, thus allowing uniform rather than open end expansion. In addition, numerical rather than alphabetical filing is considered to be of advantage. All of the charts ending in the same two digits are filed together, *e.g.*, 00 11 13, 94 10 13, 65 69 13. As chart numbers increase, the charts can be arranged within their terminal digit grouping according to the middle digits. In this fashion the 94 10 13 would be filed before both 00 11, 13 and 65 69 13. A misfiled chart is easily recognized.

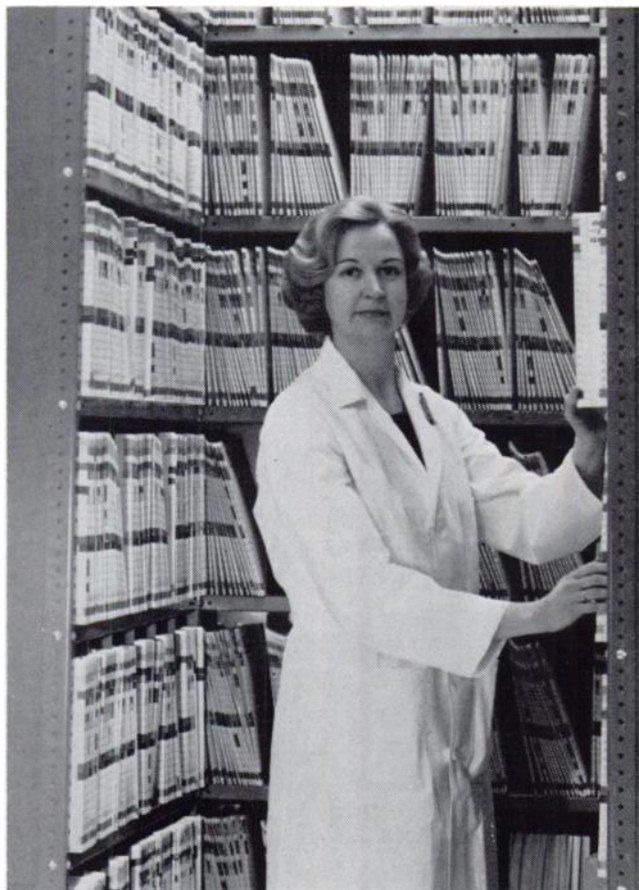


Fig. 1. Charts filed vertically in open metal shelving. The patient's identification number is color coded along the top of the charts; the diagnosis in the middle, with diagnostic procedures coded above and therapeutic data below the diagnostic band.

Spaces 19-18, 16-15 & 13-12: Nuclear Medicine Tests. Each nuclear medicine procedure is assigned a two digit number. The first digit reflecting the general system and the second digit the particular test within the system. Repeat tests are not double recorded. If more than three *different* nuclear medicine diagnostic tests are performed on a patient, a second chart is made up and the two are stapled together, back to front, at the top of the folders. In this manner pulling one chart will assure the pulling of all the records on that particular patient.

Within the particular system, all radioisotope scans are assigned the second digit 9. In this fashion, scan charts, as a group, are more easily recognized. The endocrine system is assigned the digit 0 and the thyroid scan, an endocrine scan, is therefore 09. The hematopoietic system is 1 and the spleen scan 19. The pulmonary system is 6 and the lung scan 69.

Spaces 10-9: Nuclear Medicine Diagnosis. These digits depict the diagnosis pertaining most to the nuclear medicine test or treatment. Again, the first digit relates to the system and the second to the particular clinical state within the system. 00 is endocrine euthyroid while 01 is endocrine hyperthyroid. A patient with malignant lymphoma who has a radioiodine uptake in the euthyroid range would be recorded as 00, euthyroid.

Space 7: Radionuclide used in treatment.

Space 6: Number of treatments.

Space 4: Treatment Results. Each disease state has its own treatment result card. Treatment result No. 3, in hyperthyroidism, means a hypothyroid result after 1 treatment whereas in euthyroid angina pectoris treated with radioiodine, it means a poor result.

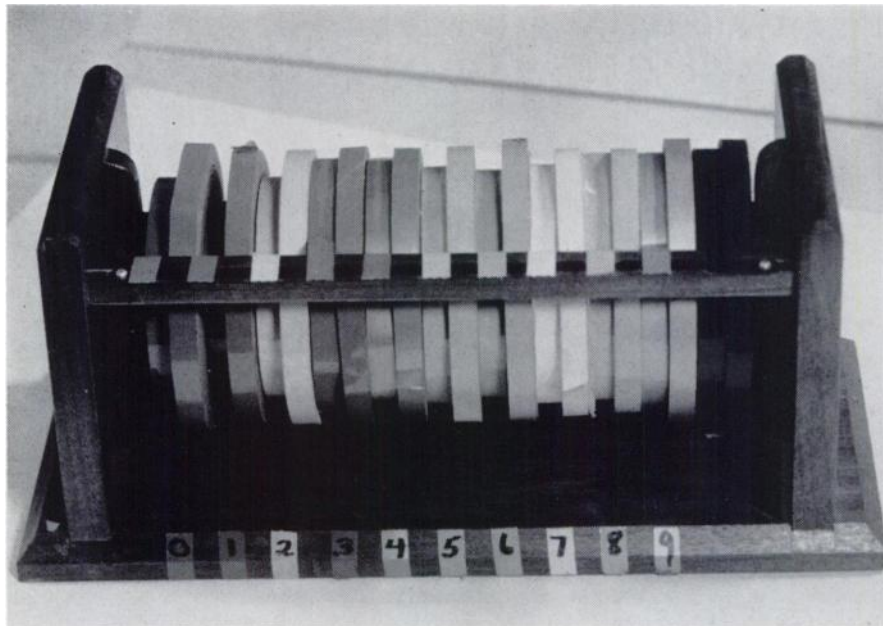


Fig. 2. Color tape dispenser showing how duplicate rolls of tape are used as spacers. This dispenser accommodate 22 one-half inch rolls of tape.

Space 2: This space is reserved for a general chart code and can be used for coding teaching cases as excellent, good, proven, etc., or can be used to further subclassify charts as desired, e.g., false-positive, false-negative. The space can also be used to distinguish chart groups for a particular clinical study.

Space 1: Last year seen. This space facilitates removal of chart to storage after 3, 4 or 5 years.

NUCLEAR MEDICINE COLOR CODE

Tests which are well established are assigned numbers in their particular system. Whenever possible tests and diagnosis of comparable parameters are grouped together so as not to fill the code and thereby compromise expansion as new tests are developed and become laboratory routine. For example, thy-

UMS #	6	19	33	63
NAME	SEVARS, BARK D.			
LAST 2 DIGITS				
Nuc. Med. #				
Space	20			
Nuc. Med. Tests	1			
	Space	17		
	2			
Space	14			
3				
Space	11			
Nuc. Med. Diagnosis				
Space	8			
Rx Nuclide				
# of Rx's				
Space	5			
Rx Result				
Space	3			
Gen. Chart Code				
Last Year Seen				

Fig. 3. Sample chart, spread open, to illustrate the space allocation. Looking at the outside of the chart in the file, and using the color code described, the following information is available without opening the chart: The patient's identification number ends with 63; a thyroid uptake, T-3 resin test and thyroid scan were performed; a diagnosis of hyperthyroidism was made; the patient received two doses of ¹³¹I and became hypothyroid; the case is coded as representing a good teaching case, proven; and the patient was last seen in 1965.

roid stimulation and suppression studies are grouped under the same diagnostic test code. The general term ferrokinetic studies covers plasma iron clearance as well as marrow counting and red blood cell activity accumulation.

Nine system groupings are devised. The tenth available group color is used to code tests under development, or assessment, which are not laboratory routine. An example of this is the parathyroid scan, currently coded 99. At such time as this procedure becomes a reliable and reproducible nuclear medicine technique, then it will be reassigned to the endocrine system with code 09 (endocrine scan) sharing this code with the thyroid scan.

The availability of a coded developmental group prevents hasty assignment of a test to the permanent file before it is adequately evaluated and thereby lessens the likelihood of changing the permanent code if a test is abandoned as unsuitable.

The development group also allows a ready haven for charts involved in active clinical research projects without these charts having to be removed from the permanent file and also without the records having to be divided up into two charts if the patient happens to have had another nuclear medicine procedure.

Number Code

0—Green	5—Light blue
1—Red	6—Light green
2—Yellow-orange	7—Yellow
3—Blue	8—Orange
4—Gold	9—Silver

System Code

0—Endocrine	5—Cardiovascular
1—Hematopoietic	6—Pulmonary
2—Genitourinary and Reproductive	7—Osseous
3—Central Nervous System	8—Integumentary and Soft Tissues
4—Gastrointestinal	9—Miscellaneous and Developmental

Test Code (Only the numbers currently assigned are listed below)

- 0—Endocrine
 - 00—*In Vivo* Thyroid Uptake
 - 01—*In Vitro* Thyroid Study
 - 02—Stimulation or Suppression Thyroid Uptake
 - 09—Thyroid Scan
- 1—Hematopoietic
 - 10—Red Cell Mass and/or Survival
 - 11—Blood and/or Plasma Volume
 - 12—Ferrokinetic Studies
 - 13—Cyanocobalamin Absorption Test (With or Without Intrinsic Factor)
 - 14—Platelet Survival
 - 15—Total Exchangeable Sodium
 - 19—Spleen Scan
- 2—Genitourinary and Reproductive
 - 20—Renogram
 - 26—Placental Localization
 - 29—Renal Scan
- 3—Central Nervous System
 - 39—Brain Scan

- 4—Gastrointestinal
 - 40—Fat Absorption and Balance Study
 - 41—Protein Balance Study
 - 49—Liver Scan, Pancreas Scan
- 5—Cardiovascular
 - 50—Radiocardiogram
 - 51—Shunt Detection Study
 - 59—Heart Blood Pool Scan, Myocardial Scan, Aneurysm Scan
- 6—Pulmonary
 - 60—Radiopulmonogram
 - 69—Lung Scan (Perfusion or Inhalatory)
- 7—Osseous
 - 70—Calcium Absorption and Balance Studies
 - 79—Bone Scan
- 8—Integumentary and Soft Tissues
 - 89—Eye Scan, Soft Tissue Tumor Scan
- 9—Miscellaneous and Developmental
 - 99—Parathyroid Scan

Diagnosis Code (Only the numbers currently assigned are listed below)

- 0—Endocrine
 - 00—Euthyroid
 - 01—Hyperthyroid
 - 02—Hypothyroid (Primary or Secondary)
 - 03—Thyroiditis
 - 04—Thyroid Carcinoma
 - 05—Non-Toxic Nodular Goiter
- 1—Hematopoietic
 - 10—Normal
 - 11—Polycythemia Rubra Vera or Secondary Erythrocytosis
 - 12—Pernicious Anemia
 - 13—Hemolytic Anemia
 - 14—Aplastic Anemia
 - 15—Other Anemias (Iron Deficiency, Acute or Chronic Blood Loss, Etc.)
 - 16—Splenomegaly (Neoplastic or Non-Neoplastic)
- 2—Genitourinary and Reproductive
 - 20—Normal
 - 21—Renovascular Hypertension
 - 22—Essential Hypertension and Hypertension of Unknown Etiology
 - 23—Hypertension Associated with Pyelonephritis or Glomerulonephritis
 - 24—Congenital Renal Anomaly (Polycystic, Horseshoe, Pelvic, etc.)
 - 25—Acquired Renal Disease without Associated Hypertension
 - 26—Renal Tumor (Benign or Malignant)
 - 28—Second or Third Trimester Hemorrhage
- 3—Central Nervous System
 - 30—Normal
 - 31—Intracranial Neoplasm; Malignant (Primary or Metastatic) or Benign
 - 32—Intracranial Hematoma (Subdural, Epidural or Intracerebral) Encephalomalacia
Secondary to Thrombosis or Embolus (Ischemia or Infarct) or Secondary to Trauma
(Contusion)
 - 33—Intracranial Infection (Abscess or Meningitis)
 - 34—Congenital Anomaly (Arteriovenous Malformations, Sturge-Weber, Etc.)
 - 35—Miscellaneous CNS Abnormality
- 4—Gastrointestinal
 - 40—Normal

- 41—Malabsorption Secondary to Intestinal Disease
- 42—Liver (Neoplastic)
- 43—Liver (Non-Neoplastic)
- 44—Pancreas (Neoplastic)
- 45—Pancreas (Non-Neoplastic)
- 46—Protein Losing Enteropathy (Menetriere, Gordon, Villous Adenoma, Etc.)
- 47—Malignant Peritoneal Effusion
- 5—Cardiovascular
 - 50—Normal
 - 51—Pericardial Effusion
 - 52—Cardiomegaly
 - 53—Myocardial Infarct
 - 54—Shunt (L→R or R→L)
 - 55—Acquired Cardiovascular Disease
- 6—Pulmonary
 - 60—Normal
 - 61—Pulmonary Embolus
 - 62—Neoplasm (Primary or Metastatic)
 - 63—Localized Disease Destroying or Replacing Pulmonary Tissue (Bleb, Abscess, etc.)
 - 64—Pulmonary Arterial Compression from Extrinsic Pressure
 - 65—Diffuse Pulmonary Disease, Congenital
 - 66—Diffuse Pulmonary Disease, Acquired
 - 67—Pneumonitis and/or Atelectasis (Without Abscess)
 - 68—Malignant Pleural Effusion
- 7—Osseous
 - 70—Normal
 - 71—Osteoporosis
 - 72—Osteomalacia
 - 73—Osteonecrosis and/or Fracture
 - 74—Osteitis Deformans
 - 75—Miscellaneous Congenital
 - 76—Miscellaneous Acquired
 - 77—Malignant Bone Disease, Primary or Metastatic
- 8—Integumentary and Soft Tissues
 - 80—Normal
 - 81—Soft Tissue, Inflammatory
 - 82—Soft Tissue, Neoplastic
 - 83—Miscellaneous Soft Tissue, Congenital
 - 84—Miscellaneous Soft Tissue, Acquired
- 9—Miscellaneous and Developmental
 - 90—Normal
 - 91—Hyperparathyroid, Primary or Secondary

Isotope Treatment Code

- 0—¹³¹I
- 1—³²P
- 2—¹⁹⁸Au

Number of Treatments Code

Same as chart numbering code

Treatment Result Code

- Hyperthyroid**
- 0—Euthyroid After 1 Treatment
- 1—Euthyroid After 2 Treatments

- 2—Euthyroid After 3 or More Treatments
- 3—Hypothyroid After One Treatment
- 4—Hypothyroid After Two Treatments
- 5—Hypothyroid After Three or More Treatments Incomplete (Black)
- ¹³¹I—Thyrocardiac, Angina Pectoris, Congestive Failure
- ³²P or ¹⁹⁸Au—Malignant Effusion (Pleural or Peritoneal)

Metastatic Bone Disease

- | | |
|-------------|--------|
| 0—Excellent | 2—Fair |
| 1—Good | 3—Poor |

³²P—Erythrocytosis, Primary or Secondary

- | Initial Treatment | Retreatment |
|----------------------|----------------------|
| 0—Excellent | 4—Excellent |
| Response >12 months | Response >12 months |
| 1—Good | 5—Good |
| Response 6-12 months | Response 6-12 months |
| 2—Fair | 6—Fair |
| Response 3-6 months | Response 3-6 months |
| 3—Poor | 7—Poor |
| Response—none | Response—none |

Incomplete (Black)

General Chart Code

- 0—Excellent Teaching Case—Proven
- 1—Excellent Teaching Case—Probable
- 2—Good Teaching Case—Proven
- 3—Good Teaching Case—Probable

Follow-up Code (Last Year Seen)

- | | |
|--------|--------|
| 0—1960 | 5—1965 |
| 1—1961 | 6—1966 |
| 2—1962 | 7—1967 |
| 3—1963 | 8—1968 |
| 4—1964 | 9—1969 |

Deceased (Black)

SUMMARY

A color code system for coding and filing charts in a Nuclear Medicine Laboratory is described.

REFERENCE

1. SCHULZ, M. D. AND WANG, C. C.: A Simple Method of Follow-Up, Disease Indexing, and Filing of Radiation Therapy Records, *Radiology* 79:842, 1962.